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## Appendix D Air Quality Data

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**URBEMIS 2002—Proposed Project**

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URBEMIS 2002 For Windows 7.5.0

File Name: P:\Projects - All Users\10800-00+\10953-00 Lake Forest Opportunities Study EIR\EIR\A  
Project Name: City of Lake Forest EIR - Proposed Project Operational Emissions (Site 1)  
Project Location: South Coast Air Basin (Los Angeles area)  
On-Road Motor Vehicle Emissions Based on EMFAC2002 version 2.2

SUMMARY REPORT  
(Pounds/Day - Summer)

AREA SOURCE EMISSION ESTIMATES

	ROG	NOx	CO	SO2	PM10
TOTALS (lbs/day,unmitigated)	141.46	28.32	25.10	0.34	0.08

OPERATIONAL (VEHICLE) EMISSION ESTIMATES

	ROG	NOx	CO	SO2	PM10
TOTALS (lbs/day,unmitigated)	47.76	44.48	476.47	1.41	268.68

SUM OF AREA AND OPERATIONAL EMISSION ESTIMATES

	ROG	NOx	CO	SO2	PM10
TOTALS (lbs/day,unmitigated)	189.23	72.80	501.57	1.74	268.76

URBEMIS 2002 For Windows 7.5.0

File Name: P:\Projects - All Users\10800-00+\10953-00 Lake Forest Opportunities Study EIR\EIR\A  
Project Name: City of Lake Forest EIR - Proposed Project Operational Emissions (Site 1)  
Project Location: South Coast Air Basin (Los Angeles area)  
On-Road Motor Vehicle Emissions Based on EMFAC2002 version 2.2

SUMMARY REPORT  
(Pounds/Day - Winter)

AREA SOURCE EMISSION ESTIMATES

	ROG	NOx	CO	SO2	PM10
TOTALS (lbs/day,unmitigated)	139.88	28.16	11.92	0.00	0.05

OPERATIONAL (VEHICLE) EMISSION ESTIMATES

	ROG	NOx	CO	SO2	PM10
TOTALS (lbs/day,unmitigated)	49.12	57.77	527.61	1.30	268.68

SUM OF AREA AND OPERATIONAL EMISSION ESTIMATES

	ROG	NOx	CO	SO2	PM10
TOTALS (lbs/day,unmitigated)	189.00	85.93	539.53	1.30	268.73

URBEMIS 2002 For Windows 7.5.0

File Name: P:\Projects - All Users\10800-00+\10953-00 Lake Forest Opportunities Study EIR\EIR\A  
Project Name: City of Lake Forest EIR - Proposed Project Operational Emissions (Site 1)  
Project Location: South Coast Air Basin (Los Angeles area)  
On-Road Motor Vehicle Emissions Based on EMFAC2002 version 2.2

SUMMARY REPORT  
(Tons/Year)

AREA SOURCE EMISSION ESTIMATES

	ROG	NOx	CO	SO2	PM10
TOTALS (tpy, unmitigated)	25.67	5.15	3.36	0.03	0.01

OPERATIONAL (VEHICLE) EMISSION ESTIMATES

	ROG	NOx	CO	SO2	PM10
TOTALS (tpy, unmitigated)	8.80	8.93	90.07	0.25	49.03

SUM OF AREA AND OPERATIONAL EMISSION ESTIMATES

	ROG	NOx	CO	SO2	PM10
TOTALS (tpy, unmitigated)	34.47	14.08	93.43	0.28	49.05

URBEMIS 2002 For Windows 7.5.0

File Name: P:\Projects - All Users\10800-00+\10953-00 Lake Forest Opportunities Study EIR\EIR\A  
Project Name: City of Lake Forest EIR - Proposed Project Operational Emissions (Site 1)  
Project Location: South Coast Air Basin (Los Angeles area)  
On-Road Motor Vehicle Emissions Based on EMFAC2002 version 2.2

DETAIL REPORT  
(Pounds/Day - Winter)

AREA SOURCE EMISSION ESTIMATES (Winter Pounds per Day, Unmitigated)						
Source	ROG	NOx	CO	SO2	PM10	
Natural Gas	2.16	28.16	11.92	-	0.05	
Wood Stoves	0.00	0.00	0.00	0.00	0.00	
Fireplaces	0.00	0.00	0.00	0.00	0.00	
Landscaping - No winter emissions						
Consumer Prdcts	137.72	-	-	-	-	
TOTALS (lbs/day, unmitigated)	139.88	28.16	11.92	0.00	0.05	

UNMITIGATED OPERATIONAL EMISSIONS

	ROG	NOx	CO	SO2	PM10
Single family housing	14.48	16.72	154.53	0.38	77.98
Apartments low rise	5.58	6.38	58.94	0.15	29.74
Condo/townhouse general	11.92	13.47	124.51	0.31	62.83
City park	1.98	2.45	21.90	0.05	11.24
Free-standing discount st	10.18	12.58	112.56	0.27	57.58
Office park	4.99	6.17	55.18	0.14	29.32
<b>TOTAL EMISSIONS (lbs/day)</b>	<b>49.12</b>	<b>57.77</b>	<b>527.61</b>	<b>1.30</b>	<b>268.68</b>

Does not include correction for passby trips.  
 Does not include double counting adjustment for internal trips.

OPERATIONAL (Vehicle) EMISSION ESTIMATES

Analysis Year: 2030 Temperature (F): 50 Season: Winter

EMFAC Version: EMFAC2002 (9/2002)

Summary of Land Uses:

Unit Type	Trip Rate	Size	Total Trips
Single family housing	8.70 trips / dwelling units	889.00	7,734.30
Apartments low rise	5.90 trips / dwelling units	500.00	2,950.00
Condo/townhouse general	4.37 trips / dwelling units	1,426.00	6,231.62
City park	50.00 trips / acres	26.00	1,300.00
Free-standing discount st	56.94 trips / 1000 sq. ft.	120.00	6,832.80
Office park	12.47 trips / 1000 sq. ft.	200.00	2,494.00

Vehicle Assumptions:

Fleet Mix:

Vehicle Type	Percent Type	Non-Catalyst	Catalyst	Diesel
Light Auto	58.00	0.00	100.00	0.00
Light Truck < 3,750 lbs	17.57	0.00	100.00	0.00
Light Truck 3,751- 5,750	18.45	0.00	100.00	0.00
Med Truck 5,751- 8,500	0.81	0.00	100.00	0.00
Lite-Heavy 8,501-10,000	0.11	0.00	80.00	20.00
Lite-Heavy 10,001-14,000	0.03	0.00	66.70	33.30
Med-Heavy 14,001-33,000	0.10	0.00	22.20	77.80
Heavy-Heavy 33,001-60,000	0.07	0.00	0.00	100.00
Line Haul > 60,000 lbs	0.00	0.00	0.00	100.00
Urban Bus	0.22	0.00	50.00	50.00
Motorcycle	1.66	33.30	66.70	0.00
School Bus	0.11	0.00	0.00	100.00
Motor Home	2.87	0.00	92.30	7.70

Travel Conditions

	Residential			Commercial		
	Home-Work	Home-Shop	Home-Other	Commute	Non-Work	Customer
Urban Trip Length (miles)	11.5	4.9	6.0	10.3	5.5	5.5
Rural Trip Length (miles)	11.5	4.9	6.0	10.3	5.5	5.5
Trip Speeds (mph)	35.0	40.0	40.0	40.0	40.0	40.0
% of Trips - Residential	20.0	37.0	43.0			

% of Trips - Commercial (by land use)

City park	5.0	2.5	92.5
Free-standing discount store	2.0	1.0	97.0
Office park	48.0	24.0	28.0

Changes made to the default values for Land Use Trip Percentages

Changes made to the default values for Area

The wood stove option switch changed from on to off.  
The fireplace option switch changed from on to off.

Changes made to the default values for Operations

The light auto percentage changed from 52.5 to 58.0.  
The light truck < 3750 lbs percentage changed from 15.9 to 17.57.  
The light truck 3751-5750 percentage changed from 16.7 to 18.45.  
The med truck 5751-8500 percentage changed from 7.6 to 0.81.  
The lite-heavy truck 8501-10000 percentage changed from 1.0 to 0.11.  
The lite-heavy truck 10001-14000 percentage changed from 0.3 to 0.03.  
The med-heavy truck 14001-33000 percentage changed from 0.9 to 0.10.  
The heavy-heavy truck 33001-60000 percentage changed from 0.7 to 0.07.  
The urban bus percentage changed from 0.2 to 0.22.  
The motorcycle percentage changed from 1.5 to 1.66.  
The school bus percentage changed from 0.1 to 0.11.  
The motorhome percentage changed from 2.6 to 2.87.  
The operational emission year changed from 2004 to 2030.  
The operational winter selection item changed from 3 to 2.  
The operational summer temperature changed from 90 to 75.  
The operational summer selection item changed from 8 to 5.  
The double counting internal work trip limit changed from to 1398.776.  
The double counting shopping trip limit changed from to 699.388.  
The double counting other trip limit changed from to 7273.8456.  
The travel mode environment settings changed from both to: none

URBEMIS 2002 For Windows 7.5.0

File Name: P:\Projects - All Users\10800-00+\10953-00 Lake Forest Opportunities Study EIR\EIR\A  
Project Name: City of Lake Forest EIR - Proposed Project Operational Emissions (Site 1)  
Project Location: South Coast Air Basin (Los Angeles area)  
On-Road Motor Vehicle Emissions Based on EMFAC2002 version 2.2

DETAIL REPORT  
(Pounds/Day - Summer)

AREA SOURCE EMISSION ESTIMATES (Summer Pounds per Day, Unmitigated)					
Source	ROG	NOx	CO	SO2	PM10
Natural Gas	2.16	28.16	11.92	-	0.05
Wood Stoves - No summer emissions					
Fireplaces - No summer emissions					
Landscaping	1.58	0.17	13.18	0.34	0.03
Consumer Prdcts	137.72	-	-	-	-
TOTALS (lbs/day, unmitigated)	141.46	28.32	25.10	0.34	0.08

UNMITIGATED OPERATIONAL EMISSIONS

	ROG	NOx	CO	SO2	PM10
Single family housing	14.00	12.87	140.31	0.41	77.98
Apartments low rise	5.73	4.91	53.52	0.16	29.74
Condo/townhouse general	13.01	10.37	113.05	0.33	62.83
City park	1.70	1.89	19.39	0.06	11.24
Free-standing discount st	8.73	9.71	99.32	0.30	57.58
Office park	4.58	4.74	50.89	0.15	29.32
<b>TOTAL EMISSIONS (lbs/day)</b>	<b>47.76</b>	<b>44.48</b>	<b>476.47</b>	<b>1.41</b>	<b>268.68</b>

Does not include correction for passby trips.  
 Does not include double counting adjustment for internal trips.

OPERATIONAL (Vehicle) EMISSION ESTIMATES

Analysis Year: 2030 Temperature (F): 75 Season: Summer

EMFAC Version: EMFAC2002 (9/2002)

Summary of Land Uses:

Unit Type	Trip Rate	Size	Total Trips
Single family housing	8.70 trips / dwelling units	889.00	7,734.30
Apartments low rise	5.90 trips / dwelling units	500.00	2,950.00
Condo/townhouse general	4.37 trips / dwelling units	1,426.00	6,231.62
City park	50.00 trips / acres	26.00	1,300.00
Free-standing discount st	56.94 trips / 1000 sq. ft.	120.00	6,832.80
Office park	12.47 trips / 1000 sq. ft.	200.00	2,494.00

Vehicle Assumptions:

Fleet Mix:

Vehicle Type	Percent Type	Non-Catalyst	Catalyst	Diesel
Light Auto	58.00	0.00	100.00	0.00
Light Truck < 3,750 lbs	17.57	0.00	100.00	0.00
Light Truck 3,751- 5,750	18.45	0.00	100.00	0.00
Med Truck 5,751- 8,500	0.81	0.00	100.00	0.00
Lite-Heavy 8,501-10,000	0.11	0.00	80.00	20.00
Lite-Heavy 10,001-14,000	0.03	0.00	66.70	33.30
Med-Heavy 14,001-33,000	0.10	0.00	22.20	77.80
Heavy-Heavy 33,001-60,000	0.07	0.00	0.00	100.00
Line Haul > 60,000 lbs	0.00	0.00	0.00	100.00
Urban Bus	0.22	0.00	50.00	50.00
Motorcycle	1.66	33.30	66.70	0.00
School Bus	0.11	0.00	0.00	100.00
Motor Home	2.87	0.00	92.30	7.70

Travel Conditions

	Residential			Commercial		
	Home-Work	Home-Shop	Home-Other	Commute	Non-Work	Customer
Urban Trip Length (miles)	11.5	4.9	6.0	10.3	5.5	5.5
Rural Trip Length (miles)	11.5	4.9	6.0	10.3	5.5	5.5
Trip Speeds (mph)	35.0	40.0	40.0	40.0	40.0	40.0
% of Trips - Residential	20.0	37.0	43.0			

% of Trips - Commercial (by land use)

City park	5.0	2.5	92.5
Free-standing discount store	2.0	1.0	97.0
Office park	48.0	24.0	28.0

Changes made to the default values for Land Use Trip Percentages

Changes made to the default values for Area

The wood stove option switch changed from on to off.  
The fireplace option switch changed from on to off.

Changes made to the default values for Operations

The light auto percentage changed from 52.5 to 58.0.  
The light truck < 3750 lbs percentage changed from 15.9 to 17.57.  
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The med truck 5751-8500 percentage changed from 7.6 to 0.81.  
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The lite-heavy truck 10001-14000 percentage changed from 0.3 to 0.03.  
The med-heavy truck 14001-33000 percentage changed from 0.9 to 0.10.  
The heavy-heavy truck 33001-60000 percentage changed from 0.7 to 0.07.  
The urban bus percentage changed from 0.2 to 0.22.  
The motorcycle percentage changed from 1.5 to 1.66.  
The school bus percentage changed from 0.1 to 0.11.  
The motorhome percentage changed from 2.6 to 2.87.  
The operational emission year changed from 2004 to 2030.  
The operational winter selection item changed from 3 to 2.  
The operational summer temperature changed from 90 to 75.  
The operational summer selection item changed from 8 to 5.  
The double counting internal work trip limit changed from to 1398.776.  
The double counting shopping trip limit changed from to 699.388.  
The double counting other trip limit changed from to 7273.8456.  
The travel mode environment settings changed from both to: none

URBEMIS 2002 For Windows 7.5.0

File Name: P:\Projects - All Users\10800-00+\10953-00 Lake Forest Opportunities Study EIR\EIR\A  
Project Name: City of Lake Forest EIR - Proposed Project Operational Emissions (Site 1)  
Project Location: South Coast Air Basin (Los Angeles area)  
On-Road Motor Vehicle Emissions Based on EMFAC2002 version 2.2

DETAIL REPORT  
(Tons/Year)

AREA SOURCE EMISSION ESTIMATES

Source	ROG	NOx	CO	SO2	PM10
Natural Gas	0.39	5.14	2.18	-	0.01
Wood Stoves	0.00	0.00	0.00	0.00	0.00
Fireplaces	0.00	0.00	0.00	0.00	0.00
Landscaping	0.14	0.01	1.19	0.03	0.00
Consumer Prdcts	25.13	-	-	-	-
TOTALS (tpy, unmitigated)	25.67	5.15	3.36	0.03	0.01

UNMITIGATED OPERATIONAL EMISSIONS

	ROG	NOx	CO	SO2	PM10
Single family housing	2.58	2.58	26.47	0.07	14.23
Apartments low rise	1.04	0.99	10.10	0.03	5.43
Condo/townhouse general	2.31	2.08	21.33	0.06	11.47
City park	0.33	0.38	3.69	0.01	2.05
Free-standing discount st	1.68	1.95	18.93	0.05	10.51
Office park	0.86	0.95	9.55	0.03	5.35
<b>TOTAL EMISSIONS (tons/yr)</b>	<b>8.80</b>	<b>8.93</b>	<b>90.07</b>	<b>0.25</b>	<b>49.03</b>

Does not include correction for passby trips.  
 Does not include double counting adjustment for internal trips.

OPERATIONAL (Vehicle) EMISSION ESTIMATES

Analysis Year: 2030 Temperature (F): 75 Season: Annual

EMFAC Version: EMFAC2002 (9/2002)

Summary of Land Uses:

Unit Type	Trip Rate	Size	Total Trips
Single family housing	8.70 trips / dwelling units	889.00	7,734.30
Apartments low rise	5.90 trips / dwelling units	500.00	2,950.00
Condo/townhouse general	4.37 trips / dwelling units	1,426.00	6,231.62
City park	50.00 trips / acres	26.00	1,300.00
Free-standing discount st	56.94 trips / 1000 sq. ft.	120.00	6,832.80
Office park	12.47 trips / 1000 sq. ft.	200.00	2,494.00

Vehicle Assumptions:

Fleet Mix:

Vehicle Type	Percent Type	Non-Catalyst	Catalyst	Diesel
Light Auto	58.00	0.00	100.00	0.00
Light Truck < 3,750 lbs	17.57	0.00	100.00	0.00
Light Truck 3,751- 5,750	18.45	0.00	100.00	0.00
Med Truck 5,751- 8,500	0.81	0.00	100.00	0.00
Lite-Heavy 8,501-10,000	0.11	0.00	80.00	20.00
Lite-Heavy 10,001-14,000	0.03	0.00	66.70	33.30
Med-Heavy 14,001-33,000	0.10	0.00	22.20	77.80
Heavy-Heavy 33,001-60,000	0.07	0.00	0.00	100.00
Line Haul > 60,000 lbs	0.00	0.00	0.00	100.00
Urban Bus	0.22	0.00	50.00	50.00
Motorcycle	1.66	33.30	66.70	0.00
School Bus	0.11	0.00	0.00	100.00
Motor Home	2.87	0.00	92.30	7.70

Travel Conditions

	Residential			Commercial		
	Home-Work	Home-Shop	Home-Other	Commute	Non-Work	Customer
Urban Trip Length (miles)	11.5	4.9	6.0	10.3	5.5	5.5
Rural Trip Length (miles)	11.5	4.9	6.0	10.3	5.5	5.5
Trip Speeds (mph)	35.0	40.0	40.0	40.0	40.0	40.0
% of Trips - Residential	20.0	37.0	43.0			
% of Trips - Commercial (by land use)						
City park				5.0	2.5	92.5
Free-standing discount store				2.0	1.0	97.0
Office park				48.0	24.0	28.0

Changes made to the default values for Land Use Trip Percentages

Changes made to the default values for Area

The wood stove option switch changed from on to off.  
The fireplcase option switch changed from on to off.

Changes made to the default values for Operations

The light auto percentage changed from 52.5 to 58.0.  
The light truck < 3750 lbs percentage changed from 15.9 to 17.57.  
The light truck 3751-5750 percentage changed from 16.7 to 18.45.  
The med truck 5751-8500 percentage changed from 7.6 to 0.81.  
The lite-heavy truck 8501-10000 percentage changed from 1.0 to 0.11.  
The lite-heavy truck 10001-14000 percentage changed from 0.3 to 0.03.  
The med-heavy truck 14001-33000 percentage changed from 0.9 to 0.10.  
The heavy-heavy truck 33001-60000 percentage changed from 0.7 to 0.07.  
The urban bus percentage changed from 0.2 to 0.22.  
The motorcycle percentage changed from 1.5 to 1.66.  
The school bus percentage changed from 0.1 to 0.11.  
The motorhome percentage changed from 2.6 to 2.87.  
The operational emission year changed from 2004 to 2030.  
The operational winter selection item changed from 3 to 2.  
The operational summer temperature changed from 90 to 75.  
The operational summer selection item changed from 8 to 5.  
The double counting internal work trip limit changed from to 1398.776.  
The double counting shopping trip limit changed from to 699.388.  
The double counting other trip limit changed from to 7273.8456.  
The travel mode environment settings changed from both to: none

**EXPLANATION OF CHANGES MADE TO DEFAULT SETTINGS IN URBEMIS 2002**

**Project Number:** 10953-00

**Project Name:** City of Lake Forest Opportunities Study Program EIR - Proposed Project (Site 1)

The following pages include the printed results of the air pollutant emissions modeling for one of the land use components of the proposed project. The air emissions modeling was conducted using the URBEMIS 2002 for Windows computer program developed for the Yolo-Solano Air Quality Management District in May 2003. URBEMIS 2002 is programmed with EMFAC 2002 emission factors developed by the California Air Resources Board.

As part of this analysis, changes have been made to several of the default values programmed into URBEMIS 2002. These changes were made to more accurately reflect the nature of the proposed land use. Each of these changes are discussed below.

**Vehicle Trip Rates**

The default vehicle trip rate values were changed to be consistent with the traffic impact analysis prepared for the project.

**Vehicle Fleet Mix**

URBEMIS 2002 is programmed with the following state-wide average vehicle fleet mix:

State-Wide Vehicle Type	Total	
Automobiles	52.5%	
Light-Duty Trucks <3,750 pounds	15.9%	
Light-Duty Trucks 3,751-5,750 pounds	16.7%	
Medium-Duty Trucks 5,751-8,500 pounds	7.6%	} 10.50% Total Trucks
Light-Heavy-Duty Trucks 8,501-10,000 pounds	1.0%	
Light-Heavy-Duty Trucks 10,001-14,000 pounds	0.3%	
Medium-Heavy-Duty Trucks 14,001-33,000 pounds	0.9%	
Heavy-Heavy-Duty Trucks 33,001-60,000 pounds	0.7%	
Line-Haul Vehicles	0.0%	
Urban Buses	0.2%	
Motorcycles	1.5%	
School Buses	0.1%	
Motor Homes	2.6%	

However, this state-wide average fleet mix is not appropriate for the majority of land use analyses. The project land use assessed in this analysis is identified below along with the total percentage of trucks (medium and heavy) that are expected for this land use. The following vehicle mix was calculated based on the percentage of trucks associated with this land use. The percentage of trucks for each land use were determined from the 3rd, 4th, 5th, and 6th Editions of the ITE Trip Generation manual.

ITE Code	Project Land Use:	Truck %	ADT	Truck #
210	Single Family	0.44%	8,508	37
230	Residential Condo	0.88%	11,622	102
220	Apartment	0.88%	3,360	30
150	Warehousing	27.00%	0	0
760	Research Center	1.84%	0	0
410	Park	0.44%	41	0
170	Utilities	30.00%	0	0
770	Business Park	1.84%	2,552	47
151	Mini Warehouse	7.00%	0	0
110	General Light Industry	8.00%	0	0
815	Discount Store	2.10%	7,645	161
0			0	0
Project Totals:			33,728	377
Project Truck %:			1.12%	

Vehicle Type	Total	
Automobiles	58.00%	
Light-Duty Trucks <3,750 pounds	17.57%	
Light-Duty Trucks 3,751-5,750 pounds	18.45%	
Medium-Duty Trucks 5,751-8,500 pounds	0.81%	} 1.12% Total Trucks
Light-Heavy-Duty Trucks 8,501-10,000 pounds	0.11%	
Light-Heavy-Duty Trucks 10,001-14,000 pounds	0.03%	
Medium-Heavy-Duty Trucks 14,001-33,000 pounds	0.10%	
Heavy-Heavy-Duty Trucks 33,001-60,000 pounds	0.07%	
Line-Haul Vehicles	0.00%	
Urban Buses	0.22%	
Motorcycles	1.66%	
School Buses	0.11%	
Motor Homes	2.87%	

URBEMIS 2002 For Windows 7.5.0

File Name: P:\Projects - All Users\10800-00+\10953-00 Lake Forest Opportunities Study EIR\EIR\A  
Project Name: City of Lake Forest Opportunities Study Program EIR - Proposed Project Operational E  
Project Location: South Coast Air Basin (Los Angeles area)  
On-Road Motor Vehicle Emissions Based on EMFAC2002 version 2.2

SUMMARY REPORT  
(Pounds/Day - Summer)

AREA SOURCE EMISSION ESTIMATES

	ROG	NOx	CO	SO2	PM10
TOTALS (lbs/day,unmitigated)	57.35	12.99	13.59	0.20	0.04

OPERATIONAL (VEHICLE) EMISSION ESTIMATES

	ROG	NOx	CO	SO2	PM10
TOTALS (lbs/day,unmitigated)	30.32	29.45	276.46	0.80	140.74

SUM OF AREA AND OPERATIONAL EMISSION ESTIMATES

	ROG	NOx	CO	SO2	PM10
TOTALS (lbs/day,unmitigated)	87.68	42.43	290.05	1.00	140.78

URBEMIS 2002 For Windows 7.5.0

File Name: P:\Projects - All Users\10800-00+\10953-00 Lake Forest Opportunities Study EIR\EIR\A  
Project Name: City of Lake Forest Opportunities Study Program EIR - Proposed Project Operational E  
Project Location: South Coast Air Basin (Los Angeles area)  
On-Road Motor Vehicle Emissions Based on EMFAC2002 version 2.2

SUMMARY REPORT  
(Pounds/Day - Winter)

AREA SOURCE EMISSION ESTIMATES

	ROG	NOx	CO	SO2	PM10
TOTALS (lbs/day,unmitigated)	56.37	12.88	5.44	0.00	0.02

OPERATIONAL (VEHICLE) EMISSION ESTIMATES

	ROG	NOx	CO	SO2	PM10
TOTALS (lbs/day,unmitigated)	33.43	37.44	317.94	0.75	140.74

SUM OF AREA AND OPERATIONAL EMISSION ESTIMATES

	ROG	NOx	CO	SO2	PM10
TOTALS (lbs/day,unmitigated)	89.80	50.32	323.38	0.75	140.76

URBEMIS 2002 For Windows 7.5.0

File Name: P:\Projects - All Users\10800-00+\10953-00 Lake Forest Opportunities Study EIR\EIR\A  
Project Name: City of Lake Forest Opportunities Study Program EIR - Proposed Project Operational E  
Project Location: South Coast Air Basin (Los Angeles area)  
On-Road Motor Vehicle Emissions Based on EMFAC2002 version 2.2

SUMMARY REPORT  
(Tons/Year)

AREA SOURCE EMISSION ESTIMATES

	ROG	NOx	CO	SO2	PM10
TOTALS (tpy, unmitigated)	10.38	2.36	1.73	0.02	0.01

OPERATIONAL (VEHICLE) EMISSION ESTIMATES

	ROG	NOx	CO	SO2	PM10
TOTALS (tpy, unmitigated)	5.72	5.86	52.98	0.14	25.69

SUM OF AREA AND OPERATIONAL EMISSION ESTIMATES

	ROG	NOx	CO	SO2	PM10
TOTALS (tpy, unmitigated)	16.10	8.22	54.70	0.16	25.69

URBEMIS 2002 For Windows 7.5.0

File Name: P:\Projects - All Users\10800-00+\10953-00 Lake Forest Opportunities Study EIR\EIR\A  
Project Name: City of Lake Forest Opportunities Study Program EIR - Proposed Project Operational E  
Project Location: South Coast Air Basin (Los Angeles area)  
On-Road Motor Vehicle Emissions Based on EMFAC2002 version 2.2

DETAIL REPORT  
(Pounds/Day - Winter)

AREA SOURCE EMISSION ESTIMATES (Winter Pounds per Day, Unmitigated)					
Source	ROG	NOx	CO	SO2	PM10
Natural Gas	0.99	12.88	5.44	-	0.02
Wood Stoves	0.00	0.00	0.00	0.00	0.00
Fireplaces	0.00	0.00	0.00	0.00	0.00
Landscaping - No winter emissions					
Consumer Prdcts	55.38	-	-	-	-
TOTALS (lbs/day, unmitigated)	56.37	12.88	5.44	0.00	0.02

UNMITIGATED OPERATIONAL EMISSIONS

	ROG	NOx	CO	SO2	PM10
Single family housing	8.85	10.59	88.84	0.23	42.19
Apartments low rise	5.21	6.17	51.76	0.13	24.58
Condo/townhouse general	1.63	1.94	16.24	0.04	7.71
City park	0.72	0.87	7.15	0.02	3.31
Free-standing discount st	17.02	17.87	153.96	0.33	62.95
TOTAL EMISSIONS (lbs/day)	33.43	37.44	317.94	0.75	140.74

Includes correction for passby trips.  
Includes a double counting reduction for internal trips.

OPERATIONAL (Vehicle) EMISSION ESTIMATES

Analysis Year: 2030 Temperature (F): 50 Season: Winter

EMFAC Version: EMFAC2002 (9/2002)

Summary of Land Uses:

Unit Type	Trip Rate	Size	Total Trips
Single family housing	9.08 trips / dwelling units	525.00	4,767.00
Apartments low rise	5.96 trips / dwelling units	466.00	2,777.36
Condo/townhouse general	6.18 trips / dwelling units	141.00	871.38
City park	50.00 trips / acres	10.00	500.00
Free-standing discount st	73.89 trips / 1000 sq. ft.	178.72	13,205.62

Vehicle Assumptions:

Fleet Mix:

Vehicle Type	Percent Type	Non-Catalyst	Catalyst	Diesel
Light Auto	52.50	0.00	100.00	0.00
Light Truck < 3,750 lbs	15.90	0.00	100.00	0.00
Light Truck 3,751- 5,750	16.70	0.00	100.00	0.00
Med Truck 5,751- 8,500	7.60	0.00	100.00	0.00
Lite-Heavy 8,501-10,000	1.00	0.00	80.00	20.00
Lite-Heavy 10,001-14,000	0.30	0.00	66.70	33.30
Med-Heavy 14,001-33,000	0.90	0.00	22.20	77.80
Heavy-Heavy 33,001-60,000	0.70	0.00	0.00	100.00
Line Haul > 60,000 lbs	0.00	0.00	0.00	100.00
Urban Bus	0.20	0.00	50.00	50.00
Motorcycle	1.50	33.30	66.70	0.00
School Bus	0.10	0.00	0.00	100.00
Motor Home	2.60	0.00	92.30	7.70

Travel Conditions

	Residential			Commercial		
	Home-Work	Home-Shop	Home-Other	Commute	Non-Work	Customer
Urban Trip Length (miles)	11.5	4.9	6.0	10.3	5.5	5.5
Rural Trip Length (miles)	11.5	4.9	6.0	10.3	5.5	5.5
Trip Speeds (mph)	35.0	40.0	40.0	40.0	40.0	40.0
% of Trips - Residential	20.0	37.0	43.0			

% of Trips - Commercial (by land use)

City park	5.0	2.5	92.5
Free-standing discount store	2.0	1.0	97.0

Changes made to the default values for Land Use Trip Percentages

Changes made to the default values for Area

The wood stove option switch changed from on to off.  
The fireplace option switch changed from on to off.

Changes made to the default values for Operations

The pass by trips option switch changed from off to on.  
The operational emission year changed from 2004 to 2030.  
The operational winter selection item changed from 3 to 2.  
The operational summer temperature changed from 90 to 75.  
The operational summer selection item changed from 8 to 5.  
The double counting internal work trip limit changed from to 289.112416.  
The double counting shopping trip limit changed from to 144.556208.  
The double counting other trip limit changed from to 3618.7682.  
The travel mode environment settings changed from both to: none

URBEMIS 2002 For Windows 7.5.0

File Name: P:\Projects - All Users\10800-00+\10953-00 Lake Forest Opportunities Study EIR\EIR\A  
Project Name: City of Lake Forest Opportunities Study Program EIR - Proposed Project Operational E  
Project Location: South Coast Air Basin (Los Angeles area)  
On-Road Motor Vehicle Emissions Based on EMFAC2002 version 2.2

DETAIL REPORT  
(Pounds/Day - Summer)

AREA SOURCE EMISSION ESTIMATES (Summer Pounds per Day, Unmitigated)					
Source	ROG	NOx	CO	SO2	PM10
Natural Gas	0.99	12.88	5.44	-	0.02
Wood Stoves - No summer emissions					
Fireplaces - No summer emissions					
Landscaping	0.99	0.10	8.16	0.20	0.02
Consumer Prdcts	55.38	-	-	-	-
TOTALS (lbs/day, unmitigated)	57.35	12.99	13.59	0.20	0.04

UNMITIGATED OPERATIONAL EMISSIONS

	ROG	NOx	CO	SO2	PM10
Single family housing	8.51	8.30	80.20	0.24	42.19
Apartments low rise	5.37	4.83	46.72	0.14	24.58
Condo/townhouse general	1.67	1.52	14.66	0.04	7.71
City park	0.61	0.68	6.20	0.02	3.31
Free-standing discount st	14.16	14.12	128.68	0.36	62.95
TOTAL EMISSIONS (lbs/day)	30.32	29.45	276.46	0.80	140.74

Includes correction for passby trips.  
Includes a double counting reduction for internal trips.

OPERATIONAL (Vehicle) EMISSION ESTIMATES

Analysis Year: 2030 Temperature (F): 75 Season: Summer

EMFAC Version: EMFAC2002 (9/2002)

Summary of Land Uses:

Unit Type	Trip Rate	Size	Total Trips
Single family housing	9.08 trips / dwelling units	525.00	4,767.00
Apartments low rise	5.96 trips / dwelling units	466.00	2,777.36
Condo/townhouse general	6.18 trips / dwelling units	141.00	871.38
City park	50.00 trips / acres	10.00	500.00
Free-standing discount st	73.89 trips / 1000 sq. ft.	178.72	13,205.62

Vehicle Assumptions:

Fleet Mix:

Vehicle Type	Percent Type	Non-Catalyst	Catalyst	Diesel
Light Auto	52.50	0.00	100.00	0.00
Light Truck < 3,750 lbs	15.90	0.00	100.00	0.00
Light Truck 3,751- 5,750	16.70	0.00	100.00	0.00
Med Truck 5,751- 8,500	7.60	0.00	100.00	0.00
Lite-Heavy 8,501-10,000	1.00	0.00	80.00	20.00
Lite-Heavy 10,001-14,000	0.30	0.00	66.70	33.30
Med-Heavy 14,001-33,000	0.90	0.00	22.20	77.80
Heavy-Heavy 33,001-60,000	0.70	0.00	0.00	100.00
Line Haul > 60,000 lbs	0.00	0.00	0.00	100.00
Urban Bus	0.20	0.00	50.00	50.00
Motorcycle	1.50	33.30	66.70	0.00
School Bus	0.10	0.00	0.00	100.00
Motor Home	2.60	0.00	92.30	7.70

Travel Conditions

	Residential			Commercial		
	Home-Work	Home-Shop	Home-Other	Commute	Non-Work	Customer
Urban Trip Length (miles)	11.5	4.9	6.0	10.3	5.5	5.5
Rural Trip Length (miles)	11.5	4.9	6.0	10.3	5.5	5.5
Trip Speeds (mph)	35.0	40.0	40.0	40.0	40.0	40.0
% of Trips - Residential	20.0	37.0	43.0			

% of Trips - Commercial (by land use)

City park	5.0	2.5	92.5
Free-standing discount store	2.0	1.0	97.0

Changes made to the default values for Land Use Trip Percentages

Changes made to the default values for Area

The wood stove option switch changed from on to off.  
The fireplcase option switch changed from on to off.

Changes made to the default values for Operations

The pass by trips option switch changed from off to on.  
The operational emission year changed from 2004 to 2030.  
The operational winter selection item changed from 3 to 2.  
The operational summer temperature changed from 90 to 75.  
The operational summer selection item changed from 8 to 5.  
The double counting internal work trip limit changed from to 289.112416.  
The double counting shopping trip limit changed from to 144.556208.  
The double counting other trip limit changed from to 3618.7682.  
The travel mode environment settings changed from both to: none

URBEMIS 2002 For Windows 7.5.0

File Name: P:\Projects - All Users\10800-00+\10953-00 Lake Forest Opportunities Study EIR\EIR\A  
Project Name: City of Lake Forest Opportunities Study Program EIR - Proposed Project Operational E  
Project Location: South Coast Air Basin (Los Angeles area)  
On-Road Motor Vehicle Emissions Based on EMFAC2002 version 2.2

DETAIL REPORT  
(Tons/Year)

AREA SOURCE EMISSION ESTIMATES

Source	ROG	NOx	CO	SO2	PM10
Natural Gas	0.18	2.35	0.99	-	0.00
Wood Stoves	0.00	0.00	0.00	0.00	0.00
Fireplaces	0.00	0.00	0.00	0.00	0.00
Landscaping	0.09	0.01	0.73	0.02	0.00
Consumer Prdcts	10.11	-	-	-	-
TOTALS (tpy, unmitigated)	10.38	2.36	1.73	0.02	0.01

UNMITIGATED OPERATIONAL EMISSIONS

	ROG	NOx	CO	SO2	PM10
Single family housing	1.57	1.65	15.16	0.04	7.70
Apartments low rise	0.97	0.96	8.83	0.03	4.49
Condo/townhouse general	0.30	0.30	2.77	0.01	1.41
City park	0.12	0.14	1.19	0.00	0.60
Free-standing discount st	2.76	2.80	25.02	0.06	11.49
TOTAL EMISSIONS (tons/yr)	5.72	5.86	52.98	0.14	25.69

Includes correction for passby trips.  
Includes a double counting reduction for internal trips.

OPERATIONAL (Vehicle) EMISSION ESTIMATES

Analysis Year: 2030 Temperature (F): 75 Season: Annual

EMFAC Version: EMFAC2002 (9/2002)

Summary of Land Uses:

Unit Type	Trip Rate	Size	Total Trips
Single family housing	9.08 trips / dwelling units	525.00	4,767.00
Apartments low rise	5.96 trips / dwelling units	466.00	2,777.36
Condo/townhouse general	6.18 trips / dwelling units	141.00	871.38
City park	50.00 trips / acres	10.00	500.00
Free-standing discount st	73.89 trips / 1000 sq. ft.	178.72	13,205.62

Vehicle Assumptions:

Fleet Mix:

Vehicle Type	Percent Type	Non-Catalyst	Catalyst	Diesel
Light Auto	52.50	0.00	100.00	0.00
Light Truck < 3,750 lbs	15.90	0.00	100.00	0.00
Light Truck 3,751- 5,750	16.70	0.00	100.00	0.00
Med Truck 5,751- 8,500	7.60	0.00	100.00	0.00
Lite-Heavy 8,501-10,000	1.00	0.00	80.00	20.00
Lite-Heavy 10,001-14,000	0.30	0.00	66.70	33.30
Med-Heavy 14,001-33,000	0.90	0.00	22.20	77.80
Heavy-Heavy 33,001-60,000	0.70	0.00	0.00	100.00
Line Haul > 60,000 lbs	0.00	0.00	0.00	100.00
Urban Bus	0.20	0.00	50.00	50.00
Motorcycle	1.50	33.30	66.70	0.00
School Bus	0.10	0.00	0.00	100.00
Motor Home	2.60	0.00	92.30	7.70

Travel Conditions

	Residential			Commercial		
	Home-Work	Home-Shop	Home-Other	Commute	Non-Work	Customer
Urban Trip Length (miles)	11.5	4.9	6.0	10.3	5.5	5.5
Rural Trip Length (miles)	11.5	4.9	6.0	10.3	5.5	5.5
Trip Speeds (mph)	35.0	40.0	40.0	40.0	40.0	40.0
% of Trips - Residential	20.0	37.0	43.0			

% of Trips - Commercial (by land use)

City park	5.0	2.5	92.5
Free-standing discount store	2.0	1.0	97.0

Changes made to the default values for Land Use Trip Percentages

Changes made to the default values for Area

The wood stove option switch changed from on to off.  
The fireplcase option switch changed from on to off.

Changes made to the default values for Operations

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The operational emission year changed from 2004 to 2030.  
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The operational summer temperature changed from 90 to 75.  
The operational summer selection item changed from 8 to 5.  
The double counting internal work trip limit changed from to 289.112416.  
The double counting shopping trip limit changed from to 144.556208.  
The double counting other trip limit changed from to 3618.7682.  
The travel mode environment settings changed from both to: none

**EXPLANATION OF CHANGES MADE TO DEFAULT SETTINGS IN URBEMIS 2002**

**Project Number:** 10953-00

**Project Name:** City of Lake Forest Opportunities Study Program EIR - Proposed Project (Site 2)

The following pages include the printed results of the air pollutant emissions modeling for one of the land use components of the proposed project. The air emissions modeling was conducted using the URBEMIS 2002 for Windows computer program developed for the Yolo-Solano Air Quality Management District in May 2003. URBEMIS 2002 is programmed with EMFAC 2002 emission factors developed by the California Air Resources Board.

As part of this analysis, changes have been made to several of the default values programmed into URBEMIS 2002. These changes were made to more accurately reflect the nature of the proposed land use. Each of these changes are discussed below.

**Vehicle Trip Rates**

The default vehicle trip rate values were changed to be consistent with the traffic impact analysis prepared for the project.

**Vehicle Fleet Mix**

URBEMIS 2002 is programmed with the following state-wide average vehicle fleet mix:

State-Wide Vehicle Type	Total	
Automobiles	52.5%	
Light-Duty Trucks <3,750 pounds	15.9%	
Light-Duty Trucks 3,751-5,750 pounds	16.7%	
Medium-Duty Trucks 5,751-8,500 pounds	7.6%	} 10.50% Total Trucks
Light-Heavy-Duty Trucks 8,501-10,000 pounds	1.0%	
Light-Heavy-Duty Trucks 10,001-14,000 pounds	0.3%	
Medium-Heavy-Duty Trucks 14,001-33,000 pounds	0.9%	
Heavy-Heavy-Duty Trucks 33,001-60,000 pounds	0.7%	
Line-Haul Vehicles	0.0%	
Urban Buses	0.2%	
Motorcycles	1.5%	
School Buses	0.1%	
Motor Homes	2.6%	

However, this state-wide average fleet mix is not appropriate for the majority of land use analyses. The project land use assessed in this analysis is identified below along with the total percentage of trucks (medium and heavy) that are expected for this land use. The following vehicle mix was calculated based on the percentage of trucks associated with this land use. The percentage of trucks for each land use were determined from the 3rd, 4th, 5th, and 6th Editions of the ITE Trip Generation manual.

ITE Code	Project Land Use:	Truck %	ADT	Truck #
210	Single Family	0.44%	5,024	22
230	Residential Condo	0.88%	1,149	10
220	Apartment	0.88%	3,132	28
150	Warehousing	27.00%	0	0
760	Research Center	1.84%	0	0
410	Park	0.44%	16	0
170	Utilities	30.00%	0	0
770	Business Park	1.84%	0	0
151	Mini Warehouse	7.00%	0	0
110	General Light Industry	8.00%	0	0
815	Discount Store	2.10%	9,905	208
0			0	0
Project Totals:			19,226	268
Project Truck %:			1.39%	

Vehicle Type	Total	
Automobiles	57.84%	
Light-Duty Trucks <3,750 pounds	17.52%	
Light-Duty Trucks 3,751-5,750 pounds	18.40%	
Medium-Duty Trucks 5,751-8,500 pounds	1.01%	} 1.39% Total Trucks
Light-Heavy-Duty Trucks 8,501-10,000 pounds	0.13%	
Light-Heavy-Duty Trucks 10,001-14,000 pounds	0.04%	
Medium-Heavy-Duty Trucks 14,001-33,000 pounds	0.12%	
Heavy-Heavy-Duty Trucks 33,001-60,000 pounds	0.09%	
Line-Haul Vehicles	0.00%	
Urban Buses	0.22%	
Motorcycles	1.65%	
School Buses	0.11%	
Motor Homes	2.86%	

URBEMIS 2002 For Windows 7.5.0

File Name: P:\Projects - All Users\10800-00+\10953-00 Lake Forest Opportunities Study EIR\EIR\A  
Project Name: City of Lake Forest EIR - Proposed Project Operational Emissions (Site 3)  
Project Location: South Coast Air Basin (Los Angeles area)  
On-Road Motor Vehicle Emissions Based on EMFAC2002 version 2.2

SUMMARY REPORT  
(Pounds/Day - Summer)

AREA SOURCE EMISSION ESTIMATES

	ROG	NOx	CO	SO2	PM10
TOTALS (lbs/day,unmitigated)	41.32	6.29	3.26	0.00	0.01

OPERATIONAL (VEHICLE) EMISSION ESTIMATES

	ROG	NOx	CO	SO2	PM10
TOTALS (lbs/day,unmitigated)	9.86	8.51	92.57	0.27	51.70

SUM OF AREA AND OPERATIONAL EMISSION ESTIMATES

	ROG	NOx	CO	SO2	PM10
TOTALS (lbs/day,unmitigated)	51.18	14.79	95.82	0.27	51.71

URBEMIS 2002 For Windows 7.5.0

File Name: P:\Projects - All Users\10800-00+\10953-00 Lake Forest Opportunities Study EIR\EIR\A  
Project Name: City of Lake Forest EIR - Proposed Project Operational Emissions (Site 3)  
Project Location: South Coast Air Basin (Los Angeles area)  
On-Road Motor Vehicle Emissions Based on EMFAC2002 version 2.2

SUMMARY REPORT  
(Pounds/Day - Winter)

AREA SOURCE EMISSION ESTIMATES

	ROG	NOx	CO	SO2	PM10
TOTALS (lbs/day,unmitigated)	41.24	6.28	2.67	0.00	0.01

OPERATIONAL (VEHICLE) EMISSION ESTIMATES

	ROG	NOx	CO	SO2	PM10
TOTALS (lbs/day,unmitigated)	9.64	11.06	102.17	0.25	51.70

SUM OF AREA AND OPERATIONAL EMISSION ESTIMATES

	ROG	NOx	CO	SO2	PM10
TOTALS (lbs/day,unmitigated)	50.88	17.34	104.85	0.25	51.71

URBEMIS 2002 For Windows 7.5.0

File Name: P:\Projects - All Users\10800-00+\10953-00 Lake Forest Opportunities Study EIR\EIR\A  
Project Name: City of Lake Forest EIR - Proposed Project Operational Emissions (Site 3)  
Project Location: South Coast Air Basin (Los Angeles area)  
On-Road Motor Vehicle Emissions Based on EMFAC2002 version 2.2

SUMMARY REPORT  
(Tons/Year)

AREA SOURCE EMISSION ESTIMATES

	ROG	NOx	CO	SO2	PM10
TOTALS (tpy, unmitigated)	7.53	1.15	0.54	0.00	0.00

OPERATIONAL (VEHICLE) EMISSION ESTIMATES

	ROG	NOx	CO	SO2	PM10
TOTALS (tpy, unmitigated)	1.79	1.71	17.48	0.05	9.43

SUM OF AREA AND OPERATIONAL EMISSION ESTIMATES

	ROG	NOx	CO	SO2	PM10
TOTALS (tpy, unmitigated)	9.32	2.85	18.02	0.05	9.44

URBEMIS 2002 For Windows 7.5.0

File Name: P:\Projects - All Users\10800-00+\10953-00 Lake Forest Opportunities Study EIR\EIR\A  
Project Name: City of Lake Forest EIR - Proposed Project Operational Emissions (Site 3)  
Project Location: South Coast Air Basin (Los Angeles area)  
On-Road Motor Vehicle Emissions Based on EMFAC2002 version 2.2

DETAIL REPORT  
(Pounds/Day - Winter)

AREA SOURCE EMISSION ESTIMATES (Winter Pounds per Day, Unmitigated)					
Source	ROG	NOx	CO	SO2	PM10
Natural Gas	0.49	6.28	2.67	-	0.01
Wood Stoves	0.00	0.00	0.00	0.00	0.00
Fireplaces	0.00	0.00	0.00	0.00	0.00
Landscaping - No winter emissions					
Consumer Prdcts	40.75	-	-	-	-
TOTALS (lbs/day, unmitigated)	41.24	6.28	2.67	0.00	0.01

UNMITIGATED OPERATIONAL EMISSIONS

	ROG	NOx	CO	SO2	PM10
Apartments low rise	8.80	10.03	92.92	0.23	46.94
City park	0.84	1.03	9.25	0.02	4.75
TOTAL EMISSIONS (lbs/day)	9.64	11.06	102.17	0.25	51.70

Does not include correction for passby trips.  
 Does not include double counting adjustment for internal trips.

OPERATIONAL (Vehicle) EMISSION ESTIMATES

Analysis Year: 2030 Temperature (F): 50 Season: Winter

EMFAC Version: EMFAC2002 (9/2002)

Summary of Land Uses:

Unit Type	Trip Rate	Size	Total Trips
Apartments low rise	5.59 trips / dwelling units	833.00	4,656.47
City park	50.00 trips / acres	11.00	550.00

Vehicle Assumptions:

Fleet Mix:

Vehicle Type	Percent Type	Non-Catalyst	Catalyst	Diesel
Light Auto	58.14	0.00	100.00	0.00
Light Truck < 3,750 lbs	17.61	0.00	100.00	0.00
Light Truck 3,751- 5,750	18.50	0.00	100.00	0.00
Med Truck 5,751- 8,500	0.64	0.00	100.00	0.00
Lite-Heavy 8,501-10,000	0.08	0.00	80.00	20.00
Lite-Heavy 10,001-14,000	0.03	0.00	66.70	33.30
Med-Heavy 14,001-33,000	0.08	0.00	22.20	77.80
Heavy-Heavy 33,001-60,000	0.06	0.00	0.00	100.00
Line Haul > 60,000 lbs	0.00	0.00	0.00	100.00
Urban Bus	0.22	0.00	50.00	50.00
Motorcycle	1.66	33.30	66.70	0.00
School Bus	0.11	0.00	0.00	100.00
Motor Home	2.87	0.00	92.30	7.70

Travel Conditions

	Residential			Commercial		
	Home-Work	Home-Shop	Home-Other	Commute	Non-Work	Customer
Urban Trip Length (miles)	11.5	4.9	6.0	10.3	5.5	5.5
Rural Trip Length (miles)	11.5	4.9	6.0	10.3	5.5	5.5
Trip Speeds (mph)	35.0	40.0	40.0	40.0	40.0	40.0
% of Trips - Residential	20.0	37.0	43.0			

% of Trips - Commercial (by land use)

City park	5.0	2.5	92.5
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Changes made to the default values for Land Use Trip Percentages

Changes made to the default values for Area

The wood stove option switch changed from on to off.  
The fireplcase option switch changed from on to off.

Changes made to the default values for Operations

The light auto percentage changed from 52.5 to 58.14.  
The light truck < 3750 lbs percentage changed from 15.9 to 17.61.  
The light truck 3751-5750 percentage changed from 16.7 to 18.50.  
The med truck 5751-8500 percentage changed from 7.6 to 0.64.  
The lite-heavy truck 8501-10000 percentage changed from 1.0 to 0.08.  
The lite-heavy truck 10001-14000 percentage changed from 0.3 to 0.03.  
The med-heavy truck 14001-33000 percentage changed from 0.9 to 0.08.  
The heavy-heavy truck 33001-60000 percentage changed from 0.7 to 0.06.  
The urban bus percentage changed from 0.2 to 0.22.  
The motorcycle percentage changed from 1.5 to 1.66.  
The school bus percentage changed from 0.1 to 0.11.  
The motorhome percentage changed from 2.6 to 2.87.  
The operational emission year changed from 2004 to 2030.  
The operational winter selection item changed from 3 to 2.  
The operational summer temperature changed from 90 to 75.  
The operational summer selection item changed from 8 to 5.  
The double counting internal work trip limit changed from to 27.5.  
The double counting shopping trip limit changed from to 13.75.  
The double counting other trip limit changed from to 508.75.  
The travel mode environment settings changed from both to: none

URBEMIS 2002 For Windows 7.5.0

File Name: P:\Projects - All Users\10800-00+\10953-00 Lake Forest Opportunities Study EIR\EIR\A  
Project Name: City of Lake Forest EIR - Proposed Project Operational Emissions (Site 3)  
Project Location: South Coast Air Basin (Los Angeles area)  
On-Road Motor Vehicle Emissions Based on EMFAC2002 version 2.2

DETAIL REPORT  
(Pounds/Day - Summer)

AREA SOURCE EMISSION ESTIMATES (Summer Pounds per Day, Unmitigated)					
Source	ROG	NOx	CO	SO2	PM10
Natural Gas	0.49	6.28	2.67	-	0.01
Wood Stoves - No summer emissions					
Fireplaces - No summer emissions					
Landscaping	0.08	0.01	0.58	0.00	0.00
Consumer Prdcts	40.75	-	-	-	-
TOTALS (lbs/day, unmitigated)	41.32	6.29	3.26	0.00	0.01

UNMITIGATED OPERATIONAL EMISSIONS

	ROG	NOx	CO	SO2	PM10
Apartments low rise	9.14	7.71	84.37	0.25	46.94
City park	0.72	0.80	8.20	0.02	4.75
TOTAL EMISSIONS (lbs/day)	9.86	8.51	92.57	0.27	51.70

Does not include correction for passby trips.  
 Does not include double counting adjustment for internal trips.

OPERATIONAL (Vehicle) EMISSION ESTIMATES

Analysis Year: 2030 Temperature (F): 75 Season: Summer

EMFAC Version: EMFAC2002 (9/2002)

Summary of Land Uses:

Unit Type	Trip Rate	Size	Total Trips
Apartments low rise	5.59 trips / dwelling units	833.00	4,656.47
City park	50.00 trips / acres	11.00	550.00

Vehicle Assumptions:

Fleet Mix:

Vehicle Type	Percent Type	Non-Catalyst	Catalyst	Diesel
Light Auto	58.14	0.00	100.00	0.00
Light Truck < 3,750 lbs	17.61	0.00	100.00	0.00
Light Truck 3,751- 5,750	18.50	0.00	100.00	0.00
Med Truck 5,751- 8,500	0.64	0.00	100.00	0.00
Lite-Heavy 8,501-10,000	0.08	0.00	80.00	20.00
Lite-Heavy 10,001-14,000	0.03	0.00	66.70	33.30
Med-Heavy 14,001-33,000	0.08	0.00	22.20	77.80
Heavy-Heavy 33,001-60,000	0.06	0.00	0.00	100.00
Line Haul > 60,000 lbs	0.00	0.00	0.00	100.00
Urban Bus	0.22	0.00	50.00	50.00
Motorcycle	1.66	33.30	66.70	0.00
School Bus	0.11	0.00	0.00	100.00
Motor Home	2.87	0.00	92.30	7.70

Travel Conditions

	Residential			Commercial		
	Home-Work	Home-Shop	Home-Other	Commute	Non-Work	Customer
Urban Trip Length (miles)	11.5	4.9	6.0	10.3	5.5	5.5
Rural Trip Length (miles)	11.5	4.9	6.0	10.3	5.5	5.5
Trip Speeds (mph)	35.0	40.0	40.0	40.0	40.0	40.0
% of Trips - Residential	20.0	37.0	43.0			

% of Trips - Commercial (by land use)

City park	5.0	2.5	92.5
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Changes made to the default values for Land Use Trip Percentages

Changes made to the default values for Area

The wood stove option switch changed from on to off.  
The fireplace option switch changed from on to off.

Changes made to the default values for Operations

The light auto percentage changed from 52.5 to 58.14.  
The light truck < 3750 lbs percentage changed from 15.9 to 17.61.  
The light truck 3751-5750 percentage changed from 16.7 to 18.50.  
The med truck 5751-8500 percentage changed from 7.6 to 0.64.  
The lite-heavy truck 8501-10000 percentage changed from 1.0 to 0.08.  
The lite-heavy truck 10001-14000 percentage changed from 0.3 to 0.03.  
The med-heavy truck 14001-33000 percentage changed from 0.9 to 0.08.  
The heavy-heavy truck 33001-60000 percentage changed from 0.7 to 0.06.  
The urban bus percentage changed from 0.2 to 0.22.  
The motorcycle percentage changed from 1.5 to 1.66.  
The school bus percentage changed from 0.1 to 0.11.  
The motorhome percentage changed from 2.6 to 2.87.  
The operational emission year changed from 2004 to 2030.  
The operational winter selection item changed from 3 to 2.  
The operational summer temperature changed from 90 to 75.  
The operational summer selection item changed from 8 to 5.  
The double counting internal work trip limit changed from to 27.5.  
The double counting shopping trip limit changed from to 13.75.  
The double counting other trip limit changed from to 508.75.  
The travel mode environment settings changed from both to: none

URBEMIS 2002 For Windows 7.5.0

File Name: P:\Projects - All Users\10800-00+\10953-00 Lake Forest Opportunities Study EIR\EIR\A  
Project Name: City of Lake Forest EIR - Proposed Project Operational Emissions (Site 3)  
Project Location: South Coast Air Basin (Los Angeles area)  
On-Road Motor Vehicle Emissions Based on EMFAC2002 version 2.2

DETAIL REPORT  
(Tons/Year)

AREA SOURCE EMISSION ESTIMATES

Source	ROG	NOx	CO	SO2	PM10
Natural Gas	0.09	1.15	0.49	-	0.00
Wood Stoves	0.00	0.00	0.00	0.00	0.00
Fireplaces	0.00	0.00	0.00	0.00	0.00
Landscaping	0.01	0.00	0.05	0.00	0.00
Consumer Prdcts	7.44	-	-	-	-
TOTALS (tpy, unmitigated)	7.53	1.15	0.54	0.00	0.00

UNMITIGATED OPERATIONAL EMISSIONS

	ROG	NOx	CO	SO2	PM10
Apartments low rise	1.65	1.55	15.92	0.04	8.57
City park	0.14	0.16	1.56	0.00	0.87
TOTAL EMISSIONS (tons/yr)	1.79	1.71	17.48	0.05	9.43

Does not include correction for passby trips.  
 Does not include double counting adjustment for internal trips.

OPERATIONAL (Vehicle) EMISSION ESTIMATES

Analysis Year: 2030 Temperature (F): 75 Season: Annual

EMFAC Version: EMFAC2002 (9/2002)

Summary of Land Uses:

Unit Type	Trip Rate	Size	Total Trips
Apartments low rise	5.59 trips / dwelling units	833.00	4,656.47
City park	50.00 trips / acres	11.00	550.00

Vehicle Assumptions:

Fleet Mix:

Vehicle Type	Percent Type	Non-Catalyst	Catalyst	Diesel
Light Auto	58.14	0.00	100.00	0.00
Light Truck < 3,750 lbs	17.61	0.00	100.00	0.00
Light Truck 3,751- 5,750	18.50	0.00	100.00	0.00
Med Truck 5,751- 8,500	0.64	0.00	100.00	0.00
Lite-Heavy 8,501-10,000	0.08	0.00	80.00	20.00
Lite-Heavy 10,001-14,000	0.03	0.00	66.70	33.30
Med-Heavy 14,001-33,000	0.08	0.00	22.20	77.80
Heavy-Heavy 33,001-60,000	0.06	0.00	0.00	100.00
Line Haul > 60,000 lbs	0.00	0.00	0.00	100.00
Urban Bus	0.22	0.00	50.00	50.00
Motorcycle	1.66	33.30	66.70	0.00
School Bus	0.11	0.00	0.00	100.00
Motor Home	2.87	0.00	92.30	7.70

Travel Conditions

	Residential			Commercial		
	Home-Work	Home-Shop	Home-Other	Commute	Non-Work	Customer
Urban Trip Length (miles)	11.5	4.9	6.0	10.3	5.5	5.5
Rural Trip Length (miles)	11.5	4.9	6.0	10.3	5.5	5.5
Trip Speeds (mph)	35.0	40.0	40.0	40.0	40.0	40.0
% of Trips - Residential	20.0	37.0	43.0			

% of Trips - Commercial (by land use)

City park	5.0	2.5	92.5
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Changes made to the default values for Land Use Trip Percentages

Changes made to the default values for Area

The wood stove option switch changed from on to off.  
The fireplace option switch changed from on to off.

Changes made to the default values for Operations

The light auto percentage changed from 52.5 to 58.14.  
The light truck < 3750 lbs percentage changed from 15.9 to 17.61.  
The light truck 3751-5750 percentage changed from 16.7 to 18.50.  
The med truck 5751-8500 percentage changed from 7.6 to 0.64.  
The lite-heavy truck 8501-10000 percentage changed from 1.0 to 0.08.  
The lite-heavy truck 10001-14000 percentage changed from 0.3 to 0.03.  
The med-heavy truck 14001-33000 percentage changed from 0.9 to 0.08.  
The heavy-heavy truck 33001-60000 percentage changed from 0.7 to 0.06.  
The urban bus percentage changed from 0.2 to 0.22.  
The motorcycle percentage changed from 1.5 to 1.66.  
The school bus percentage changed from 0.1 to 0.11.  
The motorhome percentage changed from 2.6 to 2.87.  
The operational emission year changed from 2004 to 2030.  
The operational winter selection item changed from 3 to 2.  
The operational summer temperature changed from 90 to 75.  
The operational summer selection item changed from 8 to 5.  
The double counting internal work trip limit changed from to 27.5.  
The double counting shopping trip limit changed from to 13.75.  
The double counting other trip limit changed from to 508.75.  
The travel mode environment settings changed from both to: none

**EXPLANATION OF CHANGES MADE TO DEFAULT SETTINGS IN URBEMIS 2002**

**Project Number:** 10953-00

**Project Name:** City of Lake Forest Opportunities Study Program EIR - Proposed Project (Site 3)

The following pages include the printed results of the air pollutant emissions modeling for one of the land use components of the proposed project. The air emissions modeling was conducted using the URBEMIS 2002 for Windows computer program developed for the Yolo-Solano Air Quality Management District in May 2003. URBEMIS 2002 is programmed with EMFAC 2002 emission factors developed by the California Air Resources Board.

As part of this analysis, changes have been made to several of the default values programmed into URBEMIS 2002. These changes were made to more accurately reflect the nature of the proposed land use. Each of these changes are discussed below.

**Vehicle Trip Rates**

The default vehicle trip rate values were changed to be consistent with the traffic impact analysis prepared for the project.

**Vehicle Fleet Mix**

URBEMIS 2002 is programmed with the following state-wide average vehicle fleet mix:

State-Wide Vehicle Type	Total	
Automobiles	52.5%	
Light-Duty Trucks <3,750 pounds	15.9%	
Light-Duty Trucks 3,751-5,750 pounds	16.7%	
Medium-Duty Trucks 5,751-8,500 pounds	7.6%	} 10.50% Total Trucks
Light-Heavy-Duty Trucks 8,501-10,000 pounds	1.0%	
Light-Heavy-Duty Trucks 10,001-14,000 pounds	0.3%	
Medium-Heavy-Duty Trucks 14,001-33,000 pounds	0.9%	
Heavy-Heavy-Duty Trucks 33,001-60,000 pounds	0.7%	
Line-Haul Vehicles	0.0%	
Urban Buses	0.2%	
Motorcycles	1.5%	
School Buses	0.1%	
Motor Homes	2.6%	

However, this state-wide average fleet mix is not appropriate for the majority of land use analyses. The project land use assessed in this analysis is identified below along with the total percentage of trucks (medium and heavy) that are expected for this land use. The following vehicle mix was calculated based on the percentage of trucks associated with this land use. The percentage of trucks for each land use were determined from the 3rd, 4th, 5th, and 6th Editions of the ITE Trip Generation manual.

ITE Code	Project Land Use:	Truck %	ADT	Truck #
210	Single Family	0.44%	0	0
230	Residential Condo	0.88%	0	0
220	Apartment	0.88%	5,598	49
150	Warehousing	27.00%	0	0
760	Research Center	1.84%	0	0
410	Park	0.44%	17	0
170	Utilities	30.00%	0	0
770	Business Park	1.84%	0	0
151	Mini Warehouse	7.00%	0	0
110	General Light Industry	8.00%	0	0
815	Discount Store	2.10%	0	0
0			0	0
Project Totals:			5,615	49
Project Truck %:			0.88%	

Vehicle Type	Total	
Automobiles	58.14%	
Light-Duty Trucks <3,750 pounds	17.61%	
Light-Duty Trucks 3,751-5,750 pounds	18.50%	
Medium-Duty Trucks 5,751-8,500 pounds	0.64%	} 0.88% Total Trucks
Light-Heavy-Duty Trucks 8,501-10,000 pounds	0.08%	
Light-Heavy-Duty Trucks 10,001-14,000 pounds	0.03%	
Medium-Heavy-Duty Trucks 14,001-33,000 pounds	0.08%	
Heavy-Heavy-Duty Trucks 33,001-60,000 pounds	0.06%	
Line-Haul Vehicles	0.00%	
Urban Buses	0.22%	
Motorcycles	1.66%	
School Buses	0.11%	
Motor Homes	2.88%	

URBEMIS 2002 For Windows 7.5.0

File Name: P:\Projects - All Users\10800-00+\10953-00 Lake Forest Opportunities Study EIR\EIR\A  
Project Name: City of Lake Forest EIR - Proposed Project Operational Emissions (Site 4)  
Project Location: South Coast Air Basin (Los Angeles area)  
On-Road Motor Vehicle Emissions Based on EMFAC2002 version 2.2

SUMMARY REPORT  
(Pounds/Day - Summer)

AREA SOURCE EMISSION ESTIMATES

	ROG	NOx	CO	SO2	PM10
TOTALS (lbs/day,unmitigated)	23.78	5.04	3.27	0.00	0.01

OPERATIONAL (VEHICLE) EMISSION ESTIMATES

	ROG	NOx	CO	SO2	PM10
TOTALS (lbs/day,unmitigated)	17.77	18.63	191.28	0.57	109.70

SUM OF AREA AND OPERATIONAL EMISSION ESTIMATES

	ROG	NOx	CO	SO2	PM10
TOTALS (lbs/day,unmitigated)	41.56	23.67	194.56	0.57	109.71

URBEMIS 2002 For Windows 7.5.0

File Name: P:\Projects - All Users\10800-00+\10953-00 Lake Forest Opportunities Study EIR\EIR\A  
Project Name: City of Lake Forest EIR - Proposed Project Operational Emissions (Site 4)  
Project Location: South Coast Air Basin (Los Angeles area)  
On-Road Motor Vehicle Emissions Based on EMFAC2002 version 2.2

SUMMARY REPORT  
(Pounds/Day - Winter)

AREA SOURCE EMISSION ESTIMATES

	ROG	NOx	CO	SO2	PM10
TOTALS (lbs/day,unmitigated)	23.62	5.03	2.10	0.00	0.01

OPERATIONAL (VEHICLE) EMISSION ESTIMATES

	ROG	NOx	CO	SO2	PM10
TOTALS (lbs/day,unmitigated)	19.71	24.12	215.30	0.52	109.70

SUM OF AREA AND OPERATIONAL EMISSION ESTIMATES

	ROG	NOx	CO	SO2	PM10
TOTALS (lbs/day,unmitigated)	43.33	29.15	217.41	0.52	109.71

URBEMIS 2002 For Windows 7.5.0

File Name: P:\Projects - All Users\10800-00+\10953-00 Lake Forest Opportunities Study EIR\EIR\A  
Project Name: City of Lake Forest EIR - Proposed Project Operational Emissions (Site 4)  
Project Location: South Coast Air Basin (Los Angeles area)  
On-Road Motor Vehicle Emissions Based on EMFAC2002 version 2.2

SUMMARY REPORT  
(Tons/Year)

AREA SOURCE EMISSION ESTIMATES

	ROG	NOx	CO	SO2	PM10
TOTALS (tpy, unmitigated)	4.33	0.92	0.49	0.00	0.00

OPERATIONAL (VEHICLE) EMISSION ESTIMATES

	ROG	NOx	CO	SO2	PM10
TOTALS (tpy, unmitigated)	3.36	3.73	36.37	0.10	20.02

SUM OF AREA AND OPERATIONAL EMISSION ESTIMATES

	ROG	NOx	CO	SO2	PM10
TOTALS (tpy, unmitigated)	7.69	4.65	36.86	0.10	20.02

URBEMIS 2002 For Windows 7.5.0

File Name: P:\Projects - All Users\10800-00+\10953-00 Lake Forest Opportunities Study EIR\EIR\A  
Project Name: City of Lake Forest EIR - Proposed Project Operational Emissions (Site 4)  
Project Location: South Coast Air Basin (Los Angeles area)  
On-Road Motor Vehicle Emissions Based on EMFAC2002 version 2.2

DETAIL REPORT  
(Pounds/Day - Winter)

AREA SOURCE EMISSION ESTIMATES (Winter Pounds per Day, Unmitigated)					
Source	ROG	NOx	CO	SO2	PM10
Natural Gas	0.38	5.03	2.10	-	0.01
Wood Stoves	0.00	0.00	0.00	0.00	0.00
Fireplaces	0.00	0.00	0.00	0.00	0.00
Landscaping - No winter emissions					
Consumer Prdcts	23.24	-	-	-	-
TOTALS (lbs/day, unmitigated)	23.62	5.03	2.10	0.00	0.01

UNMITIGATED OPERATIONAL EMISSIONS

	ROG	NOx	CO	SO2	PM10
Condo/townhouse general	4.66	5.34	48.94	0.12	24.67
City park	0.31	0.38	3.37	0.01	1.73
Free-standing discount st	14.75	18.39	162.99	0.39	83.31
TOTAL EMISSIONS (lbs/day)	19.71	24.12	215.30	0.52	109.70

Does not include correction for passby trips.  
Includes a double counting reduction for internal trips.

OPERATIONAL (Vehicle) EMISSION ESTIMATES

Analysis Year: 2030 Temperature (F): 50 Season: Winter

EMFAC Version: EMFAC2002 (9/2002)

Summary of Land Uses:

Unit Type	Trip Rate	Size	Total Trips
Condo/townhouse general	5.15 trips / dwelling units	475.00	2,446.25
City park	50.00 trips / acres	4.00	200.00
Free-standing discount st	65.89 trips / 1000 sq. ft.	150.00	9,883.50

Vehicle Assumptions:

Fleet Mix:

Vehicle Type	Percent Type	Non-Catalyst	Catalyst	Diesel
Light Auto	57.65	0.00	100.00	0.00
Light Truck < 3,750 lbs	17.46	0.00	100.00	0.00
Light Truck 3,751- 5,750	18.34	0.00	100.00	0.00
Med Truck 5,751- 8,500	1.25	0.00	100.00	0.00
Lite-Heavy 8,501-10,000	0.16	0.00	80.00	20.00
Lite-Heavy 10,001-14,000	0.05	0.00	66.70	33.30
Med-Heavy 14,001-33,000	0.15	0.00	22.20	77.80
Heavy-Heavy 33,001-60,000	0.12	0.00	0.00	100.00
Line Haul > 60,000 lbs	0.00	0.00	0.00	100.00
Urban Bus	0.22	0.00	50.00	50.00
Motorcycle	1.65	33.30	66.70	0.00
School Bus	0.11	0.00	0.00	100.00
Motor Home	2.84	0.00	92.30	7.70

Travel Conditions

	Residential			Commercial		
	Home-Work	Home-Shop	Home-Other	Commute	Non-Work	Customer
Urban Trip Length (miles)	11.5	4.9	6.0	10.3	5.5	5.5
Rural Trip Length (miles)	11.5	4.9	6.0	10.3	5.5	5.5
Trip Speeds (mph)	35.0	40.0	40.0	40.0	40.0	40.0
% of Trips - Residential	20.0	37.0	43.0			

% of Trips - Commercial (by land use)

City park	5.0	2.5	92.5
Free-standing discount store	2.0	1.0	97.0

Changes made to the default values for Land Use Trip Percentages

Changes made to the default values for Area

The wood stove option switch changed from on to off.  
The fireplace option switch changed from on to off.

Changes made to the default values for Operations

The light auto percentage changed from 52.5 to 57.65.  
The light truck < 3750 lbs percentage changed from 15.9 to 17.46.  
The light truck 3751-5750 percentage changed from 16.7 to 18.34.  
The med truck 5751-8500 percentage changed from 7.6 to 1.25.  
The lite-heavy truck 8501-10000 percentage changed from 1.0 to 0.16.  
The lite-heavy truck 10001-14000 percentage changed from 0.3 to 0.05.  
The med-heavy truck 14001-33000 percentage changed from 0.9 to 0.15.  
The heavy-heavy truck 33001-60000 percentage changed from 0.7 to 0.12.  
The urban bus percentage changed from 0.2 to 0.22.  
The motorcycle percentage changed from 1.5 to 1.65.  
The school bus percentage changed from 0.1 to 0.11.  
The motorhome percentage changed from 2.6 to 2.84.  
The operational emission year changed from 2004 to 2030.  
The operational winter selection item changed from 3 to 2.  
The operational summer temperature changed from 90 to 75.  
The operational summer selection item changed from 8 to 5.  
The double counting internal work trip limit changed from to 207.67.  
The double counting shopping trip limit changed from to 103.835.  
The double counting other trip limit changed from to 1051.8875.  
The travel mode environment settings changed from both to: none

URBEMIS 2002 For Windows 7.5.0

File Name: P:\Projects - All Users\10800-00+\10953-00 Lake Forest Opportunities Study EIR\EIR\A  
Project Name: City of Lake Forest EIR - Proposed Project Operational Emissions (Site 4)  
Project Location: South Coast Air Basin (Los Angeles area)  
On-Road Motor Vehicle Emissions Based on EMFAC2002 version 2.2

DETAIL REPORT  
(Pounds/Day - Summer)

AREA SOURCE EMISSION ESTIMATES (Summer Pounds per Day, Unmitigated)					
Source	ROG	NOx	CO	SO2	PM10
Natural Gas	0.38	5.03	2.10	-	0.01
Wood Stoves - No summer emissions					
Fireplaces - No summer emissions					
Landscaping	0.16	0.01	1.17	0.00	0.00
Consumer Prdcts	23.24	-	-	-	-
TOTALS (lbs/day, unmitigated)	23.78	5.04	3.27	0.00	0.01

UNMITIGATED OPERATIONAL EMISSIONS

	ROG	NOx	CO	SO2	PM10
Condo/townhouse general	4.91	4.12	44.45	0.13	24.67
City park	0.26	0.29	2.99	0.01	1.73
Free-standing discount st	12.60	14.21	143.85	0.43	83.31
TOTAL EMISSIONS (lbs/day)	17.77	18.63	191.28	0.57	109.70

Does not include correction for passby trips.  
Includes a double counting reduction for internal trips.

OPERATIONAL (Vehicle) EMISSION ESTIMATES

Analysis Year: 2030 Temperature (F): 75 Season: Summer

EMFAC Version: EMFAC2002 (9/2002)

Summary of Land Uses:

Unit Type	Trip Rate	Size	Total Trips
Condo/townhouse general	5.15 trips / dwelling units	475.00	2,446.25
City park	50.00 trips / acres	4.00	200.00
Free-standing discount st	65.89 trips / 1000 sq. ft.	150.00	9,883.50

Vehicle Assumptions:

Fleet Mix:

Vehicle Type	Percent Type	Non-Catalyst	Catalyst	Diesel
Light Auto	57.65	0.00	100.00	0.00
Light Truck < 3,750 lbs	17.46	0.00	100.00	0.00
Light Truck 3,751- 5,750	18.34	0.00	100.00	0.00
Med Truck 5,751- 8,500	1.25	0.00	100.00	0.00
Lite-Heavy 8,501-10,000	0.16	0.00	80.00	20.00
Lite-Heavy 10,001-14,000	0.05	0.00	66.70	33.30
Med-Heavy 14,001-33,000	0.15	0.00	22.20	77.80
Heavy-Heavy 33,001-60,000	0.12	0.00	0.00	100.00
Line Haul > 60,000 lbs	0.00	0.00	0.00	100.00
Urban Bus	0.22	0.00	50.00	50.00
Motorcycle	1.65	33.30	66.70	0.00
School Bus	0.11	0.00	0.00	100.00
Motor Home	2.84	0.00	92.30	7.70

Travel Conditions

	Residential			Commercial		
	Home-Work	Home-Shop	Home-Other	Commuter	Non-Work	Customer
Urban Trip Length (miles)	11.5	4.9	6.0	10.3	5.5	5.5
Rural Trip Length (miles)	11.5	4.9	6.0	10.3	5.5	5.5
Trip Speeds (mph)	35.0	40.0	40.0	40.0	40.0	40.0
% of Trips - Residential	20.0	37.0	43.0			

% of Trips - Commercial (by land use)

City park	5.0	2.5	92.5
Free-standing discount store	2.0	1.0	97.0

Changes made to the default values for Land Use Trip Percentages

Changes made to the default values for Area

The wood stove option switch changed from on to off.  
The fireplace option switch changed from on to off.

Changes made to the default values for Operations

The light auto percentage changed from 52.5 to 57.65.  
The light truck < 3750 lbs percentage changed from 15.9 to 17.46.  
The light truck 3751-5750 percentage changed from 16.7 to 18.34.  
The med truck 5751-8500 percentage changed from 7.6 to 1.25.  
The lite-heavy truck 8501-10000 percentage changed from 1.0 to 0.16.  
The lite-heavy truck 10001-14000 percentage changed from 0.3 to 0.05.  
The med-heavy truck 14001-33000 percentage changed from 0.9 to 0.15.  
The heavy-heavy truck 33001-60000 percentage changed from 0.7 to 0.12.  
The urban bus percentage changed from 0.2 to 0.22.  
The motorcycle percentage changed from 1.5 to 1.65.  
The school bus percentage changed from 0.1 to 0.11.  
The motorhome percentage changed from 2.6 to 2.84.  
The operational emission year changed from 2004 to 2030.  
The operational winter selection item changed from 3 to 2.  
The operational summer temperature changed from 90 to 75.  
The operational summer selection item changed from 8 to 5.  
The double counting internal work trip limit changed from to 207.67.  
The double counting shopping trip limit changed from to 103.835.  
The double counting other trip limit changed from to 1051.8875.  
The travel mode environment settings changed from both to: none

URBEMIS 2002 For Windows 7.5.0

File Name: P:\Projects - All Users\10800-00+\10953-00 Lake Forest Opportunities Study EIR\EIR\A  
Project Name: City of Lake Forest EIR - Proposed Project Operational Emissions (Site 4)  
Project Location: South Coast Air Basin (Los Angeles area)  
On-Road Motor Vehicle Emissions Based on EMFAC2002 version 2.2

DETAIL REPORT  
(Tons/Year)

AREA SOURCE EMISSION ESTIMATES

Source	ROG	NOx	CO	SO2	PM10
Natural Gas	0.07	0.92	0.38	-	0.00
Wood Stoves	0.00	0.00	0.00	0.00	0.00
Fireplaces	0.00	0.00	0.00	0.00	0.00
Landscaping	0.01	0.00	0.11	0.00	0.00
Consumer Prdcts	4.24	-	-	-	-
TOTALS (tpy, unmitigated)	4.33	0.92	0.49	0.00	0.00

UNMITIGATED OPERATIONAL EMISSIONS

	ROG	NOx	CO	SO2	PM10
Condo/townhouse general	0.88	0.83	8.38	0.02	4.50
City park	0.05	0.06	0.57	0.00	0.32
Free-standing discount st	2.43	2.85	27.42	0.08	15.20
TOTAL EMISSIONS (tons/yr)	3.36	3.73	36.37	0.10	20.02

Does not include correction for passby trips.  
Includes a double counting reduction for internal trips.

OPERATIONAL (Vehicle) EMISSION ESTIMATES

Analysis Year: 2030 Temperature (F): 75 Season: Annual

EMFAC Version: EMFAC2002 (9/2002)

Summary of Land Uses:

Unit Type	Trip Rate	Size	Total Trips
Condo/townhouse general	5.15 trips / dwelling units	475.00	2,446.25
City park	50.00 trips / acres	4.00	200.00
Free-standing discount st	65.89 trips / 1000 sq. ft.	150.00	9,883.50

Vehicle Assumptions:

Fleet Mix:

Vehicle Type	Percent Type	Non-Catalyst	Catalyst	Diesel
Light Auto	57.65	0.00	100.00	0.00
Light Truck < 3,750 lbs	17.46	0.00	100.00	0.00
Light Truck 3,751- 5,750	18.34	0.00	100.00	0.00
Med Truck 5,751- 8,500	1.25	0.00	100.00	0.00
Lite-Heavy 8,501-10,000	0.16	0.00	80.00	20.00
Lite-Heavy 10,001-14,000	0.05	0.00	66.70	33.30
Med-Heavy 14,001-33,000	0.15	0.00	22.20	77.80
Heavy-Heavy 33,001-60,000	0.12	0.00	0.00	100.00
Line Haul > 60,000 lbs	0.00	0.00	0.00	100.00
Urban Bus	0.22	0.00	50.00	50.00
Motorcycle	1.65	33.30	66.70	0.00
School Bus	0.11	0.00	0.00	100.00
Motor Home	2.84	0.00	92.30	7.70

Travel Conditions

	Residential			Commercial		
	Home-Work	Home-Shop	Home-Other	Commute	Non-Work	Customer
Urban Trip Length (miles)	11.5	4.9	6.0	10.3	5.5	5.5
Rural Trip Length (miles)	11.5	4.9	6.0	10.3	5.5	5.5
Trip Speeds (mph)	35.0	40.0	40.0	40.0	40.0	40.0
% of Trips - Residential	20.0	37.0	43.0			

% of Trips - Commercial (by land use)

City park	5.0	2.5	92.5
Free-standing discount store	2.0	1.0	97.0

Changes made to the default values for Land Use Trip Percentages

Changes made to the default values for Area

The wood stove option switch changed from on to off.  
The fireplace option switch changed from on to off.

Changes made to the default values for Operations

The light auto percentage changed from 52.5 to 57.65.  
The light truck < 3750 lbs percentage changed from 15.9 to 17.46.  
The light truck 3751-5750 percentage changed from 16.7 to 18.34.  
The med truck 5751-8500 percentage changed from 7.6 to 1.25.  
The lite-heavy truck 8501-10000 percentage changed from 1.0 to 0.16.  
The lite-heavy truck 10001-14000 percentage changed from 0.3 to 0.05.  
The med-heavy truck 14001-33000 percentage changed from 0.9 to 0.15.  
The heavy-heavy truck 33001-60000 percentage changed from 0.7 to 0.12.  
The urban bus percentage changed from 0.2 to 0.22.  
The motorcycle percentage changed from 1.5 to 1.65.  
The school bus percentage changed from 0.1 to 0.11.  
The motorhome percentage changed from 2.6 to 2.84.  
The operational emission year changed from 2004 to 2030.  
The operational winter selection item changed from 3 to 2.  
The operational summer temperature changed from 90 to 75.  
The operational summer selection item changed from 8 to 5.  
The double counting internal work trip limit changed from to 207.67.  
The double counting shopping trip limit changed from to 103.835.  
The double counting other trip limit changed from to 1051.8875.  
The travel mode environment settings changed from both to: none

**EXPLANATION OF CHANGES MADE TO DEFAULT SETTINGS IN URBEMIS 2002**

**Project Number:** 10953-00

**Project Name:** City of Lake Forest Opportunities Study Program EIR - Proposed Project (Site 4)

The following pages include the printed results of the air pollutant emissions modeling for one of the land use components of the proposed project. The air emissions modeling was conducted using the URBEMIS 2002 for Windows computer program developed for the Yolo-Solano Air Quality Management District in May 2003. URBEMIS 2002 is programmed with EMFAC 2002 emission factors developed by the California Air Resources Board.

As part of this analysis, changes have been made to several of the default values programmed into URBEMIS 2002. These changes were made to more accurately reflect the nature of the proposed land use. Each of these changes are discussed below.

**Vehicle Trip Rates**

The default vehicle trip rate values were changed to be consistent with the traffic impact analysis prepared for the project.

**Vehicle Fleet Mix**

URBEMIS 2002 is programmed with the following state-wide average vehicle fleet mix:

State-Wide Vehicle Type	Total	
Automobiles	52.5%	
Light-Duty Trucks <3,750 pounds	15.9%	
Light-Duty Trucks 3,751-5,750 pounds	16.7%	
Medium-Duty Trucks 5,751-8,500 pounds	7.6%	} 10.50% Total Trucks
Light-Heavy-Duty Trucks 8,501-10,000 pounds	1.0%	
Light-Heavy-Duty Trucks 10,001-14,000 pounds	0.3%	
Medium-Heavy-Duty Trucks 14,001-33,000 pounds	0.9%	
Heavy-Heavy-Duty Trucks 33,001-60,000 pounds	0.7%	
Line-Haul Vehicles	0.0%	
Urban Buses	0.2%	
Motorcycles	1.5%	
School Buses	0.1%	
Motor Homes	2.6%	

However, this state-wide average fleet mix is not appropriate for the majority of land use analyses. The project land use assessed in this analysis is identified below along with the total percentage of trucks (medium and heavy) that are expected for this land use. The following vehicle mix was calculated based on the percentage of trucks associated with this land use. The percentage of trucks for each land use were determined from the 3rd, 4th, 5th, and 6th Editions of the ITE Trip Generation manual.

ITE Code	Project Land Use:	Truck %	ADT	Truck #
210	Single Family	0.44%	0	0
230	Residential Condo	0.88%	3,871	34
220	Apartment	0.88%	0	0
150	Warehousing	27.00%	0	0
760	Research Center	1.84%	0	0
410	Park	0.44%	6	0
170	Utilities	30.00%	0	0
770	Business Park	1.84%	0	0
151	Mini Warehouse	7.00%	0	0
110	General Light Industry	8.00%	0	0
815	Discount Store	2.10%	8,839	186
0			0	0
Project Totals:			12,716	220
Project Truck %:			1.73%	

Vehicle Type	Total	
Automobiles	57.65%	
Light-Duty Trucks <3,750 pounds	17.46%	
Light-Duty Trucks 3,751-5,750 pounds	18.34%	
Medium-Duty Trucks 5,751-8,500 pounds	1.25%	} 1.73% Total Trucks
Light-Heavy-Duty Trucks 8,501-10,000 pounds	0.16%	
Light-Heavy-Duty Trucks 10,001-14,000 pounds	0.05%	
Medium-Heavy-Duty Trucks 14,001-33,000 pounds	0.15%	
Heavy-Heavy-Duty Trucks 33,001-60,000 pounds	0.12%	
Line-Haul Vehicles	0.00%	
Urban Buses	0.22%	
Motorcycles	1.65%	
School Buses	0.11%	
Motor Homes	2.85%	

URBEMIS 2002 For Windows 7.5.0

File Name: P:\Projects - All Users\10800-00+\10953-00 Lake Forest Opportunities Study EIR\EIR\A  
Project Name: City of Lake Forest EIR - Proposed Project Operational Emissions (Site 5)  
Project Location: South Coast Air Basin (Los Angeles area)  
On-Road Motor Vehicle Emissions Based on EMFAC2002 version 2.2

SUMMARY REPORT  
(Pounds/Day - Summer)

AREA SOURCE EMISSION ESTIMATES

	ROG	NOx	CO	SO2	PM10
TOTALS (lbs/day,unmitigated)	3.85	0.95	1.31	0.03	0.00

OPERATIONAL (VEHICLE) EMISSION ESTIMATES

	ROG	NOx	CO	SO2	PM10
TOTALS (lbs/day,unmitigated)	1.40	1.31	14.41	0.04	8.02

SUM OF AREA AND OPERATIONAL EMISSION ESTIMATES

	ROG	NOx	CO	SO2	PM10
TOTALS (lbs/day,unmitigated)	5.24	2.26	15.72	0.07	8.02

URBEMIS 2002 For Windows 7.5.0

File Name: P:\Projects - All Users\10800-00+\10953-00 Lake Forest Opportunities Study EIR\EIR\A  
Project Name: City of Lake Forest EIR - Proposed Project Operational Emissions (Site 5)  
Project Location: South Coast Air Basin (Los Angeles area)  
On-Road Motor Vehicle Emissions Based on EMFAC2002 version 2.2

SUMMARY REPORT  
(Pounds/Day - Winter)

AREA SOURCE EMISSION ESTIMATES

	ROG	NOx	CO	SO2	PM10
TOTALS (lbs/day,unmitigated)	3.74	0.94	0.40	0.00	0.00

OPERATIONAL (VEHICLE) EMISSION ESTIMATES

	ROG	NOx	CO	SO2	PM10
TOTALS (lbs/day,unmitigated)	1.48	1.70	15.87	0.04	8.02

SUM OF AREA AND OPERATIONAL EMISSION ESTIMATES

	ROG	NOx	CO	SO2	PM10
TOTALS (lbs/day,unmitigated)	5.22	2.64	16.27	0.04	8.02

URBEMIS 2002 For Windows 7.5.0

File Name: P:\Projects - All Users\10800-00+\10953-00 Lake Forest Opportunities Study EIR\EIR\A  
Project Name: City of Lake Forest EIR - Proposed Project Operational Emissions (Site 5)  
Project Location: South Coast Air Basin (Los Angeles area)  
On-Road Motor Vehicle Emissions Based on EMFAC2002 version 2.2

SUMMARY REPORT  
(Tons/Year)

AREA SOURCE EMISSION ESTIMATES

	ROG	NOx	CO	SO2	PM10
TOTALS (tpy, unmitigated)	0.69	0.17	0.16	0.00	0.00

OPERATIONAL (VEHICLE) EMISSION ESTIMATES

	ROG	NOx	CO	SO2	PM10
TOTALS (tpy, unmitigated)	0.26	0.26	2.72	0.01	1.46

SUM OF AREA AND OPERATIONAL EMISSION ESTIMATES

	ROG	NOx	CO	SO2	PM10
TOTALS (tpy, unmitigated)	0.95	0.44	2.87	0.01	1.46

URBEMIS 2002 For Windows 7.5.0

File Name: P:\Projects - All Users\10800-00+\10953-00 Lake Forest Opportunities Study EIR\EIR\A  
Project Name: City of Lake Forest EIR - Proposed Project Operational Emissions (Site 5)  
Project Location: South Coast Air Basin (Los Angeles area)  
On-Road Motor Vehicle Emissions Based on EMFAC2002 version 2.2

DETAIL REPORT  
(Pounds/Day - Winter)

AREA SOURCE EMISSION ESTIMATES (Winter Pounds per Day, Unmitigated)					
Source	ROG	NOx	CO	SO2	PM10
Natural Gas	0.07	0.94	0.40	-	0.00
Wood Stoves	0.00	0.00	0.00	0.00	0.00
Fireplaces	0.00	0.00	0.00	0.00	0.00
Landscaping - No winter emissions					
Consumer Prdcts	3.67	-	-	-	-
TOTALS (lbs/day, unmitigated)	3.74	0.94	0.40	0.00	0.00

UNMITIGATED OPERATIONAL EMISSIONS

	ROG	NOx	CO	SO2	PM10
Single family housing	1.48	1.70	15.87	0.04	8.02
TOTAL EMISSIONS (lbs/day)	1.48	1.70	15.87	0.04	8.02

Does not include correction for passby trips.  
 Does not include double counting adjustment for internal trips.

OPERATIONAL (Vehicle) EMISSION ESTIMATES

Analysis Year: 2030 Temperature (F): 50 Season: Winter

EMFAC Version: EMFAC2002 (9/2002)

Summary of Land Uses:

Unit Type	Trip Rate	Size	Total Trips
Single family housing	10.61 trips / dwelling units	75.00	795.75

Vehicle Assumptions:

Fleet Mix:

Vehicle Type	Percent Type	Non-Catalyst	Catalyst	Diesel
Light Auto	58.40	0.00	100.00	0.00
Light Truck < 3,750 lbs	17.69	0.00	100.00	0.00
Light Truck 3,751- 5,750	18.58	0.00	100.00	0.00
Med Truck 5,751- 8,500	0.32	0.00	100.00	0.00
Lite-Heavy 8,501-10,000	0.04	0.00	80.00	20.00
Lite-Heavy 10,001-14,000	0.01	0.00	66.70	33.30
Med-Heavy 14,001-33,000	0.04	0.00	22.20	77.80
Heavy-Heavy 33,001-60,000	0.03	0.00	0.00	100.00
Line Haul > 60,000 lbs	0.00	0.00	0.00	100.00
Urban Bus	0.22	0.00	50.00	50.00
Motorcycle	1.67	33.30	66.70	0.00
School Bus	0.11	0.00	0.00	100.00
Motor Home	2.89	0.00	92.30	7.70

Travel Conditions

	Residential			Commercial		
	Home-Work	Home-Shop	Home-Other	Commute	Non-Work	Customer
Urban Trip Length (miles)	11.5	4.9	6.0	10.3	5.5	5.5
Rural Trip Length (miles)	11.5	4.9	6.0	10.3	5.5	5.5
Trip Speeds (mph)	35.0	40.0	40.0	40.0	40.0	40.0
% of Trips - Residential	20.0	37.0	43.0			

Changes made to the default values for Land Use Trip Percentages

Changes made to the default values for Area

The wood stove option switch changed from on to off.  
The fireplcase option switch changed from on to off.

Changes made to the default values for Operations

The light auto percentage changed from 52.5 to 58.4.  
The light truck < 3750 lbs percentage changed from 15.9 to 17.69.  
The light truck 3751-5750 percentage changed from 16.7 to 18.58.  
The med truck 5751-8500 percentage changed from 7.6 to 0.32.  
The lite-heavy truck 8501-10000 percentage changed from 1.0 to 0.04.  
The lite-heavy truck 10001-14000 percentage changed from 0.3 to 0.01.  
The med-heavy truck 14001-33000 percentage changed from 0.9 to 0.04.  
The heavy-heavy truck 33001-60000 percentage changed from 0.7 to 0.03.  
The urban bus percentage changed from 0.2 to 0.22.  
The motorcycle percentage changed from 1.5 to 1.67.  
The school bus percentage changed from 0.1 to 0.11.  
The motorhome percentage changed from 2.6 to 2.89.  
The operational emission year changed from 2004 to 2030.  
The operational winter selection item changed from 3 to 2.  
The operational summer temperature changed from 90 to 75.  
The operational summer selection item changed from 8 to 5.  
The travel mode environment settings changed from both to: none

URBEMIS 2002 For Windows 7.5.0

File Name: P:\Projects - All Users\10800-00+\10953-00 Lake Forest Opportunities Study EIR\EIR\A  
Project Name: City of Lake Forest EIR - Proposed Project Operational Emissions (Site 5)  
Project Location: South Coast Air Basin (Los Angeles area)  
On-Road Motor Vehicle Emissions Based on EMFAC2002 version 2.2

DETAIL REPORT  
(Pounds/Day - Summer)

AREA SOURCE EMISSION ESTIMATES (Summer Pounds per Day, Unmitigated)					
Source	ROG	NOx	CO	SO2	PM10
Natural Gas	0.07	0.94	0.40	-	0.00
Wood Stoves - No summer emissions					
Fireplaces - No summer emissions					
Landscaping	0.11	0.01	0.91	0.03	0.00
Consumer Prdcts	3.67	-	-	-	-
TOTALS (lbs/day, unmitigated)	3.85	0.95	1.31	0.03	0.00

UNMITIGATED OPERATIONAL EMISSIONS

	ROG	NOx	CO	SO2	PM10
Single family housing	1.40	1.31	14.41	0.04	8.02
TOTAL EMISSIONS (lbs/day)	1.40	1.31	14.41	0.04	8.02

Does not include correction for passby trips.  
 Does not include double counting adjustment for internal trips.

OPERATIONAL (Vehicle) EMISSION ESTIMATES

Analysis Year: 2030 Temperature (F): 75 Season: Summer

EMFAC Version: EMFAC2002 (9/2002)

Summary of Land Uses:

Unit Type	Trip Rate	Size	Total Trips
Single family housing	10.61 trips / dwelling units	75.00	795.75

Vehicle Assumptions:

Fleet Mix:

Vehicle Type	Percent Type	Non-Catalyst	Catalyst	Diesel
Light Auto	58.40	0.00	100.00	0.00
Light Truck < 3,750 lbs	17.69	0.00	100.00	0.00
Light Truck 3,751- 5,750	18.58	0.00	100.00	0.00
Med Truck 5,751- 8,500	0.32	0.00	100.00	0.00
Lite-Heavy 8,501-10,000	0.04	0.00	80.00	20.00
Lite-Heavy 10,001-14,000	0.01	0.00	66.70	33.30
Med-Heavy 14,001-33,000	0.04	0.00	22.20	77.80
Heavy-Heavy 33,001-60,000	0.03	0.00	0.00	100.00
Line Haul > 60,000 lbs	0.00	0.00	0.00	100.00
Urban Bus	0.22	0.00	50.00	50.00
Motorcycle	1.67	33.30	66.70	0.00
School Bus	0.11	0.00	0.00	100.00
Motor Home	2.89	0.00	92.30	7.70

Travel Conditions

	Residential			Commercial		
	Home-Work	Home-Shop	Home-Other	Commute	Non-Work	Customer
Urban Trip Length (miles)	11.5	4.9	6.0	10.3	5.5	5.5
Rural Trip Length (miles)	11.5	4.9	6.0	10.3	5.5	5.5
Trip Speeds (mph)	35.0	40.0	40.0	40.0	40.0	40.0
% of Trips - Residential	20.0	37.0	43.0			

Changes made to the default values for Land Use Trip Percentages

Changes made to the default values for Area

The wood stove option switch changed from on to off.  
The fireplcase option switch changed from on to off.

Changes made to the default values for Operations

The light auto percentage changed from 52.5 to 58.4.  
The light truck < 3750 lbs percentage changed from 15.9 to 17.69.  
The light truck 3751-5750 percentage changed from 16.7 to 18.58.  
The med truck 5751-8500 percentage changed from 7.6 to 0.32.  
The lite-heavy truck 8501-10000 percentage changed from 1.0 to 0.04.  
The lite-heavy truck 10001-14000 percentage changed from 0.3 to 0.01.  
The med-heavy truck 14001-33000 percentage changed from 0.9 to 0.04.  
The heavy-heavy truck 33001-60000 percentage changed from 0.7 to 0.03.  
The urban bus percentage changed from 0.2 to 0.22.  
The motorcycle percentage changed from 1.5 to 1.67.  
The school bus percentage changed from 0.1 to 0.11.  
The motorhome percentage changed from 2.6 to 2.89.  
The operational emission year changed from 2004 to 2030.  
The operational winter selection item changed from 3 to 2.  
The operational summer temperature changed from 90 to 75.  
The operational summer selection item changed from 8 to 5.  
The travel mode environment settings changed from both to: none

URBEMIS 2002 For Windows 7.5.0

File Name: P:\Projects - All Users\10800-00+\10953-00 Lake Forest Opportunities Study EIR\EIR\A  
Project Name: City of Lake Forest EIR - Proposed Project Operational Emissions (Site 5)  
Project Location: South Coast Air Basin (Los Angeles area)  
On-Road Motor Vehicle Emissions Based on EMFAC2002 version 2.2

DETAIL REPORT  
(Tons/Year)

AREA SOURCE EMISSION ESTIMATES

Source	ROG	NOx	CO	SO2	PM10
Natural Gas	0.01	0.17	0.07	-	0.00
Wood Stoves	0.00	0.00	0.00	0.00	0.00
Fireplaces	0.00	0.00	0.00	0.00	0.00
Landscaping	0.01	0.00	0.08	0.00	0.00
Consumer Prdcts	0.67	-	-	-	-
TOTALS (tpy, unmitigated)	0.69	0.17	0.16	0.00	0.00

UNMITIGATED OPERATIONAL EMISSIONS

	ROG	NOx	CO	SO2	PM10
Single family housing	0.26	0.26	2.72	0.01	1.46
TOTAL EMISSIONS (tons/yr)	0.26	0.26	2.72	0.01	1.46

Does not include correction for passby trips.  
 Does not include double counting adjustment for internal trips.

OPERATIONAL (Vehicle) EMISSION ESTIMATES

Analysis Year: 2030 Temperature (F): 75 Season: Annual

EMFAC Version: EMFAC2002 (9/2002)

Summary of Land Uses:

Unit Type	Trip Rate	Size	Total Trips
Single family housing	10.61 trips / dwelling units	75.00	795.75

Vehicle Assumptions:

Fleet Mix:

Vehicle Type	Percent Type	Non-Catalyst	Catalyst	Diesel
Light Auto	58.40	0.00	100.00	0.00
Light Truck < 3,750 lbs	17.69	0.00	100.00	0.00
Light Truck 3,751- 5,750	18.58	0.00	100.00	0.00
Med Truck 5,751- 8,500	0.32	0.00	100.00	0.00
Lite-Heavy 8,501-10,000	0.04	0.00	80.00	20.00
Lite-Heavy 10,001-14,000	0.01	0.00	66.70	33.30
Med-Heavy 14,001-33,000	0.04	0.00	22.20	77.80
Heavy-Heavy 33,001-60,000	0.03	0.00	0.00	100.00
Line Haul > 60,000 lbs	0.00	0.00	0.00	100.00
Urban Bus	0.22	0.00	50.00	50.00
Motorcycle	1.67	33.30	66.70	0.00
School Bus	0.11	0.00	0.00	100.00
Motor Home	2.89	0.00	92.30	7.70

Travel Conditions

	Residential			Commercial		
	Home-Work	Home-Shop	Home-Other	Commute	Non-Work	Customer
Urban Trip Length (miles)	11.5	4.9	6.0	10.3	5.5	5.5
Rural Trip Length (miles)	11.5	4.9	6.0	10.3	5.5	5.5
Trip Speeds (mph)	35.0	40.0	40.0	40.0	40.0	40.0
% of Trips - Residential	20.0	37.0	43.0			

Changes made to the default values for Land Use Trip Percentages

Changes made to the default values for Area

The wood stove option switch changed from on to off.  
The fireplcase option switch changed from on to off.

Changes made to the default values for Operations

The light auto percentage changed from 52.5 to 58.4.  
The light truck < 3750 lbs percentage changed from 15.9 to 17.69.  
The light truck 3751-5750 percentage changed from 16.7 to 18.58.  
The med truck 5751-8500 percentage changed from 7.6 to 0.32.  
The lite-heavy truck 8501-10000 percentage changed from 1.0 to 0.04.  
The lite-heavy truck 10001-14000 percentage changed from 0.3 to 0.01.  
The med-heavy truck 14001-33000 percentage changed from 0.9 to 0.04.  
The heavy-heavy truck 33001-60000 percentage changed from 0.7 to 0.03.  
The urban bus percentage changed from 0.2 to 0.22.  
The motorcycle percentage changed from 1.5 to 1.67.  
The school bus percentage changed from 0.1 to 0.11.  
The motorhome percentage changed from 2.6 to 2.89.  
The operational emission year changed from 2004 to 2030.  
The operational winter selection item changed from 3 to 2.  
The operational summer temperature changed from 90 to 75.  
The operational summer selection item changed from 8 to 5.  
The travel mode environment settings changed from both to: none

**EXPLANATION OF CHANGES MADE TO DEFAULT SETTINGS IN URBEMIS 2002**

**Project Number:** 10953-00

**Project Name:** City of Lake Forest Opportunities Study Program EIR - Proposed Project (Site 5)

The following pages include the printed results of the air pollutant emissions modeling for one of the land use components of the proposed project. The air emissions modeling was conducted using the URBEMIS 2002 for Windows computer program developed for the Yolo-Solano Air Quality Management District in May 2003. URBEMIS 2002 is programmed with EMFAC 2002 emission factors developed by the California Air Resources Board.

As part of this analysis, changes have been made to several of the default values programmed into URBEMIS 2002. These changes were made to more accurately reflect the nature of the proposed land use. Each of these changes are discussed below.

**Vehicle Trip Rates**

The default vehicle trip rate values were changed to be consistent with the traffic impact analysis prepared for the project.

**Vehicle Fleet Mix**

URBEMIS 2002 is programmed with the following state-wide average vehicle fleet mix:

State-Wide Vehicle Type	Total	
Automobiles	52.5%	
Light-Duty Trucks <3,750 pounds	15.9%	
Light-Duty Trucks 3,751-5,750 pounds	16.7%	
Medium-Duty Trucks 5,751-8,500 pounds	7.6%	} 10.50% Total Trucks
Light-Heavy-Duty Trucks 8,501-10,000 pounds	1.0%	
Light-Heavy-Duty Trucks 10,001-14,000 pounds	0.3%	
Medium-Heavy-Duty Trucks 14,001-33,000 pounds	0.9%	
Heavy-Heavy-Duty Trucks 33,001-60,000 pounds	0.7%	
Line-Haul Vehicles	0.0%	
Urban Buses	0.2%	
Motorcycles	1.5%	
School Buses	0.1%	
Motor Homes	2.6%	

However, this state-wide average fleet mix is not appropriate for the majority of land use analyses. The project land use assessed in this analysis is identified below along with the total percentage of trucks (medium and heavy) that are expected for this land use. The following vehicle mix was calculated based on the percentage of trucks associated with this land use. The percentage of trucks for each land use were determined from the 3rd, 4th, 5th, and 6th Editions of the ITE Trip Generation manual.

ITE Code	Project Land Use:	Truck %	ADT	Truck #
210	Single Family	0.44%	718	3
230	Residential Condo	0.88%	0	0
220	Apartment	0.88%	0	0
150	Warehousing	27.00%	0	0
760	Research Center	1.84%	0	0
410	Park	0.44%	0	0
170	Utilities	30.00%	0	0
770	Business Park	1.84%	0	0
151	Mini Warehouse	7.00%	0	0
110	General Light Industry	8.00%	0	0
815	Discount Store	2.10%	0	0
0			0	0
Project Totals:			718	3
Project Truck %:			0.44%	

Vehicle Type	Total	
Automobiles	58.40%	
Light-Duty Trucks <3,750 pounds	17.69%	
Light-Duty Trucks 3,751-5,750 pounds	18.58%	
Medium-Duty Trucks 5,751-8,500 pounds	0.32%	} 0.44% Total Trucks
Light-Heavy-Duty Trucks 8,501-10,000 pounds	0.04%	
Light-Heavy-Duty Trucks 10,001-14,000 pounds	0.01%	
Medium-Heavy-Duty Trucks 14,001-33,000 pounds	0.04%	
Heavy-Heavy-Duty Trucks 33,001-60,000 pounds	0.03%	
Line-Haul Vehicles	0.00%	
Urban Buses	0.22%	
Motorcycles	1.67%	
School Buses	0.11%	
Motor Homes	2.89%	

URBEMIS 2002 For Windows 7.5.0

File Name: P:\Projects - All Users\10800-00+\10953-00 Lake Forest Opportunities Study EIR\EIR\A  
Project Name: City of Lake Forest EIR - Proposed Project Operational Emissions (Site 6)  
Project Location: South Coast Air Basin (Los Angeles area)  
On-Road Motor Vehicle Emissions Based on EMFAC2002 version 2.2

SUMMARY REPORT  
(Pounds/Day - Summer)

AREA SOURCE EMISSION ESTIMATES

	ROG	NOx	CO	SO2	PM10
TOTALS (lbs/day,unmitigated)	4.36	1.08	1.49	0.03	0.00

OPERATIONAL (VEHICLE) EMISSION ESTIMATES

	ROG	NOx	CO	SO2	PM10
TOTALS (lbs/day,unmitigated)	1.57	1.47	16.16	0.05	9.00

SUM OF AREA AND OPERATIONAL EMISSION ESTIMATES

	ROG	NOx	CO	SO2	PM10
TOTALS (lbs/day,unmitigated)	5.93	2.54	17.65	0.08	9.00

URBEMIS 2002 For Windows 7.5.0

File Name: P:\Projects - All Users\10800-00+\10953-00 Lake Forest Opportunities Study EIR\EIR\A  
Project Name: City of Lake Forest EIR - Proposed Project Operational Emissions (Site 6)  
Project Location: South Coast Air Basin (Los Angeles area)  
On-Road Motor Vehicle Emissions Based on EMFAC2002 version 2.2

SUMMARY REPORT  
(Pounds/Day - Winter)

AREA SOURCE EMISSION ESTIMATES

	ROG	NOx	CO	SO2	PM10
TOTALS (lbs/day,unmitigated)	4.24	1.07	0.45	0.00	0.00

OPERATIONAL (VEHICLE) EMISSION ESTIMATES

	ROG	NOx	CO	SO2	PM10
TOTALS (lbs/day,unmitigated)	1.66	1.91	17.80	0.04	9.00

SUM OF AREA AND OPERATIONAL EMISSION ESTIMATES

	ROG	NOx	CO	SO2	PM10
TOTALS (lbs/day,unmitigated)	5.90	2.97	18.25	0.04	9.00

URBEMIS 2002 For Windows 7.5.0

File Name: P:\Projects - All Users\10800-00+\10953-00 Lake Forest Opportunities Study EIR\EIR\A  
Project Name: City of Lake Forest EIR - Proposed Project Operational Emissions (Site 6)  
Project Location: South Coast Air Basin (Los Angeles area)  
On-Road Motor Vehicle Emissions Based on EMFAC2002 version 2.2

SUMMARY REPORT  
(Tons/Year)

AREA SOURCE EMISSION ESTIMATES

	ROG	NOx	CO	SO2	PM10
TOTALS (tpy, unmitigated)	0.78	0.20	0.18	0.00	0.00

OPERATIONAL (VEHICLE) EMISSION ESTIMATES

	ROG	NOx	CO	SO2	PM10
TOTALS (tpy, unmitigated)	0.29	0.29	3.05	0.01	1.64

SUM OF AREA AND OPERATIONAL EMISSION ESTIMATES

	ROG	NOx	CO	SO2	PM10
TOTALS (tpy, unmitigated)	1.08	0.49	3.22	0.01	1.64

URBEMIS 2002 For Windows 7.5.0

File Name: P:\Projects - All Users\10800-00+\10953-00 Lake Forest Opportunities Study EIR\EIR\A  
Project Name: City of Lake Forest EIR - Proposed Project Operational Emissions (Site 6)  
Project Location: South Coast Air Basin (Los Angeles area)  
On-Road Motor Vehicle Emissions Based on EMFAC2002 version 2.2

DETAIL REPORT  
(Pounds/Day - Winter)

AREA SOURCE EMISSION ESTIMATES (Winter Pounds per Day, Unmitigated)						
Source	ROG	NOx	CO	SO2	PM10	
Natural Gas	0.08	1.07	0.45	-	0.00	
Wood Stoves	0.00	0.00	0.00	0.00	0.00	
Fireplaces	0.00	0.00	0.00	0.00	0.00	
Landscaping - No winter emissions						
Consumer Prdcts	4.16	-	-	-	-	
TOTALS (lbs/day, unmitigated)	4.24	1.07	0.45	0.00	0.00	

UNMITIGATED OPERATIONAL EMISSIONS

	ROG	NOx	CO	SO2	PM10
Single family housing	1.66	1.91	17.80	0.04	9.00
TOTAL EMISSIONS (lbs/day)	1.66	1.91	17.80	0.04	9.00

Does not include correction for passby trips.  
 Does not include double counting adjustment for internal trips.

OPERATIONAL (Vehicle) EMISSION ESTIMATES

Analysis Year: 2030 Temperature (F): 50 Season: Winter

EMFAC Version: EMFAC2002 (9/2002)

Summary of Land Uses:

Unit Type	Trip Rate	Size	Total Trips
Single family housing	10.50 trips / dwelling units	85.00	892.50

Vehicle Assumptions:

Fleet Mix:

Vehicle Type	Percent Type	Non-Catalyst	Catalyst	Diesel
Light Auto	58.40	0.00	100.00	0.00
Light Truck < 3,750 lbs	17.69	0.00	100.00	0.00
Light Truck 3,751- 5,750	18.58	0.00	100.00	0.00
Med Truck 5,751- 8,500	0.32	0.00	100.00	0.00
Lite-Heavy 8,501-10,000	0.04	0.00	80.00	20.00
Lite-Heavy 10,001-14,000	0.01	0.00	66.70	33.30
Med-Heavy 14,001-33,000	0.04	0.00	22.20	77.80
Heavy-Heavy 33,001-60,000	0.03	0.00	0.00	100.00
Line Haul > 60,000 lbs	0.00	0.00	0.00	100.00
Urban Bus	0.22	0.00	50.00	50.00
Motorcycle	1.67	33.30	66.70	0.00
School Bus	0.11	0.00	0.00	100.00
Motor Home	2.89	0.00	92.30	7.70

Travel Conditions

	Residential			Commercial		
	Home-Work	Home-Shop	Home-Other	Commute	Non-Work	Customer
Urban Trip Length (miles)	11.5	4.9	6.0	10.3	5.5	5.5
Rural Trip Length (miles)	11.5	4.9	6.0	10.3	5.5	5.5
Trip Speeds (mph)	35.0	40.0	40.0	40.0	40.0	40.0
% of Trips - Residential	20.0	37.0	43.0			

Changes made to the default values for Land Use Trip Percentages

Changes made to the default values for Area

The wood stove option switch changed from on to off.  
The fireplcase option switch changed from on to off.

Changes made to the default values for Operations

The light auto percentage changed from 52.5 to 58.40.  
The light truck < 3750 lbs percentage changed from 15.9 to 17.69.  
The light truck 3751-5750 percentage changed from 16.7 to 18.58.  
The med truck 5751-8500 percentage changed from 7.6 to 0.32.  
The lite-heavy truck 8501-10000 percentage changed from 1.0 to 0.04.  
The lite-heavy truck 10001-14000 percentage changed from 0.3 to 0.01.  
The med-heavy truck 14001-33000 percentage changed from 0.9 to 0.04.  
The heavy-heavy truck 33001-60000 percentage changed from 0.7 to 0.03.  
The urban bus percentage changed from 0.2 to 0.22.  
The motorcycle percentage changed from 1.5 to 1.67.  
The school bus percentage changed from 0.1 to 0.11.  
The motorhome percentage changed from 2.6 to 2.89.  
The operational emission year changed from 2004 to 2030.  
The operational winter selection item changed from 3 to 2.  
The operational summer temperature changed from 90 to 75.  
The operational summer selection item changed from 8 to 5.  
The travel mode environment settings changed from both to: none

URBEMIS 2002 For Windows 7.5.0

File Name: P:\Projects - All Users\10800-00+\10953-00 Lake Forest Opportunities Study EIR\EIR\A  
Project Name: City of Lake Forest EIR - Proposed Project Operational Emissions (Site 6)  
Project Location: South Coast Air Basin (Los Angeles area)  
On-Road Motor Vehicle Emissions Based on EMFAC2002 version 2.2

DETAIL REPORT  
(Pounds/Day - Summer)

AREA SOURCE EMISSION ESTIMATES (Summer Pounds per Day, Unmitigated)					
Source	ROG	NOx	CO	SO2	PM10
Natural Gas	0.08	1.07	0.45	-	0.00
Wood Stoves - No summer emissions					
Fireplaces - No summer emissions					
Landscaping	0.12	0.01	1.04	0.03	0.00
Consumer Prdcts	4.16	-	-	-	-
TOTALS (lbs/day, unmitigated)	4.36	1.08	1.49	0.03	0.00

UNMITIGATED OPERATIONAL EMISSIONS

	ROG	NOx	CO	SO2	PM10
Single family housing	1.57	1.47	16.16	0.05	9.00
TOTAL EMISSIONS (lbs/day)	1.57	1.47	16.16	0.05	9.00

Does not include correction for passby trips.  
 Does not include double counting adjustment for internal trips.

OPERATIONAL (Vehicle) EMISSION ESTIMATES

Analysis Year: 2030 Temperature (F): 75 Season: Summer

EMFAC Version: EMFAC2002 (9/2002)

Summary of Land Uses:

Unit Type	Trip Rate	Size	Total Trips
Single family housing	10.50 trips / dwelling units	85.00	892.50

Vehicle Assumptions:

Fleet Mix:

Vehicle Type	Percent Type	Non-Catalyst	Catalyst	Diesel
Light Auto	58.40	0.00	100.00	0.00
Light Truck < 3,750 lbs	17.69	0.00	100.00	0.00
Light Truck 3,751- 5,750	18.58	0.00	100.00	0.00
Med Truck 5,751- 8,500	0.32	0.00	100.00	0.00
Lite-Heavy 8,501-10,000	0.04	0.00	80.00	20.00
Lite-Heavy 10,001-14,000	0.01	0.00	66.70	33.30
Med-Heavy 14,001-33,000	0.04	0.00	22.20	77.80
Heavy-Heavy 33,001-60,000	0.03	0.00	0.00	100.00
Line Haul > 60,000 lbs	0.00	0.00	0.00	100.00
Urban Bus	0.22	0.00	50.00	50.00
Motorcycle	1.67	33.30	66.70	0.00
School Bus	0.11	0.00	0.00	100.00
Motor Home	2.89	0.00	92.30	7.70

Travel Conditions

	Residential			Commercial		
	Home-Work	Home-Shop	Home-Other	Commute	Non-Work	Customer
Urban Trip Length (miles)	11.5	4.9	6.0	10.3	5.5	5.5
Rural Trip Length (miles)	11.5	4.9	6.0	10.3	5.5	5.5
Trip Speeds (mph)	35.0	40.0	40.0	40.0	40.0	40.0
% of Trips - Residential	20.0	37.0	43.0			

Changes made to the default values for Land Use Trip Percentages

Changes made to the default values for Area

The wood stove option switch changed from on to off.  
The fireplcase option switch changed from on to off.

Changes made to the default values for Operations

The light auto percentage changed from 52.5 to 58.40.  
The light truck < 3750 lbs percentage changed from 15.9 to 17.69.  
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The med truck 5751-8500 percentage changed from 7.6 to 0.32.  
The lite-heavy truck 8501-10000 percentage changed from 1.0 to 0.04.  
The lite-heavy truck 10001-14000 percentage changed from 0.3 to 0.01.  
The med-heavy truck 14001-33000 percentage changed from 0.9 to 0.04.  
The heavy-heavy truck 33001-60000 percentage changed from 0.7 to 0.03.  
The urban bus percentage changed from 0.2 to 0.22.  
The motorcycle percentage changed from 1.5 to 1.67.  
The school bus percentage changed from 0.1 to 0.11.  
The motorhome percentage changed from 2.6 to 2.89.  
The operational emission year changed from 2004 to 2030.  
The operational winter selection item changed from 3 to 2.  
The operational summer temperature changed from 90 to 75.  
The operational summer selection item changed from 8 to 5.  
The travel mode environment settings changed from both to: none

URBEMIS 2002 For Windows 7.5.0

File Name: P:\Projects - All Users\10800-00+\10953-00 Lake Forest Opportunities Study EIR\EIR\A  
Project Name: City of Lake Forest EIR - Proposed Project Operational Emissions (Site 6)  
Project Location: South Coast Air Basin (Los Angeles area)  
On-Road Motor Vehicle Emissions Based on EMFAC2002 version 2.2

DETAIL REPORT  
(Tons/Year)

AREA SOURCE EMISSION ESTIMATES

Source	ROG	NOx	CO	SO2	PM10
Natural Gas	0.02	0.19	0.08	-	0.00
Wood Stoves	0.00	0.00	0.00	0.00	0.00
Fireplaces	0.00	0.00	0.00	0.00	0.00
Landscaping	0.01	0.00	0.09	0.00	0.00
Consumer Prdcts	0.76	-	-	-	-
TOTALS (tpy, unmitigated)	0.78	0.20	0.18	0.00	0.00

UNMITIGATED OPERATIONAL EMISSIONS

	ROG	NOx	CO	SO2	PM10
Single family housing	0.29	0.29	3.05	0.01	1.64
TOTAL EMISSIONS (tons/yr)	0.29	0.29	3.05	0.01	1.64

Does not include correction for passby trips.  
 Does not include double counting adjustment for internal trips.

OPERATIONAL (Vehicle) EMISSION ESTIMATES

Analysis Year: 2030 Temperature (F): 75 Season: Annual

EMFAC Version: EMFAC2002 (9/2002)

Summary of Land Uses:

Unit Type	Trip Rate	Size	Total Trips
Single family housing	10.50 trips / dwelling units	85.00	892.50

Vehicle Assumptions:

Fleet Mix:

Vehicle Type	Percent Type	Non-Catalyst	Catalyst	Diesel
Light Auto	58.40	0.00	100.00	0.00
Light Truck < 3,750 lbs	17.69	0.00	100.00	0.00
Light Truck 3,751- 5,750	18.58	0.00	100.00	0.00
Med Truck 5,751- 8,500	0.32	0.00	100.00	0.00
Lite-Heavy 8,501-10,000	0.04	0.00	80.00	20.00
Lite-Heavy 10,001-14,000	0.01	0.00	66.70	33.30
Med-Heavy 14,001-33,000	0.04	0.00	22.20	77.80
Heavy-Heavy 33,001-60,000	0.03	0.00	0.00	100.00
Line Haul > 60,000 lbs	0.00	0.00	0.00	100.00
Urban Bus	0.22	0.00	50.00	50.00
Motorcycle	1.67	33.30	66.70	0.00
School Bus	0.11	0.00	0.00	100.00
Motor Home	2.89	0.00	92.30	7.70

Travel Conditions

	Residential			Commercial		
	Home-Work	Home-Shop	Home-Other	Commute	Non-Work	Customer
Urban Trip Length (miles)	11.5	4.9	6.0	10.3	5.5	5.5
Rural Trip Length (miles)	11.5	4.9	6.0	10.3	5.5	5.5
Trip Speeds (mph)	35.0	40.0	40.0	40.0	40.0	40.0
% of Trips - Residential	20.0	37.0	43.0			

Changes made to the default values for Land Use Trip Percentages

Changes made to the default values for Area

The wood stove option switch changed from on to off.  
The fireplcase option switch changed from on to off.

Changes made to the default values for Operations

The light auto percentage changed from 52.5 to 58.40.  
The light truck < 3750 lbs percentage changed from 15.9 to 17.69.  
The light truck 3751-5750 percentage changed from 16.7 to 18.58.  
The med truck 5751-8500 percentage changed from 7.6 to 0.32.  
The lite-heavy truck 8501-10000 percentage changed from 1.0 to 0.04.  
The lite-heavy truck 10001-14000 percentage changed from 0.3 to 0.01.  
The med-heavy truck 14001-33000 percentage changed from 0.9 to 0.04.  
The heavy-heavy truck 33001-60000 percentage changed from 0.7 to 0.03.  
The urban bus percentage changed from 0.2 to 0.22.  
The motorcycle percentage changed from 1.5 to 1.67.  
The school bus percentage changed from 0.1 to 0.11.  
The motorhome percentage changed from 2.6 to 2.89.  
The operational emission year changed from 2004 to 2030.  
The operational winter selection item changed from 3 to 2.  
The operational summer temperature changed from 90 to 75.  
The operational summer selection item changed from 8 to 5.  
The travel mode environment settings changed from both to: none

**EXPLANATION OF CHANGES MADE TO DEFAULT SETTINGS IN URBEMIS 2002**

**Project Number:** 10953-00

**Project Name:** City of Lake Forest Opportunities Study Program EIR - Proposed Project (Site 6)

The following pages include the printed results of the air pollutant emissions modeling for one of the land use components of the proposed project. The air emissions modeling was conducted using the URBEMIS 2002 for Windows computer program developed for the Yolo-Solano Air Quality Management District in May 2003. URBEMIS 2002 is programmed with EMFAC 2002 emission factors developed by the California Air Resources Board.

As part of this analysis, changes have been made to several of the default values programmed into URBEMIS 2002. These changes were made to more accurately reflect the nature of the proposed land use. Each of these changes are discussed below.

**Vehicle Trip Rates**

The default vehicle trip rate values were changed to be consistent with the traffic impact analysis prepared for the project.

**Vehicle Fleet Mix**

URBEMIS 2002 is programmed with the following state-wide average vehicle fleet mix:

State-Wide Vehicle Type	Total	
Automobiles	52.5%	
Light-Duty Trucks <3,750 pounds	15.9%	
Light-Duty Trucks 3,751-5,750 pounds	16.7%	
Medium-Duty Trucks 5,751-8,500 pounds	7.6%	} 10.50% Total Trucks
Light-Heavy-Duty Trucks 8,501-10,000 pounds	1.0%	
Light-Heavy-Duty Trucks 10,001-14,000 pounds	0.3%	
Medium-Heavy-Duty Trucks 14,001-33,000 pounds	0.9%	
Heavy-Heavy-Duty Trucks 33,001-60,000 pounds	0.7%	
Line-Haul Vehicles	0.0%	
Urban Buses	0.2%	
Motorcycles	1.5%	
School Buses	0.1%	
Motor Homes	2.6%	

However, this state-wide average fleet mix is not appropriate for the majority of land use analyses. The project land use assessed in this analysis is identified below along with the total percentage of trucks (medium and heavy) that are expected for this land use. The following vehicle mix was calculated based on the percentage of trucks associated with this land use. The percentage of trucks for each land use were determined from the 3rd, 4th, 5th, and 6th Editions of the ITE Trip Generation manual.

ITE Code	Project Land Use:	Truck %	ADT	Truck #
210	Single Family	0.44%	813	4
230	Residential Condo	0.88%	0	0
220	Apartment	0.88%	0	0
150	Warehousing	27.00%	0	0
760	Research Center	1.84%	0	0
410	Park	0.44%	0	0
170	Utilities	30.00%	0	0
770	Business Park	1.84%	0	0
151	Mini Warehouse	7.00%	0	0
110	General Light Industry	8.00%	0	0
815	Discount Store	2.10%	0	0
0			0	0
Project Totals:			813	4
Project Truck %:			0.44%	

Vehicle Type	Total	
Automobiles	58.40%	
Light-Duty Trucks <3,750 pounds	17.69%	
Light-Duty Trucks 3,751-5,750 pounds	18.58%	
Medium-Duty Trucks 5,751-8,500 pounds	0.32%	} 0.44% Total Trucks
Light-Heavy-Duty Trucks 8,501-10,000 pounds	0.04%	
Light-Heavy-Duty Trucks 10,001-14,000 pounds	0.01%	
Medium-Heavy-Duty Trucks 14,001-33,000 pounds	0.04%	
Heavy-Heavy-Duty Trucks 33,001-60,000 pounds	0.03%	
Line-Haul Vehicles	0.00%	
Urban Buses	0.22%	
Motorcycles	1.67%	
School Buses	0.11%	
Motor Homes	2.89%	

URBEMIS 2002 For Windows 7.5.0

File Name: P:\Projects - All Users\10800-00+\10953-00 Lake Forest Opportunities Study EIR\EIR\A  
Project Name: City of Lake Forest EIR - Proposed Project Operational Emissions (Site 7)  
Project Location: South Coast Air Basin (Los Angeles area)  
On-Road Motor Vehicle Emissions Based on EMFAC2002 version 2.2

SUMMARY REPORT  
(Pounds/Day - Summer)

AREA SOURCE EMISSION ESTIMATES

	ROG	NOx	CO	SO2	PM10
TOTALS (lbs/day,unmitigated)	0.77	8.32	4.49	0.00	0.02

OPERATIONAL (VEHICLE) EMISSION ESTIMATES

	ROG	NOx	CO	SO2	PM10
TOTALS (lbs/day,unmitigated)	34.03	36.02	378.41	1.14	218.21

SUM OF AREA AND OPERATIONAL EMISSION ESTIMATES

	ROG	NOx	CO	SO2	PM10
TOTALS (lbs/day,unmitigated)	34.80	44.34	382.90	1.14	218.23

URBEMIS 2002 For Windows 7.5.0

File Name: P:\Projects - All Users\10800-00+\10953-00 Lake Forest Opportunities Study EIR\EIR\A  
Project Name: City of Lake Forest EIR - Proposed Project Operational Emissions (Site 7)  
Project Location: South Coast Air Basin (Los Angeles area)  
On-Road Motor Vehicle Emissions Based on EMFAC2002 version 2.2

SUMMARY REPORT  
(Pounds/Day - Winter)

AREA SOURCE EMISSION ESTIMATES

	ROG	NOx	CO	SO2	PM10
TOTALS (lbs/day,unmitigated)	0.60	8.31	3.33	0.00	0.01

OPERATIONAL (VEHICLE) EMISSION ESTIMATES

	ROG	NOx	CO	SO2	PM10
TOTALS (lbs/day,unmitigated)	37.57	46.77	415.07	1.03	218.21

SUM OF AREA AND OPERATIONAL EMISSION ESTIMATES

	ROG	NOx	CO	SO2	PM10
TOTALS (lbs/day,unmitigated)	38.18	55.09	418.40	1.03	218.23

URBEMIS 2002 For Windows 7.5.0

File Name: P:\Projects - All Users\10800-00+\10953-00 Lake Forest Opportunities Study EIR\EIR\A  
Project Name: City of Lake Forest EIR - Proposed Project Operational Emissions (Site 7)  
Project Location: South Coast Air Basin (Los Angeles area)  
On-Road Motor Vehicle Emissions Based on EMFAC2002 version 2.2

SUMMARY REPORT  
(Tons/Year)

AREA SOURCE EMISSION ESTIMATES

	ROG	NOx	CO	SO2	PM10
TOTALS (tpy, unmitigated)	0.12	1.52	0.71	0.00	0.00

OPERATIONAL (VEHICLE) EMISSION ESTIMATES

	ROG	NOx	CO	SO2	PM10
TOTALS (tpy, unmitigated)	6.43	7.23	71.29	0.20	39.82

SUM OF AREA AND OPERATIONAL EMISSION ESTIMATES

	ROG	NOx	CO	SO2	PM10
TOTALS (tpy, unmitigated)	6.55	8.75	72.00	0.20	39.83

URBEMIS 2002 For Windows 7.5.0

File Name: P:\Projects - All Users\10800-00+\10953-00 Lake Forest Opportunities Study EIR\EIR\A  
Project Name: City of Lake Forest EIR - Proposed Project Operational Emissions (Site 7)  
Project Location: South Coast Air Basin (Los Angeles area)  
On-Road Motor Vehicle Emissions Based on EMFAC2002 version 2.2

DETAIL REPORT  
(Pounds/Day - Winter)

AREA SOURCE EMISSION ESTIMATES (Winter Pounds per Day, Unmitigated)					
Source	ROG	NOx	CO	SO2	PM10
Natural Gas	0.60	8.31	3.33	-	0.01
Wood Stoves	0.00	0.00	0.00	0.00	0.00
Fireplaces	0.00	0.00	0.00	0.00	0.00
Landscaping - No winter emissions					
Consumer Prdcts	0.00	-	-	-	-
TOTALS (lbs/day, unmitigated)	0.60	8.31	3.33	0.00	0.01

UNMITIGATED OPERATIONAL EMISSIONS

	ROG	NOx	CO	SO2	PM10
City park	2.97	3.70	32.86	0.08	16.86
Office park	25.05	31.14	276.31	0.70	146.74
Government office building	9.55	11.93	105.90	0.26	54.61
TOTAL EMISSIONS (lbs/day)	37.57	46.77	415.07	1.03	218.21

Does not include correction for passby trips.  
 Does not include double counting adjustment for internal trips.

OPERATIONAL (Vehicle) EMISSION ESTIMATES

Analysis Year: 2030 Temperature (F): 50 Season: Winter

EMFAC Version: EMFAC2002 (9/2002)

Summary of Land Uses:

Unit Type	Trip Rate	Size	Total Trips
City park	50.00 trips / acres	39.00	1,950.00
Office park	10.77 trips / 1000 sq. ft.	1,159.00	12,482.43
Government office building	68.90 trips / 1000 sq. ft.	88.00	6,063.20

Vehicle Assumptions:

Fleet Mix:

Vehicle Type	Percent Type	Non-Catalyst	Catalyst	Diesel
Light Auto	57.72	0.00	100.00	0.00
Light Truck < 3,750 lbs	17.48	0.00	100.00	0.00
Light Truck 3,751- 5,750	18.36	0.00	100.00	0.00
Med Truck 5,751- 8,500	1.17	0.00	100.00	0.00
Lite-Heavy 8,501-10,000	0.15	0.00	80.00	20.00
Lite-Heavy 10,001-14,000	0.04	0.00	66.70	33.30
Med-Heavy 14,001-33,000	0.15	0.00	22.20	77.80
Heavy-Heavy 33,001-60,000	0.11	0.00	0.00	100.00
Line Haul > 60,000 lbs	0.00	0.00	0.00	100.00
Urban Bus	0.22	0.00	50.00	50.00
Motorcycle	1.65	33.30	66.70	0.00
School Bus	0.11	0.00	0.00	100.00
Motor Home	2.84	0.00	92.30	7.70

Travel Conditions

	Residential			Commercial		
	Home-Work	Home-Shop	Home-Other	Commute	Non-Work	Customer
Urban Trip Length (miles)	11.5	4.9	6.0	10.3	5.5	5.5
Rural Trip Length (miles)	11.5	4.9	6.0	10.3	5.5	5.5
Trip Speeds (mph)	35.0	40.0	40.0	40.0	40.0	40.0
% of Trips - Residential	20.0	37.0	43.0			

% of Trips - Commercial (by land use)

City park	5.0	2.5	92.5
Office park	48.0	24.0	28.0
Government office building	10.0	5.0	85.0

Changes made to the default values for Land Use Trip Percentages

Changes made to the default values for Area

The wood stove option switch changed from on to off.  
The fireplcase option switch changed from on to off.  
The consumer products option switch changed from on to off.

Changes made to the default values for Operations

The light auto percentage changed from 52.5 to 57.72.  
The light truck < 3750 lbs percentage changed from 15.9 to 17.48.  
The light truck 3751-5750 percentage changed from 16.7 to 18.36.  
The med truck 5751-8500 percentage changed from 7.6 to 1.17.  
The lite-heavy truck 8501-10000 percentage changed from 1.0 to 0.15.  
The lite-heavy truck 10001-14000 percentage changed from 0.3 to 0.04.  
The med-heavy truck 14001-33000 percentage changed from 0.9 to 0.15.  
The heavy-heavy truck 33001-60000 percentage changed from 0.7 to 0.11.  
The urban bus percentage changed from 0.2 to 0.22.  
The motorcycle percentage changed from 1.5 to 1.65.  
The school bus percentage changed from 0.1 to 0.11.  
The motorhome percentage changed from 2.6 to 2.84.  
The operational emission year changed from 2004 to 2030.  
The operational winter selection item changed from 3 to 2.  
The operational summer temperature changed from 90 to 75.  
The operational summer selection item changed from 8 to 5.  
The travel mode environment settings changed from both to: none

URBEMIS 2002 For Windows 7.5.0

File Name: P:\Projects - All Users\10800-00+\10953-00 Lake Forest Opportunities Study EIR\EIR\A  
Project Name: City of Lake Forest EIR - Proposed Project Operational Emissions (Site 7)  
Project Location: South Coast Air Basin (Los Angeles area)  
On-Road Motor Vehicle Emissions Based on EMFAC2002 version 2.2

DETAIL REPORT  
(Pounds/Day - Summer)

AREA SOURCE EMISSION ESTIMATES (Summer Pounds per Day, Unmitigated)					
Source	ROG	NOx	CO	SO2	PM10
Natural Gas	0.60	8.31	3.33	-	0.01
Wood Stoves - No summer emissions					
Fireplaces - No summer emissions					
Landscaping	0.16	0.01	1.17	0.00	0.00
Consumer Prdcts	0.00	-	-	-	-
TOTALS (lbs/day, unmitigated)	0.77	8.32	4.49	0.00	0.02

UNMITIGATED OPERATIONAL EMISSIONS

	ROG	NOx	CO	SO2	PM10
City park	2.56	2.86	29.11	0.09	16.86
Office park	23.33	23.95	254.90	0.77	146.74
Government office building	8.14	9.21	94.40	0.29	54.61
TOTAL EMISSIONS (lbs/day)	34.03	36.02	378.41	1.14	218.21

Does not include correction for passby trips.  
 Does not include double counting adjustment for internal trips.

OPERATIONAL (Vehicle) EMISSION ESTIMATES

Analysis Year: 2030 Temperature (F): 75 Season: Summer

EMFAC Version: EMFAC2002 (9/2002)

Summary of Land Uses:

Unit Type	Trip Rate	Size	Total Trips
City park	50.00 trips / acres	39.00	1,950.00
Office park	10.77 trips / 1000 sq. ft.	1,159.00	12,482.43
Government office building	68.90 trips / 1000 sq. ft.	88.00	6,063.20

Vehicle Assumptions:

Fleet Mix:

Vehicle Type	Percent Type	Non-Catalyst	Catalyst	Diesel
Light Auto	57.72	0.00	100.00	0.00
Light Truck < 3,750 lbs	17.48	0.00	100.00	0.00
Light Truck 3,751- 5,750	18.36	0.00	100.00	0.00
Med Truck 5,751- 8,500	1.17	0.00	100.00	0.00
Lite-Heavy 8,501-10,000	0.15	0.00	80.00	20.00
Lite-Heavy 10,001-14,000	0.04	0.00	66.70	33.30
Med-Heavy 14,001-33,000	0.15	0.00	22.20	77.80
Heavy-Heavy 33,001-60,000	0.11	0.00	0.00	100.00
Line Haul > 60,000 lbs	0.00	0.00	0.00	100.00
Urban Bus	0.22	0.00	50.00	50.00
Motorcycle	1.65	33.30	66.70	0.00
School Bus	0.11	0.00	0.00	100.00
Motor Home	2.84	0.00	92.30	7.70

Travel Conditions

	Residential			Commercial		
	Home-Work	Home-Shop	Home-Other	Commute	Non-Work	Customer
Urban Trip Length (miles)	11.5	4.9	6.0	10.3	5.5	5.5
Rural Trip Length (miles)	11.5	4.9	6.0	10.3	5.5	5.5
Trip Speeds (mph)	35.0	40.0	40.0	40.0	40.0	40.0
% of Trips - Residential	20.0	37.0	43.0			

% of Trips - Commercial (by land use)

City park	5.0	2.5	92.5
Office park	48.0	24.0	28.0
Government office building	10.0	5.0	85.0

Changes made to the default values for Land Use Trip Percentages

Changes made to the default values for Area

The wood stove option switch changed from on to off.  
The fireplace option switch changed from on to off.  
The consumer products option switch changed from on to off.

Changes made to the default values for Operations

The light auto percentage changed from 52.5 to 57.72.  
The light truck < 3750 lbs percentage changed from 15.9 to 17.48.  
The light truck 3751-5750 percentage changed from 16.7 to 18.36.  
The med truck 5751-8500 percentage changed from 7.6 to 1.17.  
The lite-heavy truck 8501-10000 percentage changed from 1.0 to 0.15.  
The lite-heavy truck 10001-14000 percentage changed from 0.3 to 0.04.  
The med-heavy truck 14001-33000 percentage changed from 0.9 to 0.15.  
The heavy-heavy truck 33001-60000 percentage changed from 0.7 to 0.11.  
The urban bus percentage changed from 0.2 to 0.22.  
The motorcycle percentage changed from 1.5 to 1.65.  
The school bus percentage changed from 0.1 to 0.11.  
The motorhome percentage changed from 2.6 to 2.84.  
The operational emission year changed from 2004 to 2030.  
The operational winter selection item changed from 3 to 2.  
The operational summer temperature changed from 90 to 75.  
The operational summer selection item changed from 8 to 5.  
The travel mode environment settings changed from both to: none

URBEMIS 2002 For Windows 7.5.0

File Name: P:\Projects - All Users\10800-00+\10953-00 Lake Forest Opportunities Study EIR\EIR\A  
Project Name: City of Lake Forest EIR - Proposed Project Operational Emissions (Site 7)  
Project Location: South Coast Air Basin (Los Angeles area)  
On-Road Motor Vehicle Emissions Based on EMFAC2002 version 2.2

DETAIL REPORT  
(Tons/Year)

AREA SOURCE EMISSION ESTIMATES

Source	ROG	NOx	CO	SO2	PM10
Natural Gas	0.11	1.52	0.61	-	0.00
Wood Stoves	0.00	0.00	0.00	0.00	0.00
Fireplaces	0.00	0.00	0.00	0.00	0.00
Landscaping	0.01	0.00	0.11	0.00	0.00
Consumer Prdcts	0.00	-	-	-	-
TOTALS (tpy, unmitigated)	0.12	1.52	0.71	0.00	0.00

UNMITIGATED OPERATIONAL EMISSIONS

	ROG	NOx	CO	SO2	PM10
City park	0.49	0.57	5.54	0.02	3.08
Office park	4.36	4.81	47.82	0.14	26.78
Government office building	1.57	1.85	17.93	0.05	9.97
TOTAL EMISSIONS (tons/yr)	6.43	7.23	71.29	0.20	39.82

Does not include correction for passby trips.  
 Does not include double counting adjustment for internal trips.

OPERATIONAL (Vehicle) EMISSION ESTIMATES

Analysis Year: 2030 Temperature (F): 75 Season: Annual

EMFAC Version: EMFAC2002 (9/2002)

Summary of Land Uses:

Unit Type	Trip Rate	Size	Total Trips
City park	50.00 trips / acres	39.00	1,950.00
Office park	10.77 trips / 1000 sq. ft.	1,159.00	12,482.43
Government office building	68.90 trips / 1000 sq. ft.	88.00	6,063.20

Vehicle Assumptions:

Fleet Mix:

Vehicle Type	Percent Type	Non-Catalyst	Catalyst	Diesel
Light Auto	57.72	0.00	100.00	0.00
Light Truck < 3,750 lbs	17.48	0.00	100.00	0.00
Light Truck 3,751- 5,750	18.36	0.00	100.00	0.00
Med Truck 5,751- 8,500	1.17	0.00	100.00	0.00
Lite-Heavy 8,501-10,000	0.15	0.00	80.00	20.00
Lite-Heavy 10,001-14,000	0.04	0.00	66.70	33.30
Med-Heavy 14,001-33,000	0.15	0.00	22.20	77.80
Heavy-Heavy 33,001-60,000	0.11	0.00	0.00	100.00
Line Haul > 60,000 lbs	0.00	0.00	0.00	100.00
Urban Bus	0.22	0.00	50.00	50.00
Motorcycle	1.65	33.30	66.70	0.00
School Bus	0.11	0.00	0.00	100.00
Motor Home	2.84	0.00	92.30	7.70

Travel Conditions

	Residential			Commercial		
	Home-Work	Home-Shop	Home-Other	Commuter	Non-Work	Customer
Urban Trip Length (miles)	11.5	4.9	6.0	10.3	5.5	5.5
Rural Trip Length (miles)	11.5	4.9	6.0	10.3	5.5	5.5
Trip Speeds (mph)	35.0	40.0	40.0	40.0	40.0	40.0
% of Trips - Residential	20.0	37.0	43.0			

% of Trips - Commercial (by land use)

City park	5.0	2.5	92.5
Office park	48.0	24.0	28.0
Government office building	10.0	5.0	85.0

Changes made to the default values for Land Use Trip Percentages

Changes made to the default values for Area

The wood stove option switch changed from on to off.  
The fireplace option switch changed from on to off.  
The consumer products option switch changed from on to off.

Changes made to the default values for Operations

The light auto percentage changed from 52.5 to 57.72.  
The light truck < 3750 lbs percentage changed from 15.9 to 17.48.  
The light truck 3751-5750 percentage changed from 16.7 to 18.36.  
The med truck 5751-8500 percentage changed from 7.6 to 1.17.  
The lite-heavy truck 8501-10000 percentage changed from 1.0 to 0.15.  
The lite-heavy truck 10001-14000 percentage changed from 0.3 to 0.04.  
The med-heavy truck 14001-33000 percentage changed from 0.9 to 0.15.  
The heavy-heavy truck 33001-60000 percentage changed from 0.7 to 0.11.  
The urban bus percentage changed from 0.2 to 0.22.  
The motorcycle percentage changed from 1.5 to 1.65.  
The school bus percentage changed from 0.1 to 0.11.  
The motorhome percentage changed from 2.6 to 2.84.  
The operational emission year changed from 2004 to 2030.  
The operational winter selection item changed from 3 to 2.  
The operational summer temperature changed from 90 to 75.  
The operational summer selection item changed from 8 to 5.  
The travel mode environment settings changed from both to: none

**EXPLANATION OF CHANGES MADE TO DEFAULT SETTINGS IN URBEMIS 2002**

**Project Number:** 10953-00

**Project Name:** City of Lake Forest Opportunities Study Program EIR - Proposed Project (Site 7)

The following pages include the printed results of the air pollutant emissions modeling for one of the land use components of the proposed project. The air emissions modeling was conducted using the URBEMIS 2002 for Windows computer program developed for the Yolo-Solano Air Quality Management District in May 2003. URBEMIS 2002 is programmed with EMFAC 2002 emission factors developed by the California Air Resources Board.

As part of this analysis, changes have been made to several of the default values programmed into URBEMIS 2002. These changes were made to more accurately reflect the nature of the proposed land use. Each of these changes are discussed below.

**Vehicle Trip Rates**

The default vehicle trip rate values were changed to be consistent with the traffic impact analysis prepared for the project.

**Vehicle Fleet Mix**

URBEMIS 2002 is programmed with the following state-wide average vehicle fleet mix:

State-Wide Vehicle Type	Total	
Automobiles	58.4%	
Light-Duty Trucks <3,750 pounds	17.7%	
Light-Duty Trucks 3,751-5,750 pounds	18.6%	
Medium-Duty Trucks 5,751-8,500 pounds	0.3%	} 0.44% Total Trucks
Light-Heavy-Duty Trucks 8,501-10,000 pounds	0.0%	
Light-Heavy-Duty Trucks 10,001-14,000 pounds	0.0%	
Medium-Heavy-Duty Trucks 14,001-33,000 pounds	0.0%	
Heavy-Heavy-Duty Trucks 33,001-60,000 pounds	0.0%	
Line-Haul Vehicles	0.0%	
Urban Buses	0.2%	
Motorcycles	1.7%	
School Buses	0.1%	
Motor Homes	2.9%	

However, this state-wide average fleet mix is not appropriate for the majority of land use analyses. The project land use assessed in this analysis is identified below along with the total percentage of trucks (medium and heavy) that are expected for this land use. The following vehicle mix was calculated based on the percentage of trucks associated with this land use. The percentage of trucks for each land use were determined from the 3rd, 4th, 5th, and 6th Editions of the ITE Trip Generation manual.

ITE Code	Project Land Use:	Truck %	ADT	Truck #
730	Govt. Office Building	1.20%	2,457	29
770	Business Park	1.84%	14,788	272
410	Park	0.44%	2,098	9
0			0	0
0			0	0
0			0	0
0			0	0
0			0	0
0			0	0
0			0	0
0			0	0
0			0	0
Project Totals:			19,343	311
Project Truck %:			1.61%	

Vehicle Type	Total	
Automobiles	57.72%	
Light-Duty Trucks <3,750 pounds	17.48%	
Light-Duty Trucks 3,751-5,750 pounds	18.36%	
Medium-Duty Trucks 5,751-8,500 pounds	1.17%	} 1.61% Total Trucks
Light-Heavy-Duty Trucks 8,501-10,000 pounds	0.15%	
Light-Heavy-Duty Trucks 10,001-14,000 pounds	0.04%	
Medium-Heavy-Duty Trucks 14,001-33,000 pounds	0.15%	
Heavy-Heavy-Duty Trucks 33,001-60,000 pounds	0.11%	
Line-Haul Vehicles	0.00%	
Urban Buses	0.22%	
Motorcycles	1.65%	
School Buses	0.11%	
Motor Homes	2.86%	



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**URBEMIS 2002—Existing General Plan**

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URBEMIS 2002 For Windows 7.5.0

File Name: P:\Projects - All Users\10800-00+\10953-00 Lake Forest Opportunities Study EIR\EIR\A  
Project Name: City of Lake Forest EIR - Existing General Plan Operational Emissions (Site 1)  
Project Location: South Coast Air Basin (Los Angeles area)  
On-Road Motor Vehicle Emissions Based on EMFAC2002 version 2.2

SUMMARY REPORT  
(Pounds/Day - Summer)

AREA SOURCE EMISSION ESTIMATES

	ROG	NOx	CO	SO2	PM10
TOTALS (lbs/day,unmitigated)	2.17	27.66	12.23	0.00	0.05

OPERATIONAL (VEHICLE) EMISSION ESTIMATES

	ROG	NOx	CO	SO2	PM10
TOTALS (lbs/day,unmitigated)	88.90	89.53	943.63	2.86	543.40

SUM OF AREA AND OPERATIONAL EMISSION ESTIMATES

	ROG	NOx	CO	SO2	PM10
TOTALS (lbs/day,unmitigated)	91.08	117.19	955.86	2.86	543.46

URBEMIS 2002 For Windows 7.5.0

File Name: P:\Projects - All Users\10800-00+\10953-00 Lake Forest Opportunities Study EIR\EIR\A  
Project Name: City of Lake Forest EIR - Existing General Plan Operational Emissions (Site 1)  
Project Location: South Coast Air Basin (Los Angeles area)  
On-Road Motor Vehicle Emissions Based on EMFAC2002 version 2.2

SUMMARY REPORT  
(Pounds/Day - Winter)

AREA SOURCE EMISSION ESTIMATES

	ROG	NOx	CO	SO2	PM10
TOTALS (lbs/day,unmitigated)	2.01	27.65	11.06	0.00	0.05

OPERATIONAL (VEHICLE) EMISSION ESTIMATES

	ROG	NOx	CO	SO2	PM10
TOTALS (lbs/day,unmitigated)	93.47	116.28	1,026.48	2.58	543.40

SUM OF AREA AND OPERATIONAL EMISSION ESTIMATES

	ROG	NOx	CO	SO2	PM10
TOTALS (lbs/day,unmitigated)	95.48	143.93	1,037.54	2.58	543.45

URBEMIS 2002 For Windows 7.5.0

File Name: P:\Projects - All Users\10800-00+\10953-00 Lake Forest Opportunities Study EIR\EIR\A  
Project Name: City of Lake Forest EIR - Existing General Plan Operational Emissions (Site 1)  
Project Location: South Coast Air Basin (Los Angeles area)  
On-Road Motor Vehicle Emissions Based on EMFAC2002 version 2.2

SUMMARY REPORT  
(Tons/Year)

AREA SOURCE EMISSION ESTIMATES

	ROG	NOx	CO	SO2	PM10
TOTALS (tpy, unmitigated)	0.38	5.05	2.12	0.00	0.01

OPERATIONAL (VEHICLE) EMISSION ESTIMATES

	ROG	NOx	CO	SO2	PM10
TOTALS (tpy, unmitigated)	16.50	17.97	177.25	0.51	99.17

SUM OF AREA AND OPERATIONAL EMISSION ESTIMATES

	ROG	NOx	CO	SO2	PM10
TOTALS (tpy, unmitigated)	16.88	23.01	179.38	0.51	99.18

URBEMIS 2002 For Windows 7.5.0

File Name: P:\Projects - All Users\10800-00+\10953-00 Lake Forest Opportunities Study EIR\EIR\A  
Project Name: City of Lake Forest EIR - Existing General Plan Operational Emissions (Site 1)  
Project Location: South Coast Air Basin (Los Angeles area)  
On-Road Motor Vehicle Emissions Based on EMFAC2002 version 2.2

DETAIL REPORT  
(Pounds/Day - Winter)

AREA SOURCE EMISSION ESTIMATES (Winter Pounds per Day, Unmitigated)						
Source	ROG	NOx	CO	SO2	PM10	
Natural Gas	2.01	27.65	11.06	-	0.05	
Wood Stoves	0.00	0.00	0.00	0.00	0.00	
Fireplaces	0.00	0.00	0.00	0.00	0.00	
Landscaping - No winter emissions						
Consumer Prdcts	0.00	-	-	-	-	
TOTALS (lbs/day, unmitigated)	2.01	27.65	11.06	0.00	0.05	

UNMITIGATED OPERATIONAL EMISSIONS

	ROG	NOx	CO	SO2	PM10
City park	1.30	1.62	14.33	0.03	7.35
Office park	85.06	106.22	937.66	2.37	497.97
Warehouse	7.12	8.44	74.50	0.18	38.09
TOTAL EMISSIONS (lbs/day)	93.47	116.28	1,026.48	2.58	543.40

Does not include correction for passby trips.  
 Does not include double counting adjustment for internal trips.

OPERATIONAL (Vehicle) EMISSION ESTIMATES

Analysis Year: 2030 Temperature (F): 50 Season: Winter

EMFAC Version: EMFAC2002 (9/2002)

Summary of Land Uses:

Unit Type	Trip Rate	Size	Total Trips
City park	50.00 trips / acres	17.00	850.00
Office park	10.52 trips / 1000 sq. ft.	4,026.20	42,355.63
Warehouse	3.99 trips / 1000 sq. ft.	1,132.56	4,518.91

Vehicle Assumptions:

Fleet Mix:

Vehicle Type	Percent Type	Non-Catalyst	Catalyst	Diesel
Light Auto	57.52	0.00	100.00	0.00
Light Truck < 3,750 lbs	17.42	0.00	100.00	0.00
Light Truck 3,751- 5,750	18.30	0.00	100.00	0.00
Med Truck 5,751- 8,500	1.40	0.00	100.00	0.00
Lite-Heavy 8,501-10,000	0.18	0.00	80.00	20.00
Lite-Heavy 10,001-14,000	0.06	0.00	66.70	33.30
Med-Heavy 14,001-33,000	0.17	0.00	22.20	77.80
Heavy-Heavy 33,001-60,000	0.13	0.00	0.00	100.00
Line Haul > 60,000 lbs	0.00	0.00	0.00	100.00
Urban Bus	0.22	0.00	50.00	50.00
Motorcycle	1.64	33.30	66.70	0.00
School Bus	0.11	0.00	0.00	100.00
Motor Home	2.85	0.00	92.30	7.70

Travel Conditions

	Residential			Commercial		
	Home-Work	Home-Shop	Home-Other	Commute	Non-Work	Customer
Urban Trip Length (miles)	11.5	4.9	6.0	10.3	5.5	5.5
Rural Trip Length (miles)	11.5	4.9	6.0	10.3	5.5	5.5
Trip Speeds (mph)	35.0	40.0	40.0	40.0	40.0	40.0
% of Trips - Residential	20.0	37.0	43.0			

% of Trips - Commercial (by land use)

City park	5.0	2.5	92.5
Office park	48.0	24.0	28.0
Warehouse	2.0	1.0	97.0

Changes made to the default values for Land Use Trip Percentages

Changes made to the default values for Area

The wood stove option switch changed from on to off.  
The fireplace option switch changed from on to off.  
The consumer products option switch changed from on to off.

Changes made to the default values for Operations

The light auto percentage changed from 52.5 to 57.52.  
The light truck < 3750 lbs percentage changed from 15.9 to 17.42.  
The light truck 3751-5750 percentage changed from 16.7 to 18.30.  
The med truck 5751-8500 percentage changed from 7.6 to 1.40.  
The lite-heavy truck 8501-10000 percentage changed from 1.0 to 0.18.  
The lite-heavy truck 10001-14000 percentage changed from 0.3 to 0.06.  
The med-heavy truck 14001-33000 percentage changed from 0.9 to 0.17.  
The heavy-heavy truck 33001-60000 percentage changed from 0.7 to 0.13.  
The urban bus percentage changed from 0.2 to 0.22.  
The motorcycle percentage changed from 1.5 to 1.64.  
The school bus percentage changed from 0.1 to 0.11.  
The motorhome percentage changed from 2.6 to 2.85.  
The operational emission year changed from 2004 to 2030.  
The operational winter selection item changed from 3 to 2.  
The operational summer temperature changed from 90 to 75.  
The operational summer selection item changed from 8 to 5.  
The travel mode environment settings changed from both to: none

URBEMIS 2002 For Windows 7.5.0

File Name: P:\Projects - All Users\10800-00+\10953-00 Lake Forest Opportunities Study EIR\EIR\A  
Project Name: City of Lake Forest EIR - Existing General Plan Operational Emissions (Site 1)  
Project Location: South Coast Air Basin (Los Angeles area)  
On-Road Motor Vehicle Emissions Based on EMFAC2002 version 2.2

DETAIL REPORT  
(Pounds/Day - Summer)

AREA SOURCE EMISSION ESTIMATES (Summer Pounds per Day, Unmitigated)						
Source	ROG	NOx	CO	SO2	PM10	
Natural Gas	2.01	27.65	11.06	-	0.05	
Wood Stoves - No summer emissions						
Fireplaces - No summer emissions						
Landscaping	0.16	0.01	1.17	0.00	0.00	
Consumer Prdcts	0.00	-	-	-	-	
TOTALS (lbs/day, unmitigated)	2.17	27.66	12.23	0.00	0.05	

UNMITIGATED OPERATIONAL EMISSIONS

	ROG	NOx	CO	SO2	PM10
City park	1.12	1.25	12.69	0.04	7.35
Office park	79.43	81.75	865.18	2.63	497.97
Warehouse	8.36	6.52	65.75	0.20	38.09
TOTAL EMISSIONS (lbs/day)	88.90	89.53	943.63	2.86	543.40

Does not include correction for passby trips.  
 Does not include double counting adjustment for internal trips.

OPERATIONAL (Vehicle) EMISSION ESTIMATES

Analysis Year: 2030 Temperature (F): 75 Season: Summer

EMFAC Version: EMFAC2002 (9/2002)

Summary of Land Uses:

Unit Type	Trip Rate	Size	Total Trips
City park	50.00 trips / acres	17.00	850.00
Office park	10.52 trips / 1000 sq. ft.	4,026.20	42,355.63
Warehouse	3.99 trips / 1000 sq. ft.	1,132.56	4,518.91

Vehicle Assumptions:

Fleet Mix:

Vehicle Type	Percent Type	Non-Catalyst	Catalyst	Diesel
Light Auto	57.52	0.00	100.00	0.00
Light Truck < 3,750 lbs	17.42	0.00	100.00	0.00
Light Truck 3,751- 5,750	18.30	0.00	100.00	0.00
Med Truck 5,751- 8,500	1.40	0.00	100.00	0.00
Lite-Heavy 8,501-10,000	0.18	0.00	80.00	20.00
Lite-Heavy 10,001-14,000	0.06	0.00	66.70	33.30
Med-Heavy 14,001-33,000	0.17	0.00	22.20	77.80
Heavy-Heavy 33,001-60,000	0.13	0.00	0.00	100.00
Line Haul > 60,000 lbs	0.00	0.00	0.00	100.00
Urban Bus	0.22	0.00	50.00	50.00
Motorcycle	1.64	33.30	66.70	0.00
School Bus	0.11	0.00	0.00	100.00
Motor Home	2.85	0.00	92.30	7.70

Travel Conditions

	Residential			Commercial		
	Home-Work	Home-Shop	Home-Other	Commute	Non-Work	Customer
Urban Trip Length (miles)	11.5	4.9	6.0	10.3	5.5	5.5
Rural Trip Length (miles)	11.5	4.9	6.0	10.3	5.5	5.5
Trip Speeds (mph)	35.0	40.0	40.0	40.0	40.0	40.0
% of Trips - Residential	20.0	37.0	43.0			
% of Trips - Commercial (by land use)						
City park				5.0	2.5	92.5
Office park				48.0	24.0	28.0
Warehouse				2.0	1.0	97.0

Changes made to the default values for Land Use Trip Percentages

Changes made to the default values for Area

The wood stove option switch changed from on to off.  
The fireplace option switch changed from on to off.  
The consumer products option switch changed from on to off.

Changes made to the default values for Operations

The light auto percentage changed from 52.5 to 57.52.  
The light truck < 3750 lbs percentage changed from 15.9 to 17.42.  
The light truck 3751-5750 percentage changed from 16.7 to 18.30.  
The med truck 5751-8500 percentage changed from 7.6 to 1.40.  
The lite-heavy truck 8501-10000 percentage changed from 1.0 to 0.18.  
The lite-heavy truck 10001-14000 percentage changed from 0.3 to 0.06.  
The med-heavy truck 14001-33000 percentage changed from 0.9 to 0.17.  
The heavy-heavy truck 33001-60000 percentage changed from 0.7 to 0.13.  
The urban bus percentage changed from 0.2 to 0.22.  
The motorcycle percentage changed from 1.5 to 1.64.  
The school bus percentage changed from 0.1 to 0.11.  
The motorhome percentage changed from 2.6 to 2.85.  
The operational emission year changed from 2004 to 2030.  
The operational winter selection item changed from 3 to 2.  
The operational summer temperature changed from 90 to 75.  
The operational summer selection item changed from 8 to 5.  
The travel mode environment settings changed from both to: none

URBEMIS 2002 For Windows 7.5.0

File Name: P:\Projects - All Users\10800-00+\10953-00 Lake Forest Opportunities Study EIR\EIR\A  
Project Name: City of Lake Forest EIR - Existing General Plan Operational Emissions (Site 1)  
Project Location: South Coast Air Basin (Los Angeles area)  
On-Road Motor Vehicle Emissions Based on EMFAC2002 version 2.2

DETAIL REPORT  
(Tons/Year)

AREA SOURCE EMISSION ESTIMATES

Source	ROG	NOx	CO	SO2	PM10
Natural Gas	0.37	5.05	2.02	-	0.01
Wood Stoves	0.00	0.00	0.00	0.00	0.00
Fireplaces	0.00	0.00	0.00	0.00	0.00
Landscaping	0.01	0.00	0.11	0.00	0.00
Consumer Prdcts	0.00	-	-	-	-
TOTALS (tpy, unmitigated)	0.38	5.05	2.12	0.00	0.01

UNMITIGATED OPERATIONAL EMISSIONS

	ROG	NOx	CO	SO2	PM10
City park	0.21	0.25	2.42	0.01	1.34
Office park	14.84	16.41	162.30	0.46	90.88
Warehouse	1.45	1.31	12.53	0.04	6.95
TOTAL EMISSIONS (tons/yr)	16.50	17.97	177.25	0.51	99.17

Does not include correction for passby trips.  
 Does not include double counting adjustment for internal trips.

OPERATIONAL (Vehicle) EMISSION ESTIMATES

Analysis Year: 2030 Temperature (F): 75 Season: Annual

EMFAC Version: EMFAC2002 (9/2002)

Summary of Land Uses:

Unit Type	Trip Rate	Size	Total Trips
City park	50.00 trips / acres	17.00	850.00
Office park	10.52 trips / 1000 sq. ft.	4,026.20	42,355.63
Warehouse	3.99 trips / 1000 sq. ft.	1,132.56	4,518.91

Vehicle Assumptions:

Fleet Mix:

Vehicle Type	Percent Type	Non-Catalyst	Catalyst	Diesel
Light Auto	57.52	0.00	100.00	0.00
Light Truck < 3,750 lbs	17.42	0.00	100.00	0.00
Light Truck 3,751- 5,750	18.30	0.00	100.00	0.00
Med Truck 5,751- 8,500	1.40	0.00	100.00	0.00
Lite-Heavy 8,501-10,000	0.18	0.00	80.00	20.00
Lite-Heavy 10,001-14,000	0.06	0.00	66.70	33.30
Med-Heavy 14,001-33,000	0.17	0.00	22.20	77.80
Heavy-Heavy 33,001-60,000	0.13	0.00	0.00	100.00
Line Haul > 60,000 lbs	0.00	0.00	0.00	100.00
Urban Bus	0.22	0.00	50.00	50.00
Motorcycle	1.64	33.30	66.70	0.00
School Bus	0.11	0.00	0.00	100.00
Motor Home	2.85	0.00	92.30	7.70

Travel Conditions

	Residential			Commercial		
	Home-Work	Home-Shop	Home-Other	Commute	Non-Work	Customer
Urban Trip Length (miles)	11.5	4.9	6.0	10.3	5.5	5.5
Rural Trip Length (miles)	11.5	4.9	6.0	10.3	5.5	5.5
Trip Speeds (mph)	35.0	40.0	40.0	40.0	40.0	40.0
% of Trips - Residential	20.0	37.0	43.0			

% of Trips - Commercial (by land use)

City park	5.0	2.5	92.5
Office park	48.0	24.0	28.0
Warehouse	2.0	1.0	97.0

Changes made to the default values for Land Use Trip Percentages

Changes made to the default values for Area

The wood stove option switch changed from on to off.  
The fireplcase option switch changed from on to off.  
The consumer products option switch changed from on to off.

Changes made to the default values for Operations

The light auto percentage changed from 52.5 to 57.52.  
The light truck < 3750 lbs percentage changed from 15.9 to 17.42.  
The light truck 3751-5750 percentage changed from 16.7 to 18.30.  
The med truck 5751-8500 percentage changed from 7.6 to 1.40.  
The lite-heavy truck 8501-10000 percentage changed from 1.0 to 0.18.  
The lite-heavy truck 10001-14000 percentage changed from 0.3 to 0.06.  
The med-heavy truck 14001-33000 percentage changed from 0.9 to 0.17.  
The heavy-heavy truck 33001-60000 percentage changed from 0.7 to 0.13.  
The urban bus percentage changed from 0.2 to 0.22.  
The motorcycle percentage changed from 1.5 to 1.64.  
The school bus percentage changed from 0.1 to 0.11.  
The motorhome percentage changed from 2.6 to 2.85.  
The operational emission year changed from 2004 to 2030.  
The operational winter selection item changed from 3 to 2.  
The operational summer temperature changed from 90 to 75.  
The operational summer selection item changed from 8 to 5.  
The travel mode environment settings changed from both to: none

**EXPLANATION OF CHANGES MADE TO DEFAULT SETTINGS IN URBEMIS 2002**

**Project Number:** 10953-00

**Project Name:** City of Lake Forest Opportunities Study Program EIR - Existing General Plan (Site 1)

The following pages include the printed results of the air pollutant emissions modeling for one of the land use components of the proposed project. The air emissions modeling was conducted using the URBEMIS 2002 for Windows computer program developed for the Yolo-Solano Air Quality Management District in May 2003. URBEMIS 2002 is programmed with EMFAC 2002 emission factors developed by the California Air Resources Board.

As part of this analysis, changes have been made to several of the default values programmed into URBEMIS 2002. These changes were made to more accurately reflect the nature of the proposed land use. Each of these changes are discussed below.

**Vehicle Trip Rates**

The default vehicle trip rate values were changed to be consistent with the traffic impact analysis prepared for the project.

**Vehicle Fleet Mix**

URBEMIS 2002 is programmed with the following state-wide average vehicle fleet mix:

State-Wide Vehicle Type	Total	
Automobiles	52.5%	
Light-Duty Trucks <3,750 pounds	15.9%	
Light-Duty Trucks 3,751-5,750 pounds	16.7%	
Medium-Duty Trucks 5,751-8,500 pounds	7.6%	} 10.50% Total Trucks
Light-Heavy-Duty Trucks 8,501-10,000 pounds	1.0%	
Light-Heavy-Duty Trucks 10,001-14,000 pounds	0.3%	
Medium-Heavy-Duty Trucks 14,001-33,000 pounds	0.9%	
Heavy-Heavy-Duty Trucks 33,001-60,000 pounds	0.7%	
Line-Haul Vehicles	0.0%	
Urban Buses	0.2%	
Motorcycles	1.5%	
School Buses	0.1%	
Motor Homes	2.6%	

However, this state-wide average fleet mix is not appropriate for the majority of land use analyses. The project land use assessed in this analysis is identified below along with the total percentage of trucks (medium and heavy) that are expected for this land use. The following vehicle mix was calculated based on the percentage of trucks associated with this land use. The percentage of trucks for each land use were determined from the 3rd, 4th, 5th, and 6th Editions of the ITE Trip Generation manual.

ITE Code	Project Land Use:	Truck %	ADT	Truck #
210	Single Family	0.44%	0	0
230	Residential Condo	0.88%	0	0
220	Apartment	0.88%	0	0
150	Warehousing	27.00%	0	0
760	Research Center	1.84%	0	0
410	Park	0.44%	27	0
170	Utilities	30.00%	0	0
770	Business Park	1.84%	51,375	945
151	Mini Warehouse	7.00%	1,011	71
110	General Light Industry	8.00%	0	0
0			0	0
0			0	0
Project Totals:			52,413	1,016
Project Truck %:			1.94%	

Vehicle Type	Total	
Automobiles	57.52%	
Light-Duty Trucks <3,750 pounds	17.42%	
Light-Duty Trucks 3,751-5,750 pounds	18.30%	
Medium-Duty Trucks 5,751-8,500 pounds	1.40%	} 1.94% Total Trucks
Light-Heavy-Duty Trucks 8,501-10,000 pounds	0.18%	
Light-Heavy-Duty Trucks 10,001-14,000 pounds	0.06%	
Medium-Heavy-Duty Trucks 14,001-33,000 pounds	0.17%	
Heavy-Heavy-Duty Trucks 33,001-60,000 pounds	0.13%	
Line-Haul Vehicles	0.00%	
Urban Buses	0.22%	
Motorcycles	1.64%	
School Buses	0.11%	
Motor Homes	2.85%	

URBEMIS 2002 For Windows 7.5.0

File Name: P:\Projects - All Users\10800-00+\10953-00 Lake Forest Opportunities Study EIR\EIR\A  
Project Name: City of Lake Forest EIR - Existing General Plan Operational Emissions (Site 2)  
Project Location: South Coast Air Basin (Los Angeles area)  
On-Road Motor Vehicle Emissions Based on EMFAC2002 version 2.2

SUMMARY REPORT  
(Pounds/Day - Summer)

AREA SOURCE EMISSION ESTIMATES

	ROG	NOx	CO	SO2	PM10
TOTALS (lbs/day,unmitigated)	1.61	19.96	9.15	0.00	0.04

OPERATIONAL (VEHICLE) EMISSION ESTIMATES

	ROG	NOx	CO	SO2	PM10
TOTALS (lbs/day,unmitigated)	113.33	124.59	1,280.58	3.88	739.97

SUM OF AREA AND OPERATIONAL EMISSION ESTIMATES

	ROG	NOx	CO	SO2	PM10
TOTALS (lbs/day,unmitigated)	114.95	144.54	1,289.73	3.88	740.01

URBEMIS 2002 For Windows 7.5.0

File Name: P:\Projects - All Users\10800-00+\10953-00 Lake Forest Opportunities Study EIR\EIR\A  
Project Name: City of Lake Forest EIR - Existing General Plan Operational Emissions (Site 2)  
Project Location: South Coast Air Basin (Los Angeles area)  
On-Road Motor Vehicle Emissions Based on EMFAC2002 version 2.2

SUMMARY REPORT  
(Pounds/Day - Winter)

AREA SOURCE EMISSION ESTIMATES

	ROG	NOx	CO	SO2	PM10
TOTALS (lbs/day,unmitigated)	1.45	19.94	7.98	0.00	0.04

OPERATIONAL (VEHICLE) EMISSION ESTIMATES

	ROG	NOx	CO	SO2	PM10
TOTALS (lbs/day,unmitigated)	128.93	161.42	1,425.30	3.50	739.97

SUM OF AREA AND OPERATIONAL EMISSION ESTIMATES

	ROG	NOx	CO	SO2	PM10
TOTALS (lbs/day,unmitigated)	130.37	181.37	1,433.28	3.50	740.00

URBEMIS 2002 For Windows 7.5.0

File Name: P:\Projects - All Users\10800-00+\10953-00 Lake Forest Opportunities Study EIR\EIR\A  
Project Name: City of Lake Forest EIR - Existing General Plan Operational Emissions (Site 2)  
Project Location: South Coast Air Basin (Los Angeles area)  
On-Road Motor Vehicle Emissions Based on EMFAC2002 version 2.2

SUMMARY REPORT  
(Tons/Year)

AREA SOURCE EMISSION ESTIMATES

	ROG	NOx	CO	SO2	PM10
TOTALS (tpy, unmitigated)	0.28	3.64	1.56	0.00	0.01

OPERATIONAL (VEHICLE) EMISSION ESTIMATES

	ROG	NOx	CO	SO2	PM10
TOTALS (tpy, unmitigated)	21.63	24.98	242.51	0.68	135.04

SUM OF AREA AND OPERATIONAL EMISSION ESTIMATES

	ROG	NOx	CO	SO2	PM10
TOTALS (tpy, unmitigated)	21.91	28.62	244.07	0.68	135.05

URBEMIS 2002 For Windows 7.5.0

File Name: P:\Projects - All Users\10800-00+\10953-00 Lake Forest Opportunities Study EIR\EIR\A  
Project Name: City of Lake Forest EIR - Existing General Plan Operational Emissions (Site 2)  
Project Location: South Coast Air Basin (Los Angeles area)  
On-Road Motor Vehicle Emissions Based on EMFAC2002 version 2.2

DETAIL REPORT  
(Pounds/Day - Winter)

AREA SOURCE EMISSION ESTIMATES (Winter Pounds per Day, Unmitigated)						
Source	ROG	NOx	CO	SO2	PM10	
Natural Gas	1.45	19.94	7.98	-	0.04	
Wood Stoves	0.00	0.00	0.00	0.00	0.00	
Fireplaces	0.00	0.00	0.00	0.00	0.00	
Landscaping - No winter emissions						
Consumer Prdcts	0.00	-	-	-	-	
TOTALS (lbs/day, unmitigated)	1.45	19.94	7.98	0.00	0.04	

UNMITIGATED OPERATIONAL EMISSIONS

	ROG	NOx	CO	SO2	PM10
Free-standing discount st	78.00	97.83	863.84	2.08	441.76
Office park	50.92	63.59	561.46	1.42	298.21
TOTAL EMISSIONS (lbs/day)	128.93	161.42	1,425.30	3.50	739.97

Does not include correction for passby trips.  
 Does not include double counting adjustment for internal trips.

OPERATIONAL (Vehicle) EMISSION ESTIMATES

Analysis Year: 2030 Temperature (F): 50 Season: Winter

EMFAC Version: EMFAC2002 (9/2002)

Summary of Land Uses:

Unit Type	Trip Rate	Size	Total Trips
Free-standing discount st	127.43 trips / 1000 sq. ft.	411.27	52,408.14
Office park	10.59 trips / 1000 sq. ft.	2,395.20	25,365.17

Vehicle Assumptions:

Fleet Mix:

Vehicle Type	Percent Type	Non-Catalyst	Catalyst	Diesel
Light Auto	57.53	0.00	100.00	0.00
Light Truck < 3,750 lbs	17.42	0.00	100.00	0.00
Light Truck 3,751- 5,750	18.30	0.00	100.00	0.00
Med Truck 5,751- 8,500	1.40	0.00	100.00	0.00
Lite-Heavy 8,501-10,000	0.18	0.00	80.00	20.00
Lite-Heavy 10,001-14,000	0.06	0.00	66.70	33.30
Med-Heavy 14,001-33,000	0.17	0.00	22.20	77.80
Heavy-Heavy 33,001-60,000	0.13	0.00	0.00	100.00
Line Haul > 60,000 lbs	0.00	0.00	0.00	100.00
Urban Bus	0.22	0.00	50.00	50.00
Motorcycle	1.64	33.30	66.70	0.00
School Bus	0.11	0.00	0.00	100.00
Motor Home	2.84	0.00	92.30	7.70

Travel Conditions

	Residential			Commercial		
	Home-Work	Home-Shop	Home-Other	Commute	Non-Work	Customer
Urban Trip Length (miles)	11.5	4.9	6.0	10.3	5.5	5.5
Rural Trip Length (miles)	11.5	4.9	6.0	10.3	5.5	5.5
Trip Speeds (mph)	35.0	40.0	40.0	40.0	40.0	40.0
% of Trips - Residential	20.0	37.0	43.0			

% of Trips - Commercial (by land use)

Free-standing discount store	2.0	1.0	97.0
Office park	48.0	24.0	28.0

Changes made to the default values for Land Use Trip Percentages

Changes made to the default values for Area

The wood stove option switch changed from on to off.  
The fireplcase option switch changed from on to off.  
The consumer products option switch changed from on to off.

Changes made to the default values for Operations

The light auto percentage changed from 52.5 to 57.53.  
The light truck < 3750 lbs percentage changed from 15.9 to 17.42.  
The light truck 3751-5750 percentage changed from 16.7 to 18.30.  
The med truck 5751-8500 percentage changed from 7.6 to 1.40.  
The lite-heavy truck 8501-10000 percentage changed from 1.0 to 0.18.  
The lite-heavy truck 10001-14000 percentage changed from 0.3 to 0.06.  
The med-heavy truck 14001-33000 percentage changed from 0.9 to 0.17.  
The heavy-heavy truck 33001-60000 percentage changed from 0.7 to 0.13.  
The urban bus percentage changed from 0.2 to 0.22.  
The motorcycle percentage changed from 1.5 to 1.64.  
The school bus percentage changed from 0.1 to 0.11.  
The motorhome percentage changed from 2.6 to 2.84.  
The operational emission year changed from 2004 to 2030.  
The operational winter selection item changed from 3 to 2.  
The operational summer temperature changed from 90 to 75.  
The operational summer selection item changed from 8 to 5.  
The travel mode environment settings changed from both to: none

URBEMIS 2002 For Windows 7.5.0

File Name: P:\Projects - All Users\10800-00+\10953-00 Lake Forest Opportunities Study EIR\EIR\A  
Project Name: City of Lake Forest EIR - Existing General Plan Operational Emissions (Site 2)  
Project Location: South Coast Air Basin (Los Angeles area)  
On-Road Motor Vehicle Emissions Based on EMFAC2002 version 2.2

DETAIL REPORT  
(Pounds/Day - Summer)

AREA SOURCE EMISSION ESTIMATES (Summer Pounds per Day, Unmitigated)					
Source	ROG	NOx	CO	SO2	PM10
Natural Gas	1.45	19.94	7.98	-	0.04
Wood Stoves - No summer emissions					
Fireplaces - No summer emissions					
Landscaping	0.16	0.01	1.17	0.00	0.00
Consumer Prdcts	0.00	-	-	-	-
TOTALS (lbs/day, unmitigated)	1.61	19.96	9.15	0.00	0.04

UNMITIGATED OPERATIONAL EMISSIONS

	ROG	NOx	CO	SO2	PM10
Free-standing discount st	65.81	75.64	762.51	2.31	441.76
Office park	47.52	48.94	518.07	1.57	298.21
TOTAL EMISSIONS (lbs/day)	113.33	124.59	1,280.58	3.88	739.97

Does not include correction for passby trips.  
 Does not include double counting adjustment for internal trips.

OPERATIONAL (Vehicle) EMISSION ESTIMATES

Analysis Year: 2030 Temperature (F): 75 Season: Summer

EMFAC Version: EMFAC2002 (9/2002)

Summary of Land Uses:

Unit Type	Trip Rate	Size	Total Trips
Free-standing discount st	127.43 trips / 1000 sq. ft.	411.27	52,408.14
Office park	10.59 trips / 1000 sq. ft.	2,395.20	25,365.17

Vehicle Assumptions:

Fleet Mix:

Vehicle Type	Percent Type	Non-Catalyst	Catalyst	Diesel
Light Auto	57.53	0.00	100.00	0.00
Light Truck < 3,750 lbs	17.42	0.00	100.00	0.00
Light Truck 3,751- 5,750	18.30	0.00	100.00	0.00
Med Truck 5,751- 8,500	1.40	0.00	100.00	0.00
Lite-Heavy 8,501-10,000	0.18	0.00	80.00	20.00
Lite-Heavy 10,001-14,000	0.06	0.00	66.70	33.30
Med-Heavy 14,001-33,000	0.17	0.00	22.20	77.80
Heavy-Heavy 33,001-60,000	0.13	0.00	0.00	100.00
Line Haul > 60,000 lbs	0.00	0.00	0.00	100.00
Urban Bus	0.22	0.00	50.00	50.00
Motorcycle	1.64	33.30	66.70	0.00
School Bus	0.11	0.00	0.00	100.00
Motor Home	2.84	0.00	92.30	7.70

Travel Conditions

	Residential			Commercial		
	Home-Work	Home-Shop	Home-Other	Commute	Non-Work	Customer
Urban Trip Length (miles)	11.5	4.9	6.0	10.3	5.5	5.5
Rural Trip Length (miles)	11.5	4.9	6.0	10.3	5.5	5.5
Trip Speeds (mph)	35.0	40.0	40.0	40.0	40.0	40.0
% of Trips - Residential	20.0	37.0	43.0			

% of Trips - Commercial (by land use)

Free-standing discount store	2.0	1.0	97.0
Office park	48.0	24.0	28.0

Changes made to the default values for Land Use Trip Percentages

Changes made to the default values for Area

The wood stove option switch changed from on to off.  
The fireplcase option switch changed from on to off.  
The consumer products option switch changed from on to off.

Changes made to the default values for Operations

The light auto percentage changed from 52.5 to 57.53.  
The light truck < 3750 lbs percentage changed from 15.9 to 17.42.  
The light truck 3751-5750 percentage changed from 16.7 to 18.30.  
The med truck 5751-8500 percentage changed from 7.6 to 1.40.  
The lite-heavy truck 8501-10000 percentage changed from 1.0 to 0.18.  
The lite-heavy truck 10001-14000 percentage changed from 0.3 to 0.06.  
The med-heavy truck 14001-33000 percentage changed from 0.9 to 0.17.  
The heavy-heavy truck 33001-60000 percentage changed from 0.7 to 0.13.  
The urban bus percentage changed from 0.2 to 0.22.  
The motorcycle percentage changed from 1.5 to 1.64.  
The school bus percentage changed from 0.1 to 0.11.  
The motorhome percentage changed from 2.6 to 2.84.  
The operational emission year changed from 2004 to 2030.  
The operational winter selection item changed from 3 to 2.  
The operational summer temperature changed from 90 to 75.  
The operational summer selection item changed from 8 to 5.  
The travel mode environment settings changed from both to: none

URBEMIS 2002 For Windows 7.5.0

File Name: P:\Projects - All Users\10800-00+\10953-00 Lake Forest Opportunities Study EIR\EIR\A  
Project Name: City of Lake Forest EIR - Existing General Plan Operational Emissions (Site 2)  
Project Location: South Coast Air Basin (Los Angeles area)  
On-Road Motor Vehicle Emissions Based on EMFAC2002 version 2.2

DETAIL REPORT  
(Tons/Year)

AREA SOURCE EMISSION ESTIMATES

Source	ROG	NOx	CO	SO2	PM10
Natural Gas	0.26	3.64	1.46	-	0.01
Wood Stoves	0.00	0.00	0.00	0.00	0.00
Fireplaces	0.00	0.00	0.00	0.00	0.00
Landscaping	0.01	0.00	0.11	0.00	0.00
Consumer Prdcts	0.00	-	-	-	-
TOTALS (tpy, unmitigated)	0.28	3.64	1.56	0.00	0.01

UNMITIGATED OPERATIONAL EMISSIONS

	ROG	NOx	CO	SO2	PM10
Free-standing discount st	12.75	15.15	145.32	0.41	80.62
Office park	8.88	9.82	97.19	0.28	54.42
TOTAL EMISSIONS (tons/yr)	21.63	24.98	242.51	0.68	135.04

Does not include correction for passby trips.  
 Does not include double counting adjustment for internal trips.

OPERATIONAL (Vehicle) EMISSION ESTIMATES

Analysis Year: 2030 Temperature (F): 75 Season: Annual

EMFAC Version: EMFAC2002 (9/2002)

Summary of Land Uses:

Unit Type	Trip Rate	Size	Total Trips
Free-standing discount st	127.43 trips / 1000 sq. ft.	411.27	52,408.14
Office park	10.59 trips / 1000 sq. ft.	2,395.20	25,365.17

Vehicle Assumptions:

Fleet Mix:

Vehicle Type	Percent Type	Non-Catalyst	Catalyst	Diesel
Light Auto	57.53	0.00	100.00	0.00
Light Truck < 3,750 lbs	17.42	0.00	100.00	0.00
Light Truck 3,751- 5,750	18.30	0.00	100.00	0.00
Med Truck 5,751- 8,500	1.40	0.00	100.00	0.00
Lite-Heavy 8,501-10,000	0.18	0.00	80.00	20.00
Lite-Heavy 10,001-14,000	0.06	0.00	66.70	33.30
Med-Heavy 14,001-33,000	0.17	0.00	22.20	77.80
Heavy-Heavy 33,001-60,000	0.13	0.00	0.00	100.00
Line Haul > 60,000 lbs	0.00	0.00	0.00	100.00
Urban Bus	0.22	0.00	50.00	50.00
Motorcycle	1.64	33.30	66.70	0.00
School Bus	0.11	0.00	0.00	100.00
Motor Home	2.84	0.00	92.30	7.70

Travel Conditions

	Residential			Commercial		
	Home-Work	Home-Shop	Home-Other	Commute	Non-Work	Customer
Urban Trip Length (miles)	11.5	4.9	6.0	10.3	5.5	5.5
Rural Trip Length (miles)	11.5	4.9	6.0	10.3	5.5	5.5
Trip Speeds (mph)	35.0	40.0	40.0	40.0	40.0	40.0
% of Trips - Residential	20.0	37.0	43.0			

% of Trips - Commercial (by land use)

Free-standing discount store	2.0	1.0	97.0
Office park	48.0	24.0	28.0

Changes made to the default values for Land Use Trip Percentages

Changes made to the default values for Area

The wood stove option switch changed from on to off.  
The fireplace option switch changed from on to off.  
The consumer products option switch changed from on to off.

Changes made to the default values for Operations

The light auto percentage changed from 52.5 to 57.53.  
The light truck < 3750 lbs percentage changed from 15.9 to 17.42.  
The light truck 3751-5750 percentage changed from 16.7 to 18.30.  
The med truck 5751-8500 percentage changed from 7.6 to 1.40.  
The lite-heavy truck 8501-10000 percentage changed from 1.0 to 0.18.  
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The med-heavy truck 14001-33000 percentage changed from 0.9 to 0.17.  
The heavy-heavy truck 33001-60000 percentage changed from 0.7 to 0.13.  
The urban bus percentage changed from 0.2 to 0.22.  
The motorcycle percentage changed from 1.5 to 1.64.  
The school bus percentage changed from 0.1 to 0.11.  
The motorhome percentage changed from 2.6 to 2.84.  
The operational emission year changed from 2004 to 2030.  
The operational winter selection item changed from 3 to 2.  
The operational summer temperature changed from 90 to 75.  
The operational summer selection item changed from 8 to 5.  
The travel mode environment settings changed from both to: none

**EXPLANATION OF CHANGES MADE TO DEFAULT SETTINGS IN URBEMIS 2002**

**Project Number:** 10953-00

**Project Name:** City of Lake Forest Opportunities Study Program EIR - Existing General Plan (Site 2)

The following pages include the printed results of the air pollutant emissions modeling for one of the land use components of the proposed project. The air emissions modeling was conducted using the URBEMIS 2002 for Windows computer program developed for the Yolo-Solano Air Quality Management District in May 2003. URBEMIS 2002 is programmed with EMFAC 2002 emission factors developed by the California Air Resources Board.

As part of this analysis, changes have been made to several of the default values programmed into URBEMIS 2002. These changes were made to more accurately reflect the nature of the proposed land use. Each of these changes are discussed below.

**Vehicle Trip Rates**

The default vehicle trip rate values were changed to be consistent with the traffic impact analysis prepared for the project.

**Vehicle Fleet Mix**

URBEMIS 2002 is programmed with the following state-wide average vehicle fleet mix:

State-Wide Vehicle Type	Total	
Automobiles	52.5%	
Light-Duty Trucks <3,750 pounds	15.9%	
Light-Duty Trucks 3,751-5,750 pounds	16.7%	
Medium-Duty Trucks 5,751-8,500 pounds	7.6%	} 10.50% Total Trucks
Light-Heavy-Duty Trucks 8,501-10,000 pounds	1.0%	
Light-Heavy-Duty Trucks 10,001-14,000 pounds	0.3%	
Medium-Heavy-Duty Trucks 14,001-33,000 pounds	0.9%	
Heavy-Heavy-Duty Trucks 33,001-60,000 pounds	0.7%	
Line-Haul Vehicles	0.0%	
Urban Buses	0.2%	
Motorcycles	1.5%	
School Buses	0.1%	
Motor Homes	2.6%	

However, this state-wide average fleet mix is not appropriate for the majority of land use analyses. The project land use assessed in this analysis is identified below along with the total percentage of trucks (medium and heavy) that are expected for this land use. The following vehicle mix was calculated based on the percentage of trucks associated with this land use. The percentage of trucks for each land use were determined from the 3rd, 4th, 5th, and 6th Editions of the ITE Trip Generation manual.

ITE Code	Project Land Use:	Truck %	ADT	Truck #
210	Single Family	0.44%	0	0
230	Residential Condo	0.88%	0	0
220	Apartment	0.88%	0	0
150	Warehousing	27.00%	0	0
760	Research Center	1.84%	0	0
410	Park	0.44%	0	0
170	Utilities	30.00%	0	0
770	Business Park	1.84%	30,562	562
151	Mini Warehouse	7.00%	0	0
110	General Light Industry	8.00%	0	0
815	Discount Store	2.10%	17,026	358
0			0	0
Project Totals:			47,588	920
Project Truck %:			1.93%	

Vehicle Type	Total	
Automobiles	57.53%	
Light-Duty Trucks <3,750 pounds	17.42%	
Light-Duty Trucks 3,751-5,750 pounds	18.30%	
Medium-Duty Trucks 5,751-8,500 pounds	1.40%	} 1.93% Total Trucks
Light-Heavy-Duty Trucks 8,501-10,000 pounds	0.18%	
Light-Heavy-Duty Trucks 10,001-14,000 pounds	0.06%	
Medium-Heavy-Duty Trucks 14,001-33,000 pounds	0.17%	
Heavy-Heavy-Duty Trucks 33,001-60,000 pounds	0.13%	
Line-Haul Vehicles	0.00%	
Urban Buses	0.22%	
Motorcycles	1.64%	
School Buses	0.11%	
Motor Homes	2.85%	

URBEMIS 2002 For Windows 7.5.0

File Name: P:\Projects - All Users\10800-00+\10953-00 Lake Forest Opportunities Study EIR\EIR\A  
Project Name: City of Lake Forest EIR - Existing General Plan Operational Emissions (Site 3)  
Project Location: South Coast Air Basin (Los Angeles area)  
On-Road Motor Vehicle Emissions Based on EMFAC2002 version 2.2

SUMMARY REPORT  
(Pounds/Day - Summer)

AREA SOURCE EMISSION ESTIMATES

	ROG	NOx	CO	SO2	PM10
TOTALS (lbs/day,unmitigated)	0.51	3.66	3.21	0.00	0.01

OPERATIONAL (VEHICLE) EMISSION ESTIMATES

	ROG	NOx	CO	SO2	PM10
TOTALS (lbs/day,unmitigated)	24.61	25.77	250.88	0.79	142.66

SUM OF AREA AND OPERATIONAL EMISSION ESTIMATES

	ROG	NOx	CO	SO2	PM10
TOTALS (lbs/day,unmitigated)	25.12	29.43	254.09	0.79	142.67

URBEMIS 2002 For Windows 7.5.0

File Name: P:\Projects - All Users\10800-00+\10953-00 Lake Forest Opportunities Study EIR\EIR\A  
Project Name: City of Lake Forest EIR - Existing General Plan Operational Emissions (Site 3)  
Project Location: South Coast Air Basin (Los Angeles area)  
On-Road Motor Vehicle Emissions Based on EMFAC2002 version 2.2

SUMMARY REPORT  
(Pounds/Day - Winter)

AREA SOURCE EMISSION ESTIMATES

	ROG	NOx	CO	SO2	PM10
TOTALS (lbs/day,unmitigated)	0.26	3.64	1.46	0.00	0.01

OPERATIONAL (VEHICLE) EMISSION ESTIMATES

	ROG	NOx	CO	SO2	PM10
TOTALS (lbs/day,unmitigated)	25.02	33.13	271.65	0.72	142.66

SUM OF AREA AND OPERATIONAL EMISSION ESTIMATES

	ROG	NOx	CO	SO2	PM10
TOTALS (lbs/day,unmitigated)	25.28	36.77	273.11	0.72	142.67

URBEMIS 2002 For Windows 7.5.0

File Name: P:\Projects - All Users\10800-00+\10953-00 Lake Forest Opportunities Study EIR\EIR\A  
Project Name: City of Lake Forest EIR - Existing General Plan Operational Emissions (Site 3)  
Project Location: South Coast Air Basin (Los Angeles area)  
On-Road Motor Vehicle Emissions Based on EMFAC2002 version 2.2

SUMMARY REPORT  
(Tons/Year)

AREA SOURCE EMISSION ESTIMATES

	ROG	NOx	CO	SO2	PM10
TOTALS (tpy, unmitigated)	0.07	0.67	0.42	0.00	0.00

OPERATIONAL (VEHICLE) EMISSION ESTIMATES

	ROG	NOx	CO	SO2	PM10
TOTALS (tpy, unmitigated)	4.52	5.15	47.05	0.14	26.04

SUM OF AREA AND OPERATIONAL EMISSION ESTIMATES

	ROG	NOx	CO	SO2	PM10
TOTALS (tpy, unmitigated)	4.59	5.82	47.47	0.14	26.04

URBEMIS 2002 For Windows 7.5.0

File Name: P:\Projects - All Users\10800-00+\10953-00 Lake Forest Opportunities Study EIR\EIR\A  
Project Name: City of Lake Forest EIR - Existing General Plan Operational Emissions (Site 3)  
Project Location: South Coast Air Basin (Los Angeles area)  
On-Road Motor Vehicle Emissions Based on EMFAC2002 version 2.2

DETAIL REPORT  
(Pounds/Day - Winter)

AREA SOURCE EMISSION ESTIMATES (Winter Pounds per Day, Unmitigated)						
Source	ROG	NOx	CO	SO2	PM10	
Natural Gas	0.26	3.64	1.46	-	0.01	
Wood Stoves	0.00	0.00	0.00	0.00	0.00	
Fireplaces	0.00	0.00	0.00	0.00	0.00	
Landscaping - No winter emissions						
Consumer Prdcts	0.00	-	-	-	-	
TOTALS (lbs/day, unmitigated)	0.26	3.64	1.46	0.00	0.01	

UNMITIGATED OPERATIONAL EMISSIONS

	ROG	NOx	CO	SO2	PM10
Office park	7.31	9.79	80.26	0.21	42.22
General light industry	6.25	8.29	67.96	0.18	35.79
Industrial park	11.46	15.05	123.43	0.33	64.66
TOTAL EMISSIONS (lbs/day)	25.02	33.13	271.65	0.72	142.66

Does not include correction for passby trips.  
 Does not include double counting adjustment for internal trips.

OPERATIONAL (Vehicle) EMISSION ESTIMATES

Analysis Year: 2030 Temperature (F): 50 Season: Winter

EMFAC Version: EMFAC2002 (9/2002)

Summary of Land Uses:

Unit Type	Trip Rate	Size	Total Trips
Office park	11.76 trips / 1000 sq. ft.	304.92	3,585.86
General light industry	7.22 trips / 1000 sq. ft.	415.91	3,002.87
Industrial park	5.71 trips / 1000 sq. ft.	1,001.88	5,720.73

Vehicle Assumptions:

Fleet Mix:

Vehicle Type	Percent Type	Non-Catalyst	Catalyst	Diesel
Light Auto	54.23	0.00	100.00	0.00
Light Truck < 3,750 lbs	16.42	0.00	100.00	0.00
Light Truck 3,751- 5,750	17.25	0.00	100.00	0.00
Med Truck 5,751- 8,500	5.46	0.00	100.00	0.00
Lite-Heavy 8,501-10,000	0.70	0.00	80.00	20.00
Lite-Heavy 10,001-14,000	0.23	0.00	66.70	33.30
Med-Heavy 14,001-33,000	0.66	0.00	22.20	77.80
Heavy-Heavy 33,001-60,000	0.51	0.00	0.00	100.00
Line Haul > 60,000 lbs	0.00	0.00	0.00	100.00
Urban Bus	0.21	0.00	50.00	50.00
Motorcycle	1.55	33.30	66.70	0.00
School Bus	0.10	0.00	0.00	100.00
Motor Home	2.68	0.00	92.30	7.70

Travel Conditions

	Residential			Commercial		
	Home-Work	Home-Shop	Home-Other	Commuter	Non-Work	Customer
Urban Trip Length (miles)	11.5	4.9	6.0	10.3	5.5	5.5
Rural Trip Length (miles)	11.5	4.9	6.0	10.3	5.5	5.5
Trip Speeds (mph)	35.0	40.0	40.0	40.0	40.0	40.0
% of Trips - Residential	20.0	37.0	43.0			

% of Trips - Commercial (by land use)

Office park	48.0	24.0	28.0
General light industry	50.0	25.0	25.0
Industrial park	41.5	20.8	37.8

Changes made to the default values for Land Use Trip Percentages

Changes made to the default values for Area

The wood stove option switch changed from on to off.  
The fireplace option switch changed from on to off.  
The consumer products option switch changed from on to off.

Changes made to the default values for Operations

The light auto percentage changed from 52.5 to 54.23.  
The light truck < 3750 lbs percentage changed from 15.9 to 16.42.  
The light truck 3751-5750 percentage changed from 16.7 to 17.25.  
The med truck 5751-8500 percentage changed from 7.6 to 5.46.  
The lite-heavy truck 8501-10000 percentage changed from 1.0 to 0.70.  
The lite-heavy truck 10001-14000 percentage changed from 0.3 to 0.23.  
The med-heavy truck 14001-33000 percentage changed from 0.9 to 0.66.  
The heavy-heavy truck 33001-60000 percentage changed from 0.7 to 0.51.  
The urban bus percentage changed from 0.2 to 0.21.  
The motorcycle percentage changed from 1.5 to 1.55.  
The motorhome percentage changed from 2.6 to 2.68.  
The operational emission year changed from 2004 to 2030.  
The operational winter selection item changed from 3 to 2.  
The operational summer temperature changed from 90 to 75.  
The operational summer selection item changed from 8 to 5.  
The travel mode environment settings changed from both to: none

URBEMIS 2002 For Windows 7.5.0

File Name: P:\Projects - All Users\10800-00+\10953-00 Lake Forest Opportunities Study EIR\EIR\A  
Project Name: City of Lake Forest EIR - Existing General Plan Operational Emissions (Site 3)  
Project Location: South Coast Air Basin (Los Angeles area)  
On-Road Motor Vehicle Emissions Based on EMFAC2002 version 2.2

DETAIL REPORT  
(Pounds/Day - Summer)

AREA SOURCE EMISSION ESTIMATES (Summer Pounds per Day, Unmitigated)					
Source	ROG	NOx	CO	SO2	PM10
Natural Gas	0.26	3.64	1.46	-	0.01
Wood Stoves - No summer emissions					
Fireplaces - No summer emissions					
Landscaping	0.25	0.02	1.75	0.00	0.01
Consumer Prdcts	0.00	-	-	-	-
TOTALS (lbs/day, unmitigated)	0.51	3.66	3.21	0.00	0.01

UNMITIGATED OPERATIONAL EMISSIONS

	ROG	NOx	CO	SO2	PM10
Office park	6.75	7.61	74.26	0.23	42.22
General light industry	6.11	6.45	62.97	0.20	35.79
Industrial park	11.74	11.71	113.65	0.36	64.66
TOTAL EMISSIONS (lbs/day)	24.61	25.77	250.88	0.79	142.66

Does not include correction for passby trips.  
 Does not include double counting adjustment for internal trips.

OPERATIONAL (Vehicle) EMISSION ESTIMATES

Analysis Year: 2030 Temperature (F): 75 Season: Summer

EMFAC Version: EMFAC2002 (9/2002)

Summary of Land Uses:

Unit Type	Trip Rate	Size	Total Trips
Office park	11.76 trips / 1000 sq. ft.	304.92	3,585.86
General light industry	7.22 trips / 1000 sq. ft.	415.91	3,002.87
Industrial park	5.71 trips / 1000 sq. ft.	1,001.88	5,720.73

Vehicle Assumptions:

Fleet Mix:

Vehicle Type	Percent Type	Non-Catalyst	Catalyst	Diesel
Light Auto	54.23	0.00	100.00	0.00
Light Truck < 3,750 lbs	16.42	0.00	100.00	0.00
Light Truck 3,751- 5,750	17.25	0.00	100.00	0.00
Med Truck 5,751- 8,500	5.46	0.00	100.00	0.00
Lite-Heavy 8,501-10,000	0.70	0.00	80.00	20.00
Lite-Heavy 10,001-14,000	0.23	0.00	66.70	33.30
Med-Heavy 14,001-33,000	0.66	0.00	22.20	77.80
Heavy-Heavy 33,001-60,000	0.51	0.00	0.00	100.00
Line Haul > 60,000 lbs	0.00	0.00	0.00	100.00
Urban Bus	0.21	0.00	50.00	50.00
Motorcycle	1.55	33.30	66.70	0.00
School Bus	0.10	0.00	0.00	100.00
Motor Home	2.68	0.00	92.30	7.70

Travel Conditions

	Residential			Commercial		
	Home-Work	Home-Shop	Home-Other	Commute	Non-Work	Customer
Urban Trip Length (miles)	11.5	4.9	6.0	10.3	5.5	5.5
Rural Trip Length (miles)	11.5	4.9	6.0	10.3	5.5	5.5
Trip Speeds (mph)	35.0	40.0	40.0	40.0	40.0	40.0
% of Trips - Residential	20.0	37.0	43.0			

% of Trips - Commercial (by land use)

Office park	48.0	24.0	28.0
General light industry	50.0	25.0	25.0
Industrial park	41.5	20.8	37.8

Changes made to the default values for Land Use Trip Percentages

Changes made to the default values for Area

The wood stove option switch changed from on to off.  
The fireplace option switch changed from on to off.  
The consumer products option switch changed from on to off.

Changes made to the default values for Operations

The light auto percentage changed from 52.5 to 54.23.  
The light truck < 3750 lbs percentage changed from 15.9 to 16.42.  
The light truck 3751-5750 percentage changed from 16.7 to 17.25.  
The med truck 5751-8500 percentage changed from 7.6 to 5.46.  
The lite-heavy truck 8501-10000 percentage changed from 1.0 to 0.70.  
The lite-heavy truck 10001-14000 percentage changed from 0.3 to 0.23.  
The med-heavy truck 14001-33000 percentage changed from 0.9 to 0.66.  
The heavy-heavy truck 33001-60000 percentage changed from 0.7 to 0.51.  
The urban bus percentage changed from 0.2 to 0.21.  
The motorcycle percentage changed from 1.5 to 1.55.  
The motorhome percentage changed from 2.6 to 2.68.  
The operational emission year changed from 2004 to 2030.  
The operational winter selection item changed from 3 to 2.  
The operational summer temperature changed from 90 to 75.  
The operational summer selection item changed from 8 to 5.  
The travel mode environment settings changed from both to: none

URBEMIS 2002 For Windows 7.5.0

File Name: P:\Projects - All Users\10800-00+\10953-00 Lake Forest Opportunities Study EIR\EIR\A  
Project Name: City of Lake Forest EIR - Existing General Plan Operational Emissions (Site 3)  
Project Location: South Coast Air Basin (Los Angeles area)  
On-Road Motor Vehicle Emissions Based on EMFAC2002 version 2.2

DETAIL REPORT  
(Tons/Year)

AREA SOURCE EMISSION ESTIMATES

Source	ROG	NOx	CO	SO2	PM10
Natural Gas	0.05	0.66	0.27	-	0.00
Wood Stoves	0.00	0.00	0.00	0.00	0.00
Fireplaces	0.00	0.00	0.00	0.00	0.00
Landscaping	0.02	0.00	0.16	0.00	0.00
Consumer Prdcts	0.00	-	-	-	-
TOTALS (tpy, unmitigated)	0.07	0.67	0.42	0.00	0.00

UNMITIGATED OPERATIONAL EMISSIONS

	ROG	NOx	CO	SO2	PM10
Office park	1.27	1.52	13.92	0.04	7.70
General light industry	1.12	1.29	11.80	0.04	6.53
Industrial park	2.13	2.34	21.34	0.06	11.80
TOTAL EMISSIONS (tons/yr)	4.52	5.15	47.05	0.14	26.04

Does not include correction for passby trips.  
 Does not include double counting adjustment for internal trips.

OPERATIONAL (Vehicle) EMISSION ESTIMATES

Analysis Year: 2030 Temperature (F): 75 Season: Annual

EMFAC Version: EMFAC2002 (9/2002)

Summary of Land Uses:

Unit Type	Trip Rate	Size	Total Trips
Office park	11.76 trips / 1000 sq. ft.	304.92	3,585.86
General light industry	7.22 trips / 1000 sq. ft.	415.91	3,002.87
Industrial park	5.71 trips / 1000 sq. ft.	1,001.88	5,720.73

Vehicle Assumptions:

Fleet Mix:

Vehicle Type	Percent Type	Non-Catalyst	Catalyst	Diesel
Light Auto	54.23	0.00	100.00	0.00
Light Truck < 3,750 lbs	16.42	0.00	100.00	0.00
Light Truck 3,751- 5,750	17.25	0.00	100.00	0.00
Med Truck 5,751- 8,500	5.46	0.00	100.00	0.00
Lite-Heavy 8,501-10,000	0.70	0.00	80.00	20.00
Lite-Heavy 10,001-14,000	0.23	0.00	66.70	33.30
Med-Heavy 14,001-33,000	0.66	0.00	22.20	77.80
Heavy-Heavy 33,001-60,000	0.51	0.00	0.00	100.00
Line Haul > 60,000 lbs	0.00	0.00	0.00	100.00
Urban Bus	0.21	0.00	50.00	50.00
Motorcycle	1.55	33.30	66.70	0.00
School Bus	0.10	0.00	0.00	100.00
Motor Home	2.68	0.00	92.30	7.70

Travel Conditions

	Residential			Commercial		
	Home-Work	Home-Shop	Home-Other	Commute	Non-Work	Customer
Urban Trip Length (miles)	11.5	4.9	6.0	10.3	5.5	5.5
Rural Trip Length (miles)	11.5	4.9	6.0	10.3	5.5	5.5
Trip Speeds (mph)	35.0	40.0	40.0	40.0	40.0	40.0
% of Trips - Residential	20.0	37.0	43.0			

% of Trips - Commercial (by land use)

Office park	48.0	24.0	28.0
General light industry	50.0	25.0	25.0
Industrial park	41.5	20.8	37.8

Changes made to the default values for Land Use Trip Percentages

Changes made to the default values for Area

The wood stove option switch changed from on to off.  
The fireplace option switch changed from on to off.  
The consumer products option switch changed from on to off.

Changes made to the default values for Operations

The light auto percentage changed from 52.5 to 54.23.  
The light truck < 3750 lbs percentage changed from 15.9 to 16.42.  
The light truck 3751-5750 percentage changed from 16.7 to 17.25.  
The med truck 5751-8500 percentage changed from 7.6 to 5.46.  
The lite-heavy truck 8501-10000 percentage changed from 1.0 to 0.70.  
The lite-heavy truck 10001-14000 percentage changed from 0.3 to 0.23.  
The med-heavy truck 14001-33000 percentage changed from 0.9 to 0.66.  
The heavy-heavy truck 33001-60000 percentage changed from 0.7 to 0.51.  
The urban bus percentage changed from 0.2 to 0.21.  
The motorcycle percentage changed from 1.5 to 1.55.  
The motorhome percentage changed from 2.6 to 2.68.  
The operational emission year changed from 2004 to 2030.  
The operational winter selection item changed from 3 to 2.  
The operational summer temperature changed from 90 to 75.  
The operational summer selection item changed from 8 to 5.  
The travel mode environment settings changed from both to: none

**EXPLANATION OF CHANGES MADE TO DEFAULT SETTINGS IN URBEMIS 2002**

**Project Number:** 10953-00

**Project Name:** City of Lake Forest Opportunities Study Program EIR - Existing General Plan (Site 3)

The following pages include the printed results of the air pollutant emissions modeling for one of the land use components of the proposed project. The air emissions modeling was conducted using the URBEMIS 2002 for Windows computer program developed for the Yolo-Solano Air Quality Management District in May 2003. URBEMIS 2002 is programmed with EMFAC 2002 emission factors developed by the California Air Resources Board.

As part of this analysis, changes have been made to several of the default values programmed into URBEMIS 2002. These changes were made to more accurately reflect the nature of the proposed land use. Each of these changes are discussed below.

**Vehicle Trip Rates**

The default vehicle trip rate values were changed to be consistent with the traffic impact analysis prepared for the project.

**Vehicle Fleet Mix**

URBEMIS 2002 is programmed with the following state-wide average vehicle fleet mix:

State-Wide Vehicle Type	Total	
Automobiles	57.5%	
Light-Duty Trucks <3,750 pounds	17.4%	
Light-Duty Trucks 3,751-5,750 pounds	18.3%	
Medium-Duty Trucks 5,751-8,500 pounds	1.4%	} 1.94% Total Trucks
Light-Heavy-Duty Trucks 8,501-10,000 pounds	0.2%	
Light-Heavy-Duty Trucks 10,001-14,000 pounds	0.1%	
Medium-Heavy-Duty Trucks 14,001-33,000 pounds	0.2%	
Heavy-Heavy-Duty Trucks 33,001-60,000 pounds	0.1%	
Line-Haul Vehicles	0.0%	
Urban Buses	0.2%	
Motorcycles	1.6%	
School Buses	0.1%	
Motor Homes	2.8%	

However, this state-wide average fleet mix is not appropriate for the majority of land use analyses. The project land use assessed in this analysis is identified below along with the total percentage of trucks (medium and heavy) that are expected for this land use. The following vehicle mix was calculated based on the percentage of trucks associated with this land use. The percentage of trucks for each land use were determined from the 3rd, 4th, 5th, and 6th Editions of the ITE Trip Generation manual.

ITE Code	Project Land Use:	Truck %	ADT	Truck #
210	Single Family	0.44%	0	0
230	Residential Condo	0.88%	0	0
220	Apartment	0.88%	0	0
150	Warehousing	27.00%	0	0
760	Research Center	1.84%	0	0
410	Park	0.44%	0	0
170	Utilities	30.00%	573	172
770	Business Park	1.84%	3,891	72
151	Mini Warehouse	7.00%	0	0
110	General Light Industry	8.00%	21,544	1,724
815	Discount Store	2.10%	0	0
710	General Office	1.84%	0	0
Project Totals:			26,008	1,967
Project Truck %:			7.56%	

Vehicle Type	Total	
Automobiles	54.23%	
Light-Duty Trucks <3,750 pounds	16.42%	
Light-Duty Trucks 3,751-5,750 pounds	17.25%	
Medium-Duty Trucks 5,751-8,500 pounds	5.46%	} 7.56% Total Trucks
Light-Heavy-Duty Trucks 8,501-10,000 pounds	0.70%	
Light-Heavy-Duty Trucks 10,001-14,000 pounds	0.23%	
Medium-Heavy-Duty Trucks 14,001-33,000 pounds	0.66%	
Heavy-Heavy-Duty Trucks 33,001-60,000 pounds	0.51%	
Line-Haul Vehicles	0.00%	
Urban Buses	0.21%	
Motorcycles	1.55%	
School Buses	0.10%	
Motor Homes	2.68%	

URBEMIS 2002 For Windows 7.5.0

File Name: P:\Projects - All Users\10800-00+\10953-00 Lake Forest Opportunities Study EIR\EIR\A  
Project Name: City of Lake Forest EIR - Existing General Plan Operational Emissions (Site 4)  
Project Location: South Coast Air Basin (Los Angeles area)  
On-Road Motor Vehicle Emissions Based on EMFAC2002 version 2.2

SUMMARY REPORT  
(Pounds/Day - Summer)

AREA SOURCE EMISSION ESTIMATES

	ROG	NOx	CO	SO2	PM10
TOTALS (lbs/day,unmitigated)	0.44	4.96	2.57	0.00	0.01

OPERATIONAL (VEHICLE) EMISSION ESTIMATES

	ROG	NOx	CO	SO2	PM10
TOTALS (lbs/day,unmitigated)	94.76	109.35	1,099.69	3.33	636.60

SUM OF AREA AND OPERATIONAL EMISSION ESTIMATES

	ROG	NOx	CO	SO2	PM10
TOTALS (lbs/day,unmitigated)	95.20	114.31	1,102.26	3.33	636.61

URBEMIS 2002 For Windows 7.5.0

File Name: P:\Projects - All Users\10800-00+\10953-00 Lake Forest Opportunities Study EIR\EIR\A  
Project Name: City of Lake Forest EIR - Existing General Plan Operational Emissions (Site 4)  
Project Location: South Coast Air Basin (Los Angeles area)  
On-Road Motor Vehicle Emissions Based on EMFAC2002 version 2.2

SUMMARY REPORT  
(Pounds/Day - Winter)

AREA SOURCE EMISSION ESTIMATES

	ROG	NOx	CO	SO2	PM10
TOTALS (lbs/day,unmitigated)	0.36	4.96	1.98	0.00	0.01

OPERATIONAL (VEHICLE) EMISSION ESTIMATES

	ROG	NOx	CO	SO2	PM10
TOTALS (lbs/day,unmitigated)	112.51	141.38	1,245.86	3.00	636.60

SUM OF AREA AND OPERATIONAL EMISSION ESTIMATES

	ROG	NOx	CO	SO2	PM10
TOTALS (lbs/day,unmitigated)	112.87	146.34	1,247.85	3.00	636.61

URBEMIS 2002 For Windows 7.5.0

File Name: P:\Projects - All Users\10800-00+\10953-00 Lake Forest Opportunities Study EIR\EIR\A  
Project Name: City of Lake Forest EIR - Existing General Plan Operational Emissions (Site 4)  
Project Location: South Coast Air Basin (Los Angeles area)  
On-Road Motor Vehicle Emissions Based on EMFAC2002 version 2.2

SUMMARY REPORT  
(Tons/Year)

AREA SOURCE EMISSION ESTIMATES

	ROG	NOx	CO	SO2	PM10
TOTALS (tpy, unmitigated)	0.07	0.91	0.41	0.00	0.00

OPERATIONAL (VEHICLE) EMISSION ESTIMATES

	ROG	NOx	CO	SO2	PM10
TOTALS (tpy, unmitigated)	18.37	21.90	209.59	0.59	116.18

SUM OF AREA AND OPERATIONAL EMISSION ESTIMATES

	ROG	NOx	CO	SO2	PM10
TOTALS (tpy, unmitigated)	18.45	22.81	210.00	0.59	116.18

URBEMIS 2002 For Windows 7.5.0

File Name: P:\Projects - All Users\10800-00+\10953-00 Lake Forest Opportunities Study EIR\EIR\A  
Project Name: City of Lake Forest EIR - Existing General Plan Operational Emissions (Site 4)  
Project Location: South Coast Air Basin (Los Angeles area)  
On-Road Motor Vehicle Emissions Based on EMFAC2002 version 2.2

DETAIL REPORT  
(Pounds/Day - Winter)

AREA SOURCE EMISSION ESTIMATES (Winter Pounds per Day, Unmitigated)					
Source	ROG	NOx	CO	SO2	PM10
Natural Gas	0.36	4.96	1.98	-	0.01
Wood Stoves	0.00	0.00	0.00	0.00	0.00
Fireplaces	0.00	0.00	0.00	0.00	0.00
Landscaping - No winter emissions					
Consumer Prdcts	0.00	-	-	-	-
TOTALS (lbs/day, unmitigated)	0.36	4.96	1.98	0.00	0.01

UNMITIGATED OPERATIONAL EMISSIONS

	ROG	NOx	CO	SO2	PM10
Free-standing discount st	112.51	141.38	1,245.86	3.00	636.60
TOTAL EMISSIONS (lbs/day)	112.51	141.38	1,245.86	3.00	636.60

Does not include correction for passby trips.  
 Does not include double counting adjustment for internal trips.

OPERATIONAL (Vehicle) EMISSION ESTIMATES

Analysis Year: 2030 Temperature (F): 50 Season: Winter

EMFAC Version: EMFAC2002 (9/2002)

Summary of Land Uses:

Unit Type	Trip Rate	Size	Total Trips
Free-standing discount st	147.24 trips / 1000 sq. ft.	512.91	75,520.87

Vehicle Assumptions:

Fleet Mix:

Vehicle Type	Percent Type	Non-Catalyst	Catalyst	Diesel
Light Auto	57.43	0.00	100.00	0.00
Light Truck < 3,750 lbs	17.39	0.00	100.00	0.00
Light Truck 3,751- 5,750	18.27	0.00	100.00	0.00
Med Truck 5,751- 8,500	1.52	0.00	100.00	0.00
Lite-Heavy 8,501-10,000	0.20	0.00	80.00	20.00
Lite-Heavy 10,001-14,000	0.06	0.00	66.70	33.30
Med-Heavy 14,001-33,000	0.18	0.00	22.20	77.80
Heavy-Heavy 33,001-60,000	0.14	0.00	0.00	100.00
Line Haul > 60,000 lbs	0.00	0.00	0.00	100.00
Urban Bus	0.22	0.00	50.00	50.00
Motorcycle	1.64	33.30	66.70	0.00
School Bus	0.11	0.00	0.00	100.00
Motor Home	2.84	0.00	92.30	7.70

Travel Conditions

	Residential			Commercial		
	Home-Work	Home-Shop	Home-Other	Commute	Non-Work	Customer
Urban Trip Length (miles)	11.5	4.9	6.0	10.3	5.5	5.5
Rural Trip Length (miles)	11.5	4.9	6.0	10.3	5.5	5.5
Trip Speeds (mph)	35.0	40.0	40.0	40.0	40.0	40.0
% of Trips - Residential	20.0	37.0	43.0			

% of Trips - Commercial (by land use)

Free-standing discount store	2.0	1.0	97.0
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Changes made to the default values for Land Use Trip Percentages

Changes made to the default values for Area

The wood stove option switch changed from on to off.  
The fireplcase option switch changed from on to off.  
The consumer products option switch changed from on to off.

Changes made to the default values for Operations

The light auto percentage changed from 52.5 to 57.43.  
The light truck < 3750 lbs percentage changed from 15.9 to 17.39.  
The light truck 3751-5750 percentage changed from 16.7 to 18.27.  
The med truck 5751-8500 percentage changed from 7.6 to 1.52.  
The lite-heavy truck 8501-10000 percentage changed from 1.0 to 0.20.  
The lite-heavy truck 10001-14000 percentage changed from 0.3 to 0.06.  
The med-heavy truck 14001-33000 percentage changed from 0.9 to 0.18.  
The heavy-heavy truck 33001-60000 percentage changed from 0.7 to 0.14.  
The urban bus percentage changed from 0.2 to 0.22.  
The motorcycle percentage changed from 1.5 to 1.64.  
The school bus percentage changed from 0.1 to 0.11.  
The motorhome percentage changed from 2.6 to 2.84.  
The operational emission year changed from 2004 to 2030.  
The operational winter selection item changed from 3 to 2.  
The operational summer temperature changed from 90 to 75.  
The operational summer selection item changed from 8 to 5.  
The travel mode environment settings changed from both to: none

URBEMIS 2002 For Windows 7.5.0

File Name: P:\Projects - All Users\10800-00+\10953-00 Lake Forest Opportunities Study EIR\EIR\A  
Project Name: City of Lake Forest EIR - Existing General Plan Operational Emissions (Site 4)  
Project Location: South Coast Air Basin (Los Angeles area)  
On-Road Motor Vehicle Emissions Based on EMFAC2002 version 2.2

DETAIL REPORT  
(Pounds/Day - Summer)

AREA SOURCE EMISSION ESTIMATES (Summer Pounds per Day, Unmitigated)					
Source	ROG	NOx	CO	SO2	PM10
Natural Gas	0.36	4.96	1.98	-	0.01
Wood Stoves - No summer emissions					
Fireplaces - No summer emissions					
Landscaping	0.08	0.01	0.58	0.00	0.00
Consumer Prdcts	0.00	-	-	-	-
TOTALS (lbs/day, unmitigated)	0.44	4.96	2.57	0.00	0.01

UNMITIGATED OPERATIONAL EMISSIONS

	ROG	NOx	CO	SO2	PM10
Free-standing discount st	94.76	109.35	1,099.69	3.33	636.60
TOTAL EMISSIONS (lbs/day)	94.76	109.35	1,099.69	3.33	636.60

Does not include correction for passby trips.  
 Does not include double counting adjustment for internal trips.

OPERATIONAL (Vehicle) EMISSION ESTIMATES

Analysis Year: 2030 Temperature (F): 75 Season: Summer

EMFAC Version: EMFAC2002 (9/2002)

Summary of Land Uses:

Unit Type	Trip Rate	Size	Total Trips
Free-standing discount st	147.24 trips / 1000 sq. ft.	512.91	75,520.87

Vehicle Assumptions:

Fleet Mix:

Vehicle Type	Percent Type	Non-Catalyst	Catalyst	Diesel
Light Auto	57.43	0.00	100.00	0.00
Light Truck < 3,750 lbs	17.39	0.00	100.00	0.00
Light Truck 3,751- 5,750	18.27	0.00	100.00	0.00
Med Truck 5,751- 8,500	1.52	0.00	100.00	0.00
Lite-Heavy 8,501-10,000	0.20	0.00	80.00	20.00
Lite-Heavy 10,001-14,000	0.06	0.00	66.70	33.30
Med-Heavy 14,001-33,000	0.18	0.00	22.20	77.80
Heavy-Heavy 33,001-60,000	0.14	0.00	0.00	100.00
Line Haul > 60,000 lbs	0.00	0.00	0.00	100.00
Urban Bus	0.22	0.00	50.00	50.00
Motorcycle	1.64	33.30	66.70	0.00
School Bus	0.11	0.00	0.00	100.00
Motor Home	2.84	0.00	92.30	7.70

Travel Conditions

	Residential			Commercial		
	Home-Work	Home-Shop	Home-Other	Commute	Non-Work	Customer
Urban Trip Length (miles)	11.5	4.9	6.0	10.3	5.5	5.5
Rural Trip Length (miles)	11.5	4.9	6.0	10.3	5.5	5.5
Trip Speeds (mph)	35.0	40.0	40.0	40.0	40.0	40.0
% of Trips - Residential	20.0	37.0	43.0			

% of Trips - Commercial (by land use)

Free-standing discount store	2.0	1.0	97.0
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Changes made to the default values for Land Use Trip Percentages

Changes made to the default values for Area

The wood stove option switch changed from on to off.  
The fireplace option switch changed from on to off.  
The consumer products option switch changed from on to off.

Changes made to the default values for Operations

The light auto percentage changed from 52.5 to 57.43.  
The light truck < 3750 lbs percentage changed from 15.9 to 17.39.  
The light truck 3751-5750 percentage changed from 16.7 to 18.27.  
The med truck 5751-8500 percentage changed from 7.6 to 1.52.  
The lite-heavy truck 8501-10000 percentage changed from 1.0 to 0.20.  
The lite-heavy truck 10001-14000 percentage changed from 0.3 to 0.06.  
The med-heavy truck 14001-33000 percentage changed from 0.9 to 0.18.  
The heavy-heavy truck 33001-60000 percentage changed from 0.7 to 0.14.  
The urban bus percentage changed from 0.2 to 0.22.  
The motorcycle percentage changed from 1.5 to 1.64.  
The school bus percentage changed from 0.1 to 0.11.  
The motorhome percentage changed from 2.6 to 2.84.  
The operational emission year changed from 2004 to 2030.  
The operational winter selection item changed from 3 to 2.  
The operational summer temperature changed from 90 to 75.  
The operational summer selection item changed from 8 to 5.  
The travel mode environment settings changed from both to: none

URBEMIS 2002 For Windows 7.5.0

File Name: P:\Projects - All Users\10800-00+\10953-00 Lake Forest Opportunities Study EIR\EIR\A  
Project Name: City of Lake Forest EIR - Existing General Plan Operational Emissions (Site 4)  
Project Location: South Coast Air Basin (Los Angeles area)  
On-Road Motor Vehicle Emissions Based on EMFAC2002 version 2.2

DETAIL REPORT  
(Tons/Year)

AREA SOURCE EMISSION ESTIMATES

Source	ROG	NOx	CO	SO2	PM10
Natural Gas	0.07	0.90	0.36	-	0.00
Wood Stoves	0.00	0.00	0.00	0.00	0.00
Fireplaces	0.00	0.00	0.00	0.00	0.00
Landscaping	0.01	0.00	0.05	0.00	0.00
Consumer Prdcts	0.00	-	-	-	-
TOTALS (tpy, unmitigated)	0.07	0.91	0.41	0.00	0.00

UNMITIGATED OPERATIONAL EMISSIONS

	ROG	NOx	CO	SO2	PM10
Free-standing discount st	18.37	21.90	209.59	0.59	116.18
TOTAL EMISSIONS (tons/yr)	18.37	21.90	209.59	0.59	116.18

Does not include correction for passby trips.  
 Does not include double counting adjustment for internal trips.

OPERATIONAL (Vehicle) EMISSION ESTIMATES

Analysis Year: 2030 Temperature (F): 75 Season: Annual

EMFAC Version: EMFAC2002 (9/2002)

Summary of Land Uses:

Unit Type	Trip Rate	Size	Total Trips
Free-standing discount st	147.24 trips / 1000 sq. ft.	512.91	75,520.87

Vehicle Assumptions:

Fleet Mix:

Vehicle Type	Percent Type	Non-Catalyst	Catalyst	Diesel
Light Auto	57.43	0.00	100.00	0.00
Light Truck < 3,750 lbs	17.39	0.00	100.00	0.00
Light Truck 3,751- 5,750	18.27	0.00	100.00	0.00
Med Truck 5,751- 8,500	1.52	0.00	100.00	0.00
Lite-Heavy 8,501-10,000	0.20	0.00	80.00	20.00
Lite-Heavy 10,001-14,000	0.06	0.00	66.70	33.30
Med-Heavy 14,001-33,000	0.18	0.00	22.20	77.80
Heavy-Heavy 33,001-60,000	0.14	0.00	0.00	100.00
Line Haul > 60,000 lbs	0.00	0.00	0.00	100.00
Urban Bus	0.22	0.00	50.00	50.00
Motorcycle	1.64	33.30	66.70	0.00
School Bus	0.11	0.00	0.00	100.00
Motor Home	2.84	0.00	92.30	7.70

Travel Conditions

	Residential			Commercial		
	Home-Work	Home-Shop	Home-Other	Commute	Non-Work	Customer
Urban Trip Length (miles)	11.5	4.9	6.0	10.3	5.5	5.5
Rural Trip Length (miles)	11.5	4.9	6.0	10.3	5.5	5.5
Trip Speeds (mph)	35.0	40.0	40.0	40.0	40.0	40.0
% of Trips - Residential	20.0	37.0	43.0			

% of Trips - Commercial (by land use)

Free-standing discount store	2.0	1.0	97.0
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Changes made to the default values for Land Use Trip Percentages

Changes made to the default values for Area

The wood stove option switch changed from on to off.  
The fireplace option switch changed from on to off.  
The consumer products option switch changed from on to off.

Changes made to the default values for Operations

The light auto percentage changed from 52.5 to 57.43.  
The light truck < 3750 lbs percentage changed from 15.9 to 17.39.  
The light truck 3751-5750 percentage changed from 16.7 to 18.27.  
The med truck 5751-8500 percentage changed from 7.6 to 1.52.  
The lite-heavy truck 8501-10000 percentage changed from 1.0 to 0.20.  
The lite-heavy truck 10001-14000 percentage changed from 0.3 to 0.06.  
The med-heavy truck 14001-33000 percentage changed from 0.9 to 0.18.  
The heavy-heavy truck 33001-60000 percentage changed from 0.7 to 0.14.  
The urban bus percentage changed from 0.2 to 0.22.  
The motorcycle percentage changed from 1.5 to 1.64.  
The school bus percentage changed from 0.1 to 0.11.  
The motorhome percentage changed from 2.6 to 2.84.  
The operational emission year changed from 2004 to 2030.  
The operational winter selection item changed from 3 to 2.  
The operational summer temperature changed from 90 to 75.  
The operational summer selection item changed from 8 to 5.  
The travel mode environment settings changed from both to: none

**EXPLANATION OF CHANGES MADE TO DEFAULT SETTINGS IN URBEMIS 2002**

**Project Number:** 10953-00

**Project Name:** City of Lake Forest Opportunities Study Program EIR - Existing General Plan (Site 4)

The following pages include the printed results of the air pollutant emissions modeling for one of the land use components of the proposed project. The air emissions modeling was conducted using the URBEMIS 2002 for Windows computer program developed for the Yolo-Solano Air Quality Management District in May 2003. URBEMIS 2002 is programmed with EMFAC 2002 emission factors developed by the California Air Resources Board.

As part of this analysis, changes have been made to several of the default values programmed into URBEMIS 2002. These changes were made to more accurately reflect the nature of the proposed land use. Each of these changes are discussed below.

**Vehicle Trip Rates**

The default vehicle trip rate values were changed to be consistent with the traffic impact analysis prepared for the project.

**Vehicle Fleet Mix**

URBEMIS 2002 is programmed with the following state-wide average vehicle fleet mix:

State-Wide Vehicle Type	Total	
Automobiles	52.5%	
Light-Duty Trucks <3,750 pounds	15.9%	
Light-Duty Trucks 3,751-5,750 pounds	16.7%	
Medium-Duty Trucks 5,751-8,500 pounds	7.6%	} 10.50% Total Trucks
Light-Heavy-Duty Trucks 8,501-10,000 pounds	1.0%	
Light-Heavy-Duty Trucks 10,001-14,000 pounds	0.3%	
Medium-Heavy-Duty Trucks 14,001-33,000 pounds	0.9%	
Heavy-Heavy-Duty Trucks 33,001-60,000 pounds	0.7%	
Line-Haul Vehicles	0.0%	
Urban Buses	0.2%	
Motorcycles	1.5%	
School Buses	0.1%	
Motor Homes	2.6%	

However, this state-wide average fleet mix is not appropriate for the majority of land use analyses. The project land use assessed in this analysis is identified below along with the total percentage of trucks (medium and heavy) that are expected for this land use. The following vehicle mix was calculated based on the percentage of trucks associated with this land use. The percentage of trucks for each land use were determined from the 3rd, 4th, 5th, and 6th Editions of the ITE Trip Generation manual.

ITE Code	Project Land Use:	Truck %	ADT	Truck #
210	Single Family	0.44%	0	0
230	Residential Condo	0.88%	0	0
220	Apartment	0.88%	0	0
150	Warehousing	27.00%	0	0
760	Research Center	1.84%	0	0
410	Park	0.44%	0	0
170	Utilities	30.00%	0	0
770	Business Park	1.84%	0	0
151	Mini Warehouse	7.00%	0	0
110	General Light Industry	8.00%	0	0
815	Discount Store	2.10%	24,627	517
710	General Office	1.84%	0	0
Project Totals:			24,627	517
Project Truck %:			2.10%	

Vehicle Type	Total	
Automobiles	57.43%	
Light-Duty Trucks <3,750 pounds	17.39%	
Light-Duty Trucks 3,751-5,750 pounds	18.27%	
Medium-Duty Trucks 5,751-8,500 pounds	1.52%	} 2.10% Total Trucks
Light-Heavy-Duty Trucks 8,501-10,000 pounds	0.20%	
Light-Heavy-Duty Trucks 10,001-14,000 pounds	0.06%	
Medium-Heavy-Duty Trucks 14,001-33,000 pounds	0.18%	
Heavy-Heavy-Duty Trucks 33,001-60,000 pounds	0.14%	
Line-Haul Vehicles	0.00%	
Urban Buses	0.22%	
Motorcycles	1.64%	
School Buses	0.11%	
Motor Homes	2.84%	

URBEMIS 2002 For Windows 7.5.0

File Name: P:\Projects - All Users\10800-00+\10953-00 Lake Forest Opportunities Study EIR\EIR\A  
Project Name: City of Lake Forest EIR - Existing General Plan Operational Emissions (Site 5)  
Project Location: South Coast Air Basin (Los Angeles area)  
On-Road Motor Vehicle Emissions Based on EMFAC2002 version 2.2

SUMMARY REPORT  
(Pounds/Day - Summer)

AREA SOURCE EMISSION ESTIMATES

	ROG	NOx	CO	SO2	PM10
TOTALS (lbs/day,unmitigated)	0.17	1.25	1.08	0.00	0.00

OPERATIONAL (VEHICLE) EMISSION ESTIMATES

	ROG	NOx	CO	SO2	PM10
TOTALS (lbs/day,unmitigated)	3.73	3.83	40.21	0.12	23.16

SUM OF AREA AND OPERATIONAL EMISSION ESTIMATES

	ROG	NOx	CO	SO2	PM10
TOTALS (lbs/day,unmitigated)	3.90	5.08	41.29	0.12	23.16

URBEMIS 2002 For Windows 7.5.0

File Name: P:\Projects - All Users\10800-00+\10953-00 Lake Forest Opportunities Study EIR\EIR\A  
Project Name: City of Lake Forest EIR - Existing General Plan Operational Emissions (Site 5)  
Project Location: South Coast Air Basin (Los Angeles area)  
On-Road Motor Vehicle Emissions Based on EMFAC2002 version 2.2

SUMMARY REPORT  
(Pounds/Day - Winter)

AREA SOURCE EMISSION ESTIMATES

	ROG	NOx	CO	SO2	PM10
TOTALS (lbs/day,unmitigated)	0.09	1.24	0.50	0.00	0.00

OPERATIONAL (VEHICLE) EMISSION ESTIMATES

	ROG	NOx	CO	SO2	PM10
TOTALS (lbs/day,unmitigated)	4.00	4.97	44.02	0.11	23.16

SUM OF AREA AND OPERATIONAL EMISSION ESTIMATES

	ROG	NOx	CO	SO2	PM10
TOTALS (lbs/day,unmitigated)	4.09	6.22	44.52	0.11	23.16

URBEMIS 2002 For Windows 7.5.0

File Name: P:\Projects - All Users\10800-00+\10953-00 Lake Forest Opportunities Study EIR\EIR\A  
Project Name: City of Lake Forest EIR - Existing General Plan Operational Emissions (Site 5)  
Project Location: South Coast Air Basin (Los Angeles area)  
On-Road Motor Vehicle Emissions Based on EMFAC2002 version 2.2

SUMMARY REPORT  
(Tons/Year)

AREA SOURCE EMISSION ESTIMATES

	ROG	NOx	CO	SO2	PM10
TOTALS (tpy, unmitigated)	0.02	0.23	0.14	0.00	0.00

OPERATIONAL (VEHICLE) EMISSION ESTIMATES

	ROG	NOx	CO	SO2	PM10
TOTALS (tpy, unmitigated)	0.70	0.77	7.57	0.02	4.23

SUM OF AREA AND OPERATIONAL EMISSION ESTIMATES

	ROG	NOx	CO	SO2	PM10
TOTALS (tpy, unmitigated)	0.72	1.00	7.71	0.02	4.23

URBEMIS 2002 For Windows 7.5.0

File Name: P:\Projects - All Users\10800-00+\10953-00 Lake Forest Opportunities Study EIR\EIR\A  
Project Name: City of Lake Forest EIR - Existing General Plan Operational Emissions (Site 5)  
Project Location: South Coast Air Basin (Los Angeles area)  
On-Road Motor Vehicle Emissions Based on EMFAC2002 version 2.2

DETAIL REPORT  
(Pounds/Day - Winter)

AREA SOURCE EMISSION ESTIMATES (Winter Pounds per Day, Unmitigated)					
Source	ROG	NOx	CO	SO2	PM10
Natural Gas	0.09	1.24	0.50	-	0.00
Wood Stoves	0.00	0.00	0.00	0.00	0.00
Fireplaces	0.00	0.00	0.00	0.00	0.00
Landscaping - No winter emissions					
Consumer Prdcts	0.00	-	-	-	-
TOTALS (lbs/day, unmitigated)	0.09	1.24	0.50	0.00	0.00

UNMITIGATED OPERATIONAL EMISSIONS

	ROG	NOx	CO	SO2	PM10
General office building	4.00	4.97	44.02	0.11	23.16
TOTAL EMISSIONS (lbs/day)	4.00	4.97	44.02	0.11	23.16

Does not include correction for passby trips.  
 Does not include double counting adjustment for internal trips.

OPERATIONAL (Vehicle) EMISSION ESTIMATES

Analysis Year: 2030 Temperature (F): 50 Season: Winter

EMFAC Version: EMFAC2002 (9/2002)

Summary of Land Uses:

Unit Type	Trip Rate	Size	Total Trips
General office building	11.49 trips / 1000 sq. ft.	186.33	2,140.93

Vehicle Assumptions:

Fleet Mix:

Vehicle Type	Percent Type	Non-Catalyst	Catalyst	Diesel
Light Auto	57.58	0.00	100.00	0.00
Light Truck < 3,750 lbs	17.44	0.00	100.00	0.00
Light Truck 3,751- 5,750	18.32	0.00	100.00	0.00
Med Truck 5,751- 8,500	1.33	0.00	100.00	0.00
Lite-Heavy 8,501-10,000	0.18	0.00	80.00	20.00
Lite-Heavy 10,001-14,000	0.05	0.00	66.70	33.30
Med-Heavy 14,001-33,000	0.16	0.00	22.20	77.80
Heavy-Heavy 33,001-60,000	0.12	0.00	0.00	100.00
Line Haul > 60,000 lbs	0.00	0.00	0.00	100.00
Urban Bus	0.22	0.00	50.00	50.00
Motorcycle	1.65	33.30	66.70	0.00
School Bus	0.11	0.00	0.00	100.00
Motor Home	2.84	0.00	92.30	7.70

Travel Conditions

	Residential			Commercial		
	Home-Work	Home-Shop	Home-Other	Commute	Non-Work	Customer
Urban Trip Length (miles)	11.5	4.9	6.0	10.3	5.5	5.5
Rural Trip Length (miles)	11.5	4.9	6.0	10.3	5.5	5.5
Trip Speeds (mph)	35.0	40.0	40.0	40.0	40.0	40.0
% of Trips - Residential	20.0	37.0	43.0			

% of Trips - Commercial (by land use)

General office building	35.0	17.5	47.5
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Changes made to the default values for Land Use Trip Percentages

Changes made to the default values for Area

The wood stove option switch changed from on to off.  
The fireplace option switch changed from on to off.  
The consumer products option switch changed from on to off.

Changes made to the default values for Operations

The light auto percentage changed from 52.5 to 57.58.  
The light truck < 3750 lbs percentage changed from 15.9 to 17.44.  
The light truck 3751-5750 percentage changed from 16.7 to 18.32.  
The med truck 5751-8500 percentage changed from 7.6 to 1.33.  
The lite-heavy truck 8501-10000 percentage changed from 1.0 to 0.18.  
The lite-heavy truck 10001-14000 percentage changed from 0.3 to 0.05.  
The med-heavy truck 14001-33000 percentage changed from 0.9 to 0.16.  
The heavy-heavy truck 33001-60000 percentage changed from 0.7 to 0.12.  
The urban bus percentage changed from 0.2 to 0.22.  
The motorcycle percentage changed from 1.5 to 1.65.  
The school bus percentage changed from 0.1 to 0.11.  
The motorhome percentage changed from 2.6 to 2.84.  
The operational emission year changed from 2004 to 2030.  
The operational winter selection item changed from 3 to 2.  
The operational summer temperature changed from 90 to 75.  
The operational summer selection item changed from 8 to 5.  
The travel mode environment settings changed from both to: none

URBEMIS 2002 For Windows 7.5.0

File Name: P:\Projects - All Users\10800-00+\10953-00 Lake Forest Opportunities Study EIR\EIR\A  
Project Name: City of Lake Forest EIR - Existing General Plan Operational Emissions (Site 5)  
Project Location: South Coast Air Basin (Los Angeles area)  
On-Road Motor Vehicle Emissions Based on EMFAC2002 version 2.2

DETAIL REPORT  
(Pounds/Day - Summer)

AREA SOURCE EMISSION ESTIMATES (Summer Pounds per Day, Unmitigated)					
Source	ROG	NOx	CO	SO2	PM10
Natural Gas	0.09	1.24	0.50	-	0.00
Wood Stoves - No summer emissions					
Fireplaces - No summer emissions					
Landscaping	0.08	0.01	0.58	0.00	0.00
Consumer Prdcts	0.00	-	-	-	-
TOTALS (lbs/day, unmitigated)	0.17	1.25	1.08	0.00	0.00

UNMITIGATED OPERATIONAL EMISSIONS

	ROG	NOx	CO	SO2	PM10
General office building	3.73	3.83	40.21	0.12	23.16
TOTAL EMISSIONS (lbs/day)	3.73	3.83	40.21	0.12	23.16

Does not include correction for passby trips.  
 Does not include double counting adjustment for internal trips.

OPERATIONAL (Vehicle) EMISSION ESTIMATES

Analysis Year: 2030 Temperature (F): 75 Season: Summer

EMFAC Version: EMFAC2002 (9/2002)

Summary of Land Uses:

Unit Type	Trip Rate	Size	Total Trips
General office building	11.49 trips / 1000 sq. ft.	186.33	2,140.93

Vehicle Assumptions:

Fleet Mix:

Vehicle Type	Percent Type	Non-Catalyst	Catalyst	Diesel
Light Auto	57.58	0.00	100.00	0.00
Light Truck < 3,750 lbs	17.44	0.00	100.00	0.00
Light Truck 3,751- 5,750	18.32	0.00	100.00	0.00
Med Truck 5,751- 8,500	1.33	0.00	100.00	0.00
Lite-Heavy 8,501-10,000	0.18	0.00	80.00	20.00
Lite-Heavy 10,001-14,000	0.05	0.00	66.70	33.30
Med-Heavy 14,001-33,000	0.16	0.00	22.20	77.80
Heavy-Heavy 33,001-60,000	0.12	0.00	0.00	100.00
Line Haul > 60,000 lbs	0.00	0.00	0.00	100.00
Urban Bus	0.22	0.00	50.00	50.00
Motorcycle	1.65	33.30	66.70	0.00
School Bus	0.11	0.00	0.00	100.00
Motor Home	2.84	0.00	92.30	7.70

Travel Conditions

	Residential			Commercial		
	Home-Work	Home-Shop	Home-Other	Commute	Non-Work	Customer
Urban Trip Length (miles)	11.5	4.9	6.0	10.3	5.5	5.5
Rural Trip Length (miles)	11.5	4.9	6.0	10.3	5.5	5.5
Trip Speeds (mph)	35.0	40.0	40.0	40.0	40.0	40.0
% of Trips - Residential	20.0	37.0	43.0			
% of Trips - Commercial (by land use)						
General office building				35.0	17.5	47.5

Changes made to the default values for Land Use Trip Percentages

Changes made to the default values for Area

The wood stove option switch changed from on to off.  
The fireplace option switch changed from on to off.  
The consumer products option switch changed from on to off.

Changes made to the default values for Operations

The light auto percentage changed from 52.5 to 57.58.  
The light truck < 3750 lbs percentage changed from 15.9 to 17.44.  
The light truck 3751-5750 percentage changed from 16.7 to 18.32.  
The med truck 5751-8500 percentage changed from 7.6 to 1.33.  
The lite-heavy truck 8501-10000 percentage changed from 1.0 to 0.18.  
The lite-heavy truck 10001-14000 percentage changed from 0.3 to 0.05.  
The med-heavy truck 14001-33000 percentage changed from 0.9 to 0.16.  
The heavy-heavy truck 33001-60000 percentage changed from 0.7 to 0.12.  
The urban bus percentage changed from 0.2 to 0.22.  
The motorcycle percentage changed from 1.5 to 1.65.  
The school bus percentage changed from 0.1 to 0.11.  
The motorhome percentage changed from 2.6 to 2.84.  
The operational emission year changed from 2004 to 2030.  
The operational winter selection item changed from 3 to 2.  
The operational summer temperature changed from 90 to 75.  
The operational summer selection item changed from 8 to 5.  
The travel mode environment settings changed from both to: none

URBEMIS 2002 For Windows 7.5.0

File Name: P:\Projects - All Users\10800-00+\10953-00 Lake Forest Opportunities Study EIR\EIR\A  
Project Name: City of Lake Forest EIR - Existing General Plan Operational Emissions (Site 5)  
Project Location: South Coast Air Basin (Los Angeles area)  
On-Road Motor Vehicle Emissions Based on EMFAC2002 version 2.2

DETAIL REPORT  
(Tons/Year)

AREA SOURCE EMISSION ESTIMATES

Source	ROG	NOx	CO	SO2	PM10
Natural Gas	0.02	0.23	0.09	-	0.00
Wood Stoves	0.00	0.00	0.00	0.00	0.00
Fireplaces	0.00	0.00	0.00	0.00	0.00
Landscaping	0.01	0.00	0.05	0.00	0.00
Consumer Prdcts	0.00	-	-	-	-
TOTALS (tpy, unmitigated)	0.02	0.23	0.14	0.00	0.00

UNMITIGATED OPERATIONAL EMISSIONS

	ROG	NOx	CO	SO2	PM10
General office building	0.70	0.77	7.57	0.02	4.23
TOTAL EMISSIONS (tons/yr)	0.70	0.77	7.57	0.02	4.23

Does not include correction for passby trips.  
 Does not include double counting adjustment for internal trips.

OPERATIONAL (Vehicle) EMISSION ESTIMATES

Analysis Year: 2030 Temperature (F): 75 Season: Annual

EMFAC Version: EMFAC2002 (9/2002)

Summary of Land Uses:

Unit Type	Trip Rate	Size	Total Trips
General office building	11.49 trips / 1000 sq. ft.	186.33	2,140.93

Vehicle Assumptions:

Fleet Mix:

Vehicle Type	Percent Type	Non-Catalyst	Catalyst	Diesel
Light Auto	57.58	0.00	100.00	0.00
Light Truck < 3,750 lbs	17.44	0.00	100.00	0.00
Light Truck 3,751- 5,750	18.32	0.00	100.00	0.00
Med Truck 5,751- 8,500	1.33	0.00	100.00	0.00
Lite-Heavy 8,501-10,000	0.18	0.00	80.00	20.00
Lite-Heavy 10,001-14,000	0.05	0.00	66.70	33.30
Med-Heavy 14,001-33,000	0.16	0.00	22.20	77.80
Heavy-Heavy 33,001-60,000	0.12	0.00	0.00	100.00
Line Haul > 60,000 lbs	0.00	0.00	0.00	100.00
Urban Bus	0.22	0.00	50.00	50.00
Motorcycle	1.65	33.30	66.70	0.00
School Bus	0.11	0.00	0.00	100.00
Motor Home	2.84	0.00	92.30	7.70

Travel Conditions

	Residential			Commercial		
	Home-Work	Home-Shop	Home-Other	Commute	Non-Work	Customer
Urban Trip Length (miles)	11.5	4.9	6.0	10.3	5.5	5.5
Rural Trip Length (miles)	11.5	4.9	6.0	10.3	5.5	5.5
Trip Speeds (mph)	35.0	40.0	40.0	40.0	40.0	40.0
% of Trips - Residential	20.0	37.0	43.0			

% of Trips - Commercial (by land use)

General office building	35.0	17.5	47.5
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Changes made to the default values for Land Use Trip Percentages

Changes made to the default values for Area

The wood stove option switch changed from on to off.  
The fireplcase option switch changed from on to off.  
The consumer products option switch changed from on to off.

Changes made to the default values for Operations

The light auto percentage changed from 52.5 to 57.58.  
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The light truck 3751-5750 percentage changed from 16.7 to 18.32.  
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The lite-heavy truck 8501-10000 percentage changed from 1.0 to 0.18.  
The lite-heavy truck 10001-14000 percentage changed from 0.3 to 0.05.  
The med-heavy truck 14001-33000 percentage changed from 0.9 to 0.16.  
The heavy-heavy truck 33001-60000 percentage changed from 0.7 to 0.12.  
The urban bus percentage changed from 0.2 to 0.22.  
The motorcycle percentage changed from 1.5 to 1.65.  
The school bus percentage changed from 0.1 to 0.11.  
The motorhome percentage changed from 2.6 to 2.84.  
The operational emission year changed from 2004 to 2030.  
The operational winter selection item changed from 3 to 2.  
The operational summer temperature changed from 90 to 75.  
The operational summer selection item changed from 8 to 5.  
The travel mode environment settings changed from both to: none

**EXPLANATION OF CHANGES MADE TO DEFAULT SETTINGS IN URBEMIS 2002**

**Project Number:** 10953-00

**Project Name:** City of Lake Forest Opportunities Study Program EIR - Existing General Plan (Site 5)

The following pages include the printed results of the air pollutant emissions modeling for one of the land use components of the proposed project. The air emissions modeling was conducted using the URBEMIS 2002 for Windows computer program developed for the Yolo-Solano Air Quality Management District in May 2003. URBEMIS 2002 is programmed with EMFAC 2002 emission factors developed by the California Air Resources Board.

As part of this analysis, changes have been made to several of the default values programmed into URBEMIS 2002. These changes were made to more accurately reflect the nature of the proposed land use. Each of these changes are discussed below.

**Vehicle Trip Rates**

The default vehicle trip rate values were changed to be consistent with the traffic impact analysis prepared for the project.

**Vehicle Fleet Mix**

URBEMIS 2002 is programmed with the following state-wide average vehicle fleet mix:

State-Wide Vehicle Type	Total	
Automobiles	52.5%	
Light-Duty Trucks <3,750 pounds	15.9%	
Light-Duty Trucks 3,751-5,750 pounds	16.7%	
Medium-Duty Trucks 5,751-8,500 pounds	7.6%	} 10.50% Total Trucks
Light-Heavy-Duty Trucks 8,501-10,000 pounds	1.0%	
Light-Heavy-Duty Trucks 10,001-14,000 pounds	0.3%	
Medium-Heavy-Duty Trucks 14,001-33,000 pounds	0.9%	
Heavy-Heavy-Duty Trucks 33,001-60,000 pounds	0.7%	
Line-Haul Vehicles	0.0%	
Urban Buses	0.2%	
Motorcycles	1.5%	
School Buses	0.1%	
Motor Homes	2.6%	

However, this state-wide average fleet mix is not appropriate for the majority of land use analyses. The project land use assessed in this analysis is identified below along with the total percentage of trucks (medium and heavy) that are expected for this land use. The following vehicle mix was calculated based on the percentage of trucks associated with this land use. The percentage of trucks for each land use were determined from the 3rd, 4th, 5th, and 6th Editions of the ITE Trip Generation manual.

ITE Code	Project Land Use:	Truck %	ADT	Truck #
210	Single Family	0.44%	0	0
230	Residential Condo	0.88%	0	0
220	Apartment	0.88%	0	0
150	Warehousing	27.00%	0	0
760	Research Center	1.84%	0	0
410	Park	0.44%	0	0
170	Utilities	30.00%	0	0
770	Business Park	1.84%	0	0
151	Mini Warehouse	7.00%	0	0
110	General Light Industry	8.00%	0	0
815	Discount Store	2.10%	0	0
710	General Office	1.84%	2,154	40
Project Totals:			2,154	40
Project Truck %:			1.84%	

Vehicle Type	Total	
Automobiles	57.58%	
Light-Duty Trucks <3,750 pounds	17.44%	
Light-Duty Trucks 3,751-5,750 pounds	18.32%	
Medium-Duty Trucks 5,751-8,500 pounds	1.33%	} 1.84% Total Trucks
Light-Heavy-Duty Trucks 8,501-10,000 pounds	0.18%	
Light-Heavy-Duty Trucks 10,001-14,000 pounds	0.05%	
Medium-Heavy-Duty Trucks 14,001-33,000 pounds	0.16%	
Heavy-Heavy-Duty Trucks 33,001-60,000 pounds	0.12%	
Line-Haul Vehicles	0.00%	
Urban Buses	0.22%	
Motorcycles	1.65%	
School Buses	0.11%	
Motor Homes	2.85%	



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**URBEMIS 2002—Landowner Concept Plan**

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URBEMIS 2002 For Windows 7.5.0

File Name: P:\Projects - All Users\10800-00+\10953-00 Lake Forest Opportunities Study EIR\EIR\A  
Project Name: City of Lake Forest EIR - Landowner Concept Plan Operational Emissions (Site 1)  
Project Location: South Coast Air Basin (Los Angeles area)  
On-Road Motor Vehicle Emissions Based on EMFAC2002 version 2.2

SUMMARY REPORT  
(Pounds/Day - Summer)

AREA SOURCE EMISSION ESTIMATES

	ROG	NOx	CO	SO2	PM10
TOTALS (lbs/day,unmitigated)	143.26	28.77	25.71	0.35	0.08

OPERATIONAL (VEHICLE) EMISSION ESTIMATES

	ROG	NOx	CO	SO2	PM10
TOTALS (lbs/day,unmitigated)	47.84	44.46	476.55	1.41	268.62

SUM OF AREA AND OPERATIONAL EMISSION ESTIMATES

	ROG	NOx	CO	SO2	PM10
TOTALS (lbs/day,unmitigated)	191.10	73.23	502.26	1.75	268.71

URBEMIS 2002 For Windows 7.5.0

File Name: P:\Projects - All Users\10800-00+\10953-00 Lake Forest Opportunities Study EIR\EIR\A  
Project Name: City of Lake Forest EIR - Landowner Concept Plan Operational Emissions (Site 1)  
Project Location: South Coast Air Basin (Los Angeles area)  
On-Road Motor Vehicle Emissions Based on EMFAC2002 version 2.2

SUMMARY REPORT  
(Pounds/Day - Winter)

AREA SOURCE EMISSION ESTIMATES

	ROG	NOx	CO	SO2	PM10
TOTALS (lbs/day,unmitigated)	141.63	28.60	12.11	0.00	0.05

OPERATIONAL (VEHICLE) EMISSION ESTIMATES

	ROG	NOx	CO	SO2	PM10
TOTALS (lbs/day,unmitigated)	49.13	57.75	527.56	1.30	268.62

SUM OF AREA AND OPERATIONAL EMISSION ESTIMATES

	ROG	NOx	CO	SO2	PM10
TOTALS (lbs/day,unmitigated)	190.76	86.34	539.67	1.30	268.68

URBEMIS 2002 For Windows 7.5.0

File Name: P:\Projects - All Users\10800-00+\10953-00 Lake Forest Opportunities Study EIR\EIR\A  
Project Name: City of Lake Forest EIR - Landowner Concept Plan Operational Emissions (Site 1)  
Project Location: South Coast Air Basin (Los Angeles area)  
On-Road Motor Vehicle Emissions Based on EMFAC2002 version 2.2

SUMMARY REPORT  
(Tons/Year)

AREA SOURCE EMISSION ESTIMATES

	ROG	NOx	CO	SO2	PM10
TOTALS (tpy, unmitigated)	25.99	5.23	3.43	0.03	0.01

OPERATIONAL (VEHICLE) EMISSION ESTIMATES

	ROG	NOx	CO	SO2	PM10
TOTALS (tpy, unmitigated)	8.81	8.92	90.07	0.25	49.02

SUM OF AREA AND OPERATIONAL EMISSION ESTIMATES

	ROG	NOx	CO	SO2	PM10
TOTALS (tpy, unmitigated)	34.80	14.16	93.51	0.28	49.04

URBEMIS 2002 For Windows 7.5.0

File Name: P:\Projects - All Users\10800-00+\10953-00 Lake Forest Opportunities Study EIR\EIR\A  
Project Name: City of Lake Forest EIR - Landowner Concept Plan Operational Emissions (Site 1)  
Project Location: South Coast Air Basin (Los Angeles area)  
On-Road Motor Vehicle Emissions Based on EMFAC2002 version 2.2

DETAIL REPORT  
(Pounds/Day - Winter)

AREA SOURCE EMISSION ESTIMATES (Winter Pounds per Day, Unmitigated)						
Source	ROG	NOx	CO	SO2	PM10	
Natural Gas	2.20	28.60	12.11	-	0.05	
Wood Stoves	0.00	0.00	0.00	0.00	0.00	
Fireplaces	0.00	0.00	0.00	0.00	0.00	
Landscaping - No winter emissions						
Consumer Prdcts	139.43	-	-	-	-	
TOTALS (lbs/day, unmitigated)	141.63	28.60	12.11	0.00	0.05	

UNMITIGATED OPERATIONAL EMISSIONS

	ROG	NOx	CO	SO2	PM10
Single family housing	15.01	17.34	160.23	0.40	80.86
Apartments low rise	5.58	6.38	58.94	0.15	29.74
Condo/townhouse general	11.91	13.47	124.50	0.31	62.83
City park	1.46	1.81	16.17	0.04	8.30
Free-standing discount st	10.18	12.58	112.55	0.27	57.58
Office park	4.99	6.17	55.17	0.14	29.32
<b>TOTAL EMISSIONS (lbs/day)</b>	<b>49.13</b>	<b>57.75</b>	<b>527.56</b>	<b>1.30</b>	<b>268.62</b>

Does not include correction for passby trips.  
Includes a double counting reduction for internal trips.

OPERATIONAL (Vehicle) EMISSION ESTIMATES

Analysis Year: 2030 Temperature (F): 50 Season: Winter

EMFAC Version: EMFAC2002 (9/2002)

Summary of Land Uses:

Unit Type	Trip Rate	Size	Total Trips
Single family housing	8.68 trips / dwelling units	924.00	8,020.32
Apartments low rise	5.90 trips / dwelling units	500.00	2,950.00
Condo/townhouse general	4.37 trips / dwelling units	1,426.00	6,231.62
City park	50.00 trips / acres	19.20	960.00
Free-standing discount st	56.94 trips / 1000 sq. ft.	120.00	6,832.80
Office park	12.47 trips / 1000 sq. ft.	200.00	2,494.00

Vehicle Assumptions:

Fleet Mix:

Vehicle Type	Percent Type	Non-Catalyst	Catalyst	Diesel
Light Auto	58.01	0.00	100.00	0.00
Light Truck < 3,750 lbs	17.57	0.00	100.00	0.00
Light Truck 3,751- 5,750	18.45	0.00	100.00	0.00
Med Truck 5,751- 8,500	0.80	0.00	100.00	0.00
Lite-Heavy 8,501-10,000	0.11	0.00	80.00	20.00
Lite-Heavy 10,001-14,000	0.03	0.00	66.70	33.30
Med-Heavy 14,001-33,000	0.10	0.00	22.20	77.80
Heavy-Heavy 33,001-60,000	0.07	0.00	0.00	100.00
Line Haul > 60,000 lbs	0.00	0.00	0.00	100.00
Urban Bus	0.22	0.00	50.00	50.00
Motorcycle	1.66	33.30	66.70	0.00
School Bus	0.11	0.00	0.00	100.00
Motor Home	2.87	0.00	92.30	7.70

Travel Conditions

	Residential			Commercial		
	Home-Work	Home-Shop	Home-Other	Commute	Non-Work	Customer
Urban Trip Length (miles)	11.5	4.9	6.0	10.3	5.5	5.5
Rural Trip Length (miles)	11.5	4.9	6.0	10.3	5.5	5.5
Trip Speeds (mph)	35.0	40.0	40.0	40.0	40.0	40.0
% of Trips - Residential	20.0	37.0	43.0			

% of Trips - Commercial (by land use)

City park	5.0	2.5	92.5
Free-standing discount store	2.0	1.0	97.0
Office park	48.0	24.0	28.0

Changes made to the default values for Land Use Trip Percentages

Changes made to the default values for Area

The wood stove option switch changed from on to off.  
The fireplace option switch changed from on to off.

Changes made to the default values for Operations

The light auto percentage changed from 52.5 to 58.01.  
The light truck < 3750 lbs percentage changed from 15.9 to 17.57.  
The light truck 3751-5750 percentage changed from 16.7 to 18.45.  
The med truck 5751-8500 percentage changed from 7.6 to 0.8.  
The lite-heavy truck 8501-10000 percentage changed from 1.0 to 0.11.  
The lite-heavy truck 10001-14000 percentage changed from 0.3 to 0.03.  
The med-heavy truck 14001-33000 percentage changed from 0.9 to 0.10.  
The heavy-heavy truck 33001-60000 percentage changed from 0.7 to 0.07.  
The urban bus percentage changed from 0.2 to 0.22.  
The motorcycle percentage changed from 1.5 to 1.66.  
The school bus percentage changed from 0.1 to 0.11.  
The motorhome percentage changed from 2.6 to 2.87.  
The operational emission year changed from 2004 to 2030.  
The operational winter selection item changed from 3 to 2.  
The operational summer temperature changed from 90 to 75.  
The operational summer selection item changed from 8 to 5.  
The double counting internal work trip limit changed from to 1381.776.  
The double counting shopping trip limit changed from to 690.888.  
The double counting other trip limit changed from to 7396.8342.  
The travel mode environment settings changed from both to: none

URBEMIS 2002 For Windows 7.5.0

File Name: P:\Projects - All Users\10800-00+\10953-00 Lake Forest Opportunities Study EIR\EIR\A  
Project Name: City of Lake Forest EIR - Landowner Concept Plan Operational Emissions (Site 1)  
Project Location: South Coast Air Basin (Los Angeles area)  
On-Road Motor Vehicle Emissions Based on EMFAC2002 version 2.2

DETAIL REPORT  
(Pounds/Day - Summer)

AREA SOURCE EMISSION ESTIMATES (Summer Pounds per Day, Unmitigated)					
Source	ROG	NOx	CO	SO2	PM10
Natural Gas	2.20	28.60	12.11	-	0.05
Wood Stoves - No summer emissions					
Fireplaces - No summer emissions					
Landscaping	1.63	0.17	13.61	0.35	0.03
Consumer Prdcts	139.43	-	-	-	-
TOTALS (lbs/day, unmitigated)	143.26	28.77	25.71	0.35	0.08

UNMITIGATED OPERATIONAL EMISSIONS

	ROG	NOx	CO	SO2	PM10
Single family housing	14.52	13.34	145.49	0.42	80.86
Apartments low rise	5.73	4.91	53.51	0.16	29.74
Condo/townhouse general	13.01	10.37	113.04	0.33	62.83
City park	1.26	1.39	14.32	0.04	8.30
Free-standing discount st	8.73	9.71	99.31	0.30	57.58
Office park	4.58	4.74	50.88	0.15	29.32
<b>TOTAL EMISSIONS (lbs/day)</b>	<b>47.84</b>	<b>44.46</b>	<b>476.55</b>	<b>1.41</b>	<b>268.62</b>

Does not include correction for passby trips.  
Includes a double counting reduction for internal trips.

OPERATIONAL (Vehicle) EMISSION ESTIMATES

Analysis Year: 2030 Temperature (F): 75 Season: Summer

EMFAC Version: EMFAC2002 (9/2002)

Summary of Land Uses:

Unit Type	Trip Rate	Size	Total Trips
Single family housing	8.68 trips / dwelling units	924.00	8,020.32
Apartments low rise	5.90 trips / dwelling units	500.00	2,950.00
Condo/townhouse general	4.37 trips / dwelling units	1,426.00	6,231.62
City park	50.00 trips / acres	19.20	960.00
Free-standing discount st	56.94 trips / 1000 sq. ft.	120.00	6,832.80
Office park	12.47 trips / 1000 sq. ft.	200.00	2,494.00

Vehicle Assumptions:

Fleet Mix:

Vehicle Type	Percent Type	Non-Catalyst	Catalyst	Diesel
Light Auto	58.01	0.00	100.00	0.00
Light Truck < 3,750 lbs	17.57	0.00	100.00	0.00
Light Truck 3,751- 5,750	18.45	0.00	100.00	0.00
Med Truck 5,751- 8,500	0.80	0.00	100.00	0.00
Lite-Heavy 8,501-10,000	0.11	0.00	80.00	20.00
Lite-Heavy 10,001-14,000	0.03	0.00	66.70	33.30
Med-Heavy 14,001-33,000	0.10	0.00	22.20	77.80
Heavy-Heavy 33,001-60,000	0.07	0.00	0.00	100.00
Line Haul > 60,000 lbs	0.00	0.00	0.00	100.00
Urban Bus	0.22	0.00	50.00	50.00
Motorcycle	1.66	33.30	66.70	0.00
School Bus	0.11	0.00	0.00	100.00
Motor Home	2.87	0.00	92.30	7.70

Travel Conditions

	Residential			Commercial		
	Home-Work	Home-Shop	Home-Other	Commute	Non-Work	Customer
Urban Trip Length (miles)	11.5	4.9	6.0	10.3	5.5	5.5
Rural Trip Length (miles)	11.5	4.9	6.0	10.3	5.5	5.5
Trip Speeds (mph)	35.0	40.0	40.0	40.0	40.0	40.0
% of Trips - Residential	20.0	37.0	43.0			

% of Trips - Commercial (by land use)

City park	5.0	2.5	92.5
Free-standing discount store	2.0	1.0	97.0
Office park	48.0	24.0	28.0

Changes made to the default values for Land Use Trip Percentages

Changes made to the default values for Area

The wood stove option switch changed from on to off.  
The fireplcase option switch changed from on to off.

Changes made to the default values for Operations

The light auto percentage changed from 52.5 to 58.01.  
The light truck < 3750 lbs percentage changed from 15.9 to 17.57.  
The light truck 3751-5750 percentage changed from 16.7 to 18.45.  
The med truck 5751-8500 percentage changed from 7.6 to 0.8.  
The lite-heavy truck 8501-10000 percentage changed from 1.0 to 0.11.  
The lite-heavy truck 10001-14000 percentage changed from 0.3 to 0.03.  
The med-heavy truck 14001-33000 percentage changed from 0.9 to 0.10.  
The heavy-heavy truck 33001-60000 percentage changed from 0.7 to 0.07.  
The urban bus percentage changed from 0.2 to 0.22.  
The motorcycle percentage changed from 1.5 to 1.66.  
The school bus percentage changed from 0.1 to 0.11.  
The motorhome percentage changed from 2.6 to 2.87.  
The operational emission year changed from 2004 to 2030.  
The operational winter selection item changed from 3 to 2.  
The operational summer temperature changed from 90 to 75.  
The operational summer selection item changed from 8 to 5.  
The double counting internal work trip limit changed from to 1381.776.  
The double counting shopping trip limit changed from to 690.888.  
The double counting other trip limit changed from to 7396.8342.  
The travel mode environment settings changed from both to: none

URBEMIS 2002 For Windows 7.5.0

File Name: P:\Projects - All Users\10800-00+\10953-00 Lake Forest Opportunities Study EIR\EIR\A  
Project Name: City of Lake Forest EIR - Landowner Concept Plan Operational Emissions (Site 1)  
Project Location: South Coast Air Basin (Los Angeles area)  
On-Road Motor Vehicle Emissions Based on EMFAC2002 version 2.2

DETAIL REPORT  
(Tons/Year)

AREA SOURCE EMISSION ESTIMATES

Source	ROG	NOx	CO	SO2	PM10
Natural Gas	0.40	5.22	2.21	-	0.01
Wood Stoves	0.00	0.00	0.00	0.00	0.00
Fireplaces	0.00	0.00	0.00	0.00	0.00
Landscaping	0.15	0.02	1.22	0.03	0.00
Consumer Prdcts	25.45	-	-	-	-
TOTALS (tpy, unmitigated)	25.99	5.23	3.43	0.03	0.01

UNMITIGATED OPERATIONAL EMISSIONS

	ROG	NOx	CO	SO2	PM10
Single family housing	2.68	2.68	27.45	0.08	14.76
Apartments low rise	1.04	0.99	10.10	0.03	5.43
Condo/townhouse general	2.31	2.08	21.33	0.06	11.47
City park	0.24	0.28	2.73	0.01	1.51
Free-standing discount st	1.68	1.95	18.93	0.05	10.51
Office park	0.86	0.95	9.55	0.03	5.35
<b>TOTAL EMISSIONS (tons/yr)</b>	<b>8.81</b>	<b>8.92</b>	<b>90.07</b>	<b>0.25</b>	<b>49.02</b>

Does not include correction for passby trips.  
Includes a double counting reduction for internal trips.

OPERATIONAL (Vehicle) EMISSION ESTIMATES

Analysis Year: 2030 Temperature (F): 75 Season: Annual

EMFAC Version: EMFAC2002 (9/2002)

Summary of Land Uses:

Unit Type	Trip Rate	Size	Total Trips
Single family housing	8.68 trips / dwelling units	924.00	8,020.32
Apartments low rise	5.90 trips / dwelling units	500.00	2,950.00
Condo/townhouse general	4.37 trips / dwelling units	1,426.00	6,231.62
City park	50.00 trips / acres	19.20	960.00
Free-standing discount st	56.94 trips / 1000 sq. ft.	120.00	6,832.80
Office park	12.47 trips / 1000 sq. ft.	200.00	2,494.00

Vehicle Assumptions:

Fleet Mix:

Vehicle Type	Percent Type	Non-Catalyst	Catalyst	Diesel
Light Auto	58.01	0.00	100.00	0.00
Light Truck < 3,750 lbs	17.57	0.00	100.00	0.00
Light Truck 3,751- 5,750	18.45	0.00	100.00	0.00
Med Truck 5,751- 8,500	0.80	0.00	100.00	0.00
Lite-Heavy 8,501-10,000	0.11	0.00	80.00	20.00
Lite-Heavy 10,001-14,000	0.03	0.00	66.70	33.30
Med-Heavy 14,001-33,000	0.10	0.00	22.20	77.80
Heavy-Heavy 33,001-60,000	0.07	0.00	0.00	100.00
Line Haul > 60,000 lbs	0.00	0.00	0.00	100.00
Urban Bus	0.22	0.00	50.00	50.00
Motorcycle	1.66	33.30	66.70	0.00
School Bus	0.11	0.00	0.00	100.00
Motor Home	2.87	0.00	92.30	7.70

Travel Conditions

	Residential			Commercial		
	Home-Work	Home-Shop	Home-Other	Commute	Non-Work	Customer
Urban Trip Length (miles)	11.5	4.9	6.0	10.3	5.5	5.5
Rural Trip Length (miles)	11.5	4.9	6.0	10.3	5.5	5.5
Trip Speeds (mph)	35.0	40.0	40.0	40.0	40.0	40.0
% of Trips - Residential	20.0	37.0	43.0			

% of Trips - Commercial (by land use)

City park	5.0	2.5	92.5
Free-standing discount store	2.0	1.0	97.0
Office park	48.0	24.0	28.0

Changes made to the default values for Land Use Trip Percentages

Changes made to the default values for Area

The wood stove option switch changed from on to off.  
The fireplace option switch changed from on to off.

Changes made to the default values for Operations

The light auto percentage changed from 52.5 to 58.01.  
The light truck < 3750 lbs percentage changed from 15.9 to 17.57.  
The light truck 3751-5750 percentage changed from 16.7 to 18.45.  
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The lite-heavy truck 8501-10000 percentage changed from 1.0 to 0.11.  
The lite-heavy truck 10001-14000 percentage changed from 0.3 to 0.03.  
The med-heavy truck 14001-33000 percentage changed from 0.9 to 0.10.  
The heavy-heavy truck 33001-60000 percentage changed from 0.7 to 0.07.  
The urban bus percentage changed from 0.2 to 0.22.  
The motorcycle percentage changed from 1.5 to 1.66.  
The school bus percentage changed from 0.1 to 0.11.  
The motorhome percentage changed from 2.6 to 2.87.  
The operational emission year changed from 2004 to 2030.  
The operational winter selection item changed from 3 to 2.  
The operational summer temperature changed from 90 to 75.  
The operational summer selection item changed from 8 to 5.  
The double counting internal work trip limit changed from to 1381.776.  
The double counting shopping trip limit changed from to 690.888.  
The double counting other trip limit changed from to 7396.8342.  
The travel mode environment settings changed from both to: none

**EXPLANATION OF CHANGES MADE TO DEFAULT SETTINGS IN URBEMIS 2002**

**Project Number:** 10953-00

**Project Name:** City of Lake Forest Opportunities Study Program EIR - Landowner Concept Plan (Site 1)

The following pages include the printed results of the air pollutant emissions modeling for one of the land use components of the proposed project. The air emissions modeling was conducted using the URBEMIS 2002 for Windows computer program developed for the Yolo-Solano Air Quality Management District in May 2003. URBEMIS 2002 is programmed with EMFAC 2002 emission factors developed by the California Air Resources Board.

As part of this analysis, changes have been made to several of the default values programmed into URBEMIS 2002. These changes were made to more accurately reflect the nature of the proposed land use. Each of these changes are discussed below.

**Vehicle Trip Rates**

The default vehicle trip rate values were changed to be consistent with the traffic impact analysis prepared for the project.

**Vehicle Fleet Mix**

URBEMIS 2002 is programmed with the following state-wide average vehicle fleet mix:

State-Wide Vehicle Type	Total	
Automobiles	52.5%	
Light-Duty Trucks <3,750 pounds	15.9%	
Light-Duty Trucks 3,751-5,750 pounds	16.7%	
Medium-Duty Trucks 5,751-8,500 pounds	7.6%	} 10.50% Total Trucks
Light-Heavy-Duty Trucks 8,501-10,000 pounds	1.0%	
Light-Heavy-Duty Trucks 10,001-14,000 pounds	0.3%	
Medium-Heavy-Duty Trucks 14,001-33,000 pounds	0.9%	
Heavy-Heavy-Duty Trucks 33,001-60,000 pounds	0.7%	
Line-Haul Vehicles	0.0%	
Urban Buses	0.2%	
Motorcycles	1.5%	
School Buses	0.1%	
Motor Homes	2.6%	

However, this state-wide average fleet mix is not appropriate for the majority of land use analyses. The project land use assessed in this analysis is identified below along with the total percentage of trucks (medium and heavy) that are expected for this land use. The following vehicle mix was calculated based on the percentage of trucks associated with this land use. The percentage of trucks for each land use were determined from the 3rd, 4th, 5th, and 6th Editions of the ITE Trip Generation manual.

ITE		Truck %	ADT	Truck #
Code	Project Land Use:			
210	Single Family	0.44%	8,843	39
230	Residential Condo	0.88%	11,622	102
220	Apartment	0.88%	3,360	30
150	Warehousing	27.00%	0	0
760	Research Center	1.84%	0	0
410	Park	0.44%	31	0
170	Utilities	30.00%	0	0
770	Business Park	1.84%	2,552	47
151	Mini Warehouse	7.00%	0	0
110	General Light Industry	8.00%	0	0
815	Discount Store	2.10%	7,645	161
0			0	0
Project Totals:			34,053	378
Project Truck %:			1.11%	

Vehicle Type	Total	
Automobiles	58.01%	
Light-Duty Trucks <3,750 pounds	17.57%	
Light-Duty Trucks 3,751-5,750 pounds	18.45%	
Medium-Duty Trucks 5,751-8,500 pounds	0.80%	} 1.11% Total Trucks
Light-Heavy-Duty Trucks 8,501-10,000 pounds	0.11%	
Light-Heavy-Duty Trucks 10,001-14,000 pounds	0.03%	
Medium-Heavy-Duty Trucks 14,001-33,000 pounds	0.10%	
Heavy-Heavy-Duty Trucks 33,001-60,000 pounds	0.07%	
Line-Haul Vehicles	0.00%	
Urban Buses	0.22%	
Motorcycles	1.66%	
School Buses	0.11%	
Motor Homes	2.87%	

URBEMIS 2002 For Windows 7.5.0

File Name: P:\Projects - All Users\10800-00+\10953-00 Lake Forest Opportunities Study EIR\EIR\A  
Project Name: City of Lake Forest EIR - Landowner Concept Plan Operational Emissions (Site 2)  
Project Location: South Coast Air Basin (Los Angeles area)  
On-Road Motor Vehicle Emissions Based on EMFAC2002 version 2.2

SUMMARY REPORT  
(Pounds/Day - Summer)

AREA SOURCE EMISSION ESTIMATES

	ROG	NOx	CO	SO2	PM10
TOTALS (lbs/day,unmitigated)	57.35	12.99	13.59	0.20	0.04

OPERATIONAL (VEHICLE) EMISSION ESTIMATES

	ROG	NOx	CO	SO2	PM10
TOTALS (lbs/day,unmitigated)	33.07	33.84	352.38	1.05	200.65

SUM OF AREA AND OPERATIONAL EMISSION ESTIMATES

	ROG	NOx	CO	SO2	PM10
TOTALS (lbs/day,unmitigated)	90.42	46.82	365.97	1.25	200.69

URBEMIS 2002 For Windows 7.5.0

File Name: P:\Projects - All Users\10800-00+\10953-00 Lake Forest Opportunities Study EIR\EIR\A  
Project Name: City of Lake Forest EIR - Landowner Concept Plan Operational Emissions (Site 2)  
Project Location: South Coast Air Basin (Los Angeles area)  
On-Road Motor Vehicle Emissions Based on EMFAC2002 version 2.2

SUMMARY REPORT  
(Pounds/Day - Winter)

AREA SOURCE EMISSION ESTIMATES

	ROG	NOx	CO	SO2	PM10
TOTALS (lbs/day,unmitigated)	56.37	12.88	5.44	0.00	0.02

OPERATIONAL (VEHICLE) EMISSION ESTIMATES

	ROG	NOx	CO	SO2	PM10
TOTALS (lbs/day,unmitigated)	36.26	43.84	394.36	0.96	200.65

SUM OF AREA AND OPERATIONAL EMISSION ESTIMATES

	ROG	NOx	CO	SO2	PM10
TOTALS (lbs/day,unmitigated)	92.62	56.73	399.79	0.96	200.67

URBEMIS 2002 For Windows 7.5.0

File Name: P:\Projects - All Users\10800-00+\10953-00 Lake Forest Opportunities Study EIR\EIR\A  
Project Name: City of Lake Forest EIR - Landowner Concept Plan Operational Emissions (Site 2)  
Project Location: South Coast Air Basin (Los Angeles area)  
On-Road Motor Vehicle Emissions Based on EMFAC2002 version 2.2

SUMMARY REPORT  
(Tons/Year)

AREA SOURCE EMISSION ESTIMATES

	ROG	NOx	CO	SO2	PM10
TOTALS (tpy, unmitigated)	10.38	2.36	1.73	0.02	0.01

OPERATIONAL (VEHICLE) EMISSION ESTIMATES

	ROG	NOx	CO	SO2	PM10
TOTALS (tpy, unmitigated)	6.23	6.78	66.86	0.19	36.62

SUM OF AREA AND OPERATIONAL EMISSION ESTIMATES

	ROG	NOx	CO	SO2	PM10
TOTALS (tpy, unmitigated)	16.60	9.14	68.59	0.20	36.62

URBEMIS 2002 For Windows 7.5.0

File Name: P:\Projects - All Users\10800-00+\10953-00 Lake Forest Opportunities Study EIR\EIR\A  
Project Name: City of Lake Forest EIR - Landowner Concept Plan Operational Emissions (Site 2)  
Project Location: South Coast Air Basin (Los Angeles area)  
On-Road Motor Vehicle Emissions Based on EMFAC2002 version 2.2

DETAIL REPORT  
(Pounds/Day - Winter)

AREA SOURCE EMISSION ESTIMATES (Winter Pounds per Day, Unmitigated)					
Source	ROG	NOx	CO	SO2	PM10
Natural Gas	0.99	12.88	5.44	-	0.02
Wood Stoves	0.00	0.00	0.00	0.00	0.00
Fireplaces	0.00	0.00	0.00	0.00	0.00
Landscaping - No winter emissions					
Consumer Prdcts	55.38	-	-	-	-
TOTALS (lbs/day, unmitigated)	56.37	12.88	5.44	0.00	0.02

UNMITIGATED OPERATIONAL EMISSIONS

	ROG	NOx	CO	SO2	PM10
Single family housing	8.91	10.39	95.23	0.24	48.06
Apartments low rise	5.25	6.05	55.48	0.14	28.00
Condo/townhouse general	1.65	1.90	17.41	0.04	8.79
City park	0.79	0.99	8.76	0.02	4.50
Free-standing discount st	19.65	24.51	217.49	0.52	111.30
TOTAL EMISSIONS (lbs/day)	36.26	43.84	394.36	0.96	200.65

Does not include correction for passby trips.  
Includes a double counting reduction for internal trips.

OPERATIONAL (Vehicle) EMISSION ESTIMATES

Analysis Year: 2030 Temperature (F): 50 Season: Winter

EMFAC Version: EMFAC2002 (9/2002)

Summary of Land Uses:

Unit Type	Trip Rate	Size	Total Trips
Single family housing	9.08 trips / dwelling units	525.00	4,767.00
Apartments low rise	5.96 trips / dwelling units	466.00	2,777.36
Condo/townhouse general	6.18 trips / dwelling units	141.00	871.38
City park	50.00 trips / acres	10.40	520.00
Free-standing discount st	73.89 trips / 1000 sq. ft.	178.72	13,205.62

Vehicle Assumptions:

Fleet Mix:

Vehicle Type	Percent Type	Non-Catalyst	Catalyst	Diesel
Light Auto	57.84	0.00	100.00	0.00
Light Truck < 3,750 lbs	17.52	0.00	100.00	0.00
Light Truck 3,751- 5,750	18.40	0.00	100.00	0.00
Med Truck 5,751- 8,500	1.01	0.00	100.00	0.00
Lite-Heavy 8,501-10,000	0.13	0.00	80.00	20.00
Lite-Heavy 10,001-14,000	0.04	0.00	66.70	33.30
Med-Heavy 14,001-33,000	0.12	0.00	22.20	77.80
Heavy-Heavy 33,001-60,000	0.09	0.00	0.00	100.00
Line Haul > 60,000 lbs	0.00	0.00	0.00	100.00
Urban Bus	0.22	0.00	50.00	50.00
Motorcycle	1.65	33.30	66.70	0.00
School Bus	0.12	0.00	0.00	100.00
Motor Home	2.86	0.00	92.30	7.70

Travel Conditions

	Residential			Commercial		
	Home-Work	Home-Shop	Home-Other	Commute	Non-Work	Customer
Urban Trip Length (miles)	11.5	4.9	6.0	10.3	5.5	5.5
Rural Trip Length (miles)	11.5	4.9	6.0	10.3	5.5	5.5
Trip Speeds (mph)	35.0	40.0	40.0	40.0	40.0	40.0
% of Trips - Residential	20.0	37.0	43.0			

% of Trips - Commercial (by land use)

City park	5.0	2.5	92.5
Free-standing discount store	2.0	1.0	97.0

Changes made to the default values for Land Use Trip Percentages

Changes made to the default values for Area

The wood stove option switch changed from on to off.  
The fireplace option switch changed from on to off.

Changes made to the default values for Operations

The light auto percentage changed from 52.5 to 57.84.  
The light truck < 3750 lbs percentage changed from 15.9 to 17.52.  
The light truck 3751-5750 percentage changed from 16.7 to 18.40.  
The med truck 5751-8500 percentage changed from 7.6 to 1.01.  
The lite-heavy truck 8501-10000 percentage changed from 1.0 to 0.13.  
The lite-heavy truck 10001-14000 percentage changed from 0.3 to 0.04.  
The med-heavy truck 14001-33000 percentage changed from 0.9 to 0.12.  
The heavy-heavy truck 33001-60000 percentage changed from 0.7 to 0.09.  
The urban bus percentage changed from 0.2 to 0.22.  
The motorcycle percentage changed from 1.5 to 1.65.  
The school bus percentage changed from 0.1 to 0.12.  
The motorhome percentage changed from 2.6 to 2.86.  
The operational emission year changed from 2004 to 2030.  
The operational winter selection item changed from 3 to 2.  
The operational summer temperature changed from 90 to 75.  
The operational summer selection item changed from 8 to 5.  
The double counting internal work trip limit changed from to 290.112416.  
The double counting shopping trip limit changed from to 145.056208.  
The double counting other trip limit changed from to 3618.7682.  
The travel mode environment settings changed from both to: none

URBEMIS 2002 For Windows 7.5.0

File Name: P:\Projects - All Users\10800-00+\10953-00 Lake Forest Opportunities Study EIR\EIR\A  
Project Name: City of Lake Forest EIR - Landowner Concept Plan Operational Emissions (Site 2)  
Project Location: South Coast Air Basin (Los Angeles area)  
On-Road Motor Vehicle Emissions Based on EMFAC2002 version 2.2

DETAIL REPORT  
(Pounds/Day - Summer)

AREA SOURCE EMISSION ESTIMATES (Summer Pounds per Day, Unmitigated)					
Source	ROG	NOx	CO	SO2	PM10
Natural Gas	0.99	12.88	5.44	-	0.02
Wood Stoves - No summer emissions					
Fireplaces - No summer emissions					
Landscaping	0.99	0.10	8.16	0.20	0.02
Consumer Prdcts	55.38	-	-	-	-
TOTALS (lbs/day, unmitigated)	57.35	12.99	13.59	0.20	0.04

UNMITIGATED OPERATIONAL EMISSIONS

	ROG	NOx	CO	SO2	PM10
Single family housing	8.58	8.00	86.49	0.25	48.06
Apartments low rise	5.39	4.66	50.39	0.15	28.00
Condo/townhouse general	1.68	1.46	15.81	0.05	8.79
City park	0.68	0.76	7.76	0.02	4.50
Free-standing discount st	16.74	18.94	191.94	0.58	111.30
TOTAL EMISSIONS (lbs/day)	33.07	33.84	352.38	1.05	200.65

Does not include correction for passby trips.  
Includes a double counting reduction for internal trips.

OPERATIONAL (Vehicle) EMISSION ESTIMATES

Analysis Year: 2030 Temperature (F): 75 Season: Summer

EMFAC Version: EMFAC2002 (9/2002)

Summary of Land Uses:

Unit Type	Trip Rate	Size	Total Trips
Single family housing	9.08 trips / dwelling units	525.00	4,767.00
Apartments low rise	5.96 trips / dwelling units	466.00	2,777.36
Condo/townhouse general	6.18 trips / dwelling units	141.00	871.38
City park	50.00 trips / acres	10.40	520.00
Free-standing discount st	73.89 trips / 1000 sq. ft.	178.72	13,205.62

Vehicle Assumptions:

Fleet Mix:

Vehicle Type	Percent Type	Non-Catalyst	Catalyst	Diesel
Light Auto	57.84	0.00	100.00	0.00
Light Truck < 3,750 lbs	17.52	0.00	100.00	0.00
Light Truck 3,751- 5,750	18.40	0.00	100.00	0.00
Med Truck 5,751- 8,500	1.01	0.00	100.00	0.00
Lite-Heavy 8,501-10,000	0.13	0.00	80.00	20.00
Lite-Heavy 10,001-14,000	0.04	0.00	66.70	33.30
Med-Heavy 14,001-33,000	0.12	0.00	22.20	77.80
Heavy-Heavy 33,001-60,000	0.09	0.00	0.00	100.00
Line Haul > 60,000 lbs	0.00	0.00	0.00	100.00
Urban Bus	0.22	0.00	50.00	50.00
Motorcycle	1.65	33.30	66.70	0.00
School Bus	0.12	0.00	0.00	100.00
Motor Home	2.86	0.00	92.30	7.70

Travel Conditions

	Residential			Commercial		
	Home-Work	Home-Shop	Home-Other	Commute	Non-Work	Customer
Urban Trip Length (miles)	11.5	4.9	6.0	10.3	5.5	5.5
Rural Trip Length (miles)	11.5	4.9	6.0	10.3	5.5	5.5
Trip Speeds (mph)	35.0	40.0	40.0	40.0	40.0	40.0
% of Trips - Residential	20.0	37.0	43.0			

% of Trips - Commercial (by land use)

City park	5.0	2.5	92.5
Free-standing discount store	2.0	1.0	97.0

Changes made to the default values for Land Use Trip Percentages

Changes made to the default values for Area

The wood stove option switch changed from on to off.  
The fireplace option switch changed from on to off.

Changes made to the default values for Operations

The light auto percentage changed from 52.5 to 57.84.  
The light truck < 3750 lbs percentage changed from 15.9 to 17.52.  
The light truck 3751-5750 percentage changed from 16.7 to 18.40.  
The med truck 5751-8500 percentage changed from 7.6 to 1.01.  
The lite-heavy truck 8501-10000 percentage changed from 1.0 to 0.13.  
The lite-heavy truck 10001-14000 percentage changed from 0.3 to 0.04.  
The med-heavy truck 14001-33000 percentage changed from 0.9 to 0.12.  
The heavy-heavy truck 33001-60000 percentage changed from 0.7 to 0.09.  
The urban bus percentage changed from 0.2 to 0.22.  
The motorcycle percentage changed from 1.5 to 1.65.  
The school bus percentage changed from 0.1 to 0.12.  
The motorhome percentage changed from 2.6 to 2.86.  
The operational emission year changed from 2004 to 2030.  
The operational winter selection item changed from 3 to 2.  
The operational summer temperature changed from 90 to 75.  
The operational summer selection item changed from 8 to 5.  
The double counting internal work trip limit changed from to 290.112416.  
The double counting shopping trip limit changed from to 145.056208.  
The double counting other trip limit changed from to 3618.7682.  
The travel mode environment settings changed from both to: none

URBEMIS 2002 For Windows 7.5.0

File Name: P:\Projects - All Users\10800-00+\10953-00 Lake Forest Opportunities Study EIR\EIR\A  
Project Name: City of Lake Forest EIR - Landowner Concept Plan Operational Emissions (Site 2)  
Project Location: South Coast Air Basin (Los Angeles area)  
On-Road Motor Vehicle Emissions Based on EMFAC2002 version 2.2

DETAIL REPORT  
(Tons/Year)

AREA SOURCE EMISSION ESTIMATES

Source	ROG	NOx	CO	SO2	PM10
Natural Gas	0.18	2.35	0.99	-	0.00
Wood Stoves	0.00	0.00	0.00	0.00	0.00
Fireplaces	0.00	0.00	0.00	0.00	0.00
Landscaping	0.09	0.01	0.73	0.02	0.00
Consumer Prdcts	10.11	-	-	-	-
TOTALS (tpy, unmitigated)	10.38	2.36	1.73	0.02	0.01

UNMITIGATED OPERATIONAL EMISSIONS

	ROG	NOx	CO	SO2	PM10
Single family housing	1.59	1.61	16.32	0.05	8.77
Apartments low rise	0.97	0.94	9.51	0.03	5.11
Condo/townhouse general	0.30	0.29	2.98	0.01	1.60
City park	0.13	0.15	1.48	0.00	0.82
Free-standing discount st	3.23	3.80	36.58	0.10	20.31
TOTAL EMISSIONS (tons/yr)	6.23	6.78	66.86	0.19	36.62

Does not include correction for passby trips.  
Includes a double counting reduction for internal trips.

OPERATIONAL (Vehicle) EMISSION ESTIMATES

Analysis Year: 2030 Temperature (F): 75 Season: Annual

EMFAC Version: EMFAC2002 (9/2002)

Summary of Land Uses:

Unit Type	Trip Rate	Size	Total Trips
Single family housing	9.08 trips / dwelling units	525.00	4,767.00
Apartments low rise	5.96 trips / dwelling units	466.00	2,777.36
Condo/townhouse general	6.18 trips / dwelling units	141.00	871.38
City park	50.00 trips / acres	10.40	520.00
Free-standing discount st	73.89 trips / 1000 sq. ft.	178.72	13,205.62

Vehicle Assumptions:

Fleet Mix:

Vehicle Type	Percent Type	Non-Catalyst	Catalyst	Diesel
Light Auto	57.84	0.00	100.00	0.00
Light Truck < 3,750 lbs	17.52	0.00	100.00	0.00
Light Truck 3,751- 5,750	18.40	0.00	100.00	0.00
Med Truck 5,751- 8,500	1.01	0.00	100.00	0.00
Lite-Heavy 8,501-10,000	0.13	0.00	80.00	20.00
Lite-Heavy 10,001-14,000	0.04	0.00	66.70	33.30
Med-Heavy 14,001-33,000	0.12	0.00	22.20	77.80
Heavy-Heavy 33,001-60,000	0.09	0.00	0.00	100.00
Line Haul > 60,000 lbs	0.00	0.00	0.00	100.00
Urban Bus	0.22	0.00	50.00	50.00
Motorcycle	1.65	33.30	66.70	0.00
School Bus	0.12	0.00	0.00	100.00
Motor Home	2.86	0.00	92.30	7.70

Travel Conditions

	Residential			Commercial		
	Home-Work	Home-Shop	Home-Other	Commute	Non-Work	Customer
Urban Trip Length (miles)	11.5	4.9	6.0	10.3	5.5	5.5
Rural Trip Length (miles)	11.5	4.9	6.0	10.3	5.5	5.5
Trip Speeds (mph)	35.0	40.0	40.0	40.0	40.0	40.0
% of Trips - Residential	20.0	37.0	43.0			

% of Trips - Commercial (by land use)

City park	5.0	2.5	92.5
Free-standing discount store	2.0	1.0	97.0

Changes made to the default values for Land Use Trip Percentages

Changes made to the default values for Area

The wood stove option switch changed from on to off.  
The fireplcase option switch changed from on to off.

Changes made to the default values for Operations

The light auto percentage changed from 52.5 to 57.84.  
The light truck < 3750 lbs percentage changed from 15.9 to 17.52.  
The light truck 3751-5750 percentage changed from 16.7 to 18.40.  
The med truck 5751-8500 percentage changed from 7.6 to 1.01.  
The lite-heavy truck 8501-10000 percentage changed from 1.0 to 0.13.  
The lite-heavy truck 10001-14000 percentage changed from 0.3 to 0.04.  
The med-heavy truck 14001-33000 percentage changed from 0.9 to 0.12.  
The heavy-heavy truck 33001-60000 percentage changed from 0.7 to 0.09.  
The urban bus percentage changed from 0.2 to 0.22.  
The motorcycle percentage changed from 1.5 to 1.65.  
The school bus percentage changed from 0.1 to 0.12.  
The motorhome percentage changed from 2.6 to 2.86.  
The operational emission year changed from 2004 to 2030.  
The operational winter selection item changed from 3 to 2.  
The operational summer temperature changed from 90 to 75.  
The operational summer selection item changed from 8 to 5.  
The double counting internal work trip limit changed from to 290.112416.  
The double counting shopping trip limit changed from to 145.056208.  
The double counting other trip limit changed from to 3618.7682.  
The travel mode environment settings changed from both to: none

**EXPLANATION OF CHANGES MADE TO DEFAULT SETTINGS IN URBEMIS 2002**

**Project Number:** 10953-00

**Project Name:** City of Lake Forest Opportunities Study Program EIR - Landowner Concept Plan (Site 2)

The following pages include the printed results of the air pollutant emissions modeling for one of the land use components of the proposed project. The air emissions modeling was conducted using the URBEMIS 2002 for Windows computer program developed for the Yolo-Solano Air Quality Management District in May 2003. URBEMIS 2002 is programmed with EMFAC 2002 emission factors developed by the California Air Resources Board.

As part of this analysis, changes have been made to several of the default values programmed into URBEMIS 2002. These changes were made to more accurately reflect the nature of the proposed land use. Each of these changes are discussed below.

**Vehicle Trip Rates**

The default vehicle trip rate values were changed to be consistent with the traffic impact analysis prepared for the project.

**Vehicle Fleet Mix**

URBEMIS 2002 is programmed with the following state-wide average vehicle fleet mix:

State-Wide Vehicle Type	Total	
Automobiles	52.5%	
Light-Duty Trucks <3,750 pounds	15.9%	
Light-Duty Trucks 3,751-5,750 pounds	16.7%	
Medium-Duty Trucks 5,751-8,500 pounds	7.6%	} 10.50% Total Trucks
Light-Heavy-Duty Trucks 8,501-10,000 pounds	1.0%	
Light-Heavy-Duty Trucks 10,001-14,000 pounds	0.3%	
Medium-Heavy-Duty Trucks 14,001-33,000 pounds	0.9%	
Heavy-Heavy-Duty Trucks 33,001-60,000 pounds	0.7%	
Line-Haul Vehicles	0.0%	
Urban Buses	0.2%	
Motorcycles	1.5%	
School Buses	0.1%	
Motor Homes	2.6%	

However, this state-wide average fleet mix is not appropriate for the majority of land use analyses. The project land use assessed in this analysis is identified below along with the total percentage of trucks (medium and heavy) that are expected for this land use. The following vehicle mix was calculated based on the percentage of trucks associated with this land use. The percentage of trucks for each land use were determined from the 3rd, 4th, 5th, and 6th Editions of the ITE Trip Generation manual.

ITE		Truck %	ADT	Truck #
Code	Project Land Use:			
210	Single Family	0.44%	5,024	22
230	Residential Condo	0.88%	1,149	10
220	Apartment	0.88%	3,132	28
150	Warehousing	27.00%	0	0
760	Research Center	1.84%	0	0
410	Park	0.44%	16	0
170	Utilities	30.00%	0	0
770	Business Park	1.84%	0	0
151	Mini Warehouse	7.00%	0	0
110	General Light Industry	8.00%	0	0
815	Discount Store	2.10%	9,905	208
0			0	0
		Project Totals:	19,226	268
		Project Truck %:	1.39%	

Vehicle Type	Total	
Automobiles	57.84%	
Light-Duty Trucks <3,750 pounds	17.52%	
Light-Duty Trucks 3,751-5,750 pounds	18.40%	
Medium-Duty Trucks 5,751-8,500 pounds	1.01%	} 1.39% Total Trucks
Light-Heavy-Duty Trucks 8,501-10,000 pounds	0.13%	
Light-Heavy-Duty Trucks 10,001-14,000 pounds	0.04%	
Medium-Heavy-Duty Trucks 14,001-33,000 pounds	0.12%	
Heavy-Heavy-Duty Trucks 33,001-60,000 pounds	0.09%	
Line-Haul Vehicles	0.00%	
Urban Buses	0.22%	
Motorcycles	1.65%	
School Buses	0.11%	
Motor Homes	2.86%	

URBEMIS 2002 For Windows 7.5.0

File Name: P:\Projects - All Users\10800-00+\10953-00 Lake Forest Opportunities Study EIR\EIR\A  
Project Name: City of Lake Forest OEIR - Landowner Concept Plan Operational Emissions (Site 3)  
Project Location: South Coast Air Basin (Los Angeles area)  
On-Road Motor Vehicle Emissions Based on EMFAC2002 version 2.2

SUMMARY REPORT  
(Pounds/Day - Summer)

AREA SOURCE EMISSION ESTIMATES

	ROG	NOx	CO	SO2	PM10
TOTALS (lbs/day,unmitigated)	49.59	7.55	3.79	0.00	0.02

OPERATIONAL (VEHICLE) EMISSION ESTIMATES

	ROG	NOx	CO	SO2	PM10
TOTALS (lbs/day,unmitigated)	11.56	9.91	107.96	0.32	60.26

SUM OF AREA AND OPERATIONAL EMISSION ESTIMATES

	ROG	NOx	CO	SO2	PM10
TOTALS (lbs/day,unmitigated)	61.15	17.46	111.75	0.32	60.27

URBEMIS 2002 For Windows 7.5.0

File Name: P:\Projects - All Users\10800-00+\10953-00 Lake Forest Opportunities Study EIR\EIR\A  
Project Name: City of Lake Forest OEIR - Landowner Concept Plan Operational Emissions (Site 3)  
Project Location: South Coast Air Basin (Los Angeles area)  
On-Road Motor Vehicle Emissions Based on EMFAC2002 version 2.2

SUMMARY REPORT  
(Pounds/Day - Winter)

AREA SOURCE EMISSION ESTIMATES

	ROG	NOx	CO	SO2	PM10
TOTALS (lbs/day,unmitigated)	49.51	7.54	3.21	0.00	0.01

OPERATIONAL (VEHICLE) EMISSION ESTIMATES

	ROG	NOx	CO	SO2	PM10
TOTALS (lbs/day,unmitigated)	11.25	12.89	119.12	0.29	60.26

SUM OF AREA AND OPERATIONAL EMISSION ESTIMATES

	ROG	NOx	CO	SO2	PM10
TOTALS (lbs/day,unmitigated)	60.76	20.43	122.33	0.29	60.27

URBEMIS 2002 For Windows 7.5.0

File Name: P:\Projects - All Users\10800-00+\10953-00 Lake Forest Opportunities Study EIR\EIR\A  
Project Name: City of Lake Forest OEIR - Landowner Concept Plan Operational Emissions (Site 3)  
Project Location: South Coast Air Basin (Los Angeles area)  
On-Road Motor Vehicle Emissions Based on EMFAC2002 version 2.2

SUMMARY REPORT  
(Tons/Year)

AREA SOURCE EMISSION ESTIMATES

	ROG	NOx	CO	SO2	PM10
TOTALS (tpy, unmitigated)	9.04	1.38	0.64	0.00	0.00

OPERATIONAL (VEHICLE) EMISSION ESTIMATES

	ROG	NOx	CO	SO2	PM10
TOTALS (tpy, unmitigated)	2.09	1.99	20.38	0.06	11.00

SUM OF AREA AND OPERATIONAL EMISSION ESTIMATES

	ROG	NOx	CO	SO2	PM10
TOTALS (tpy, unmitigated)	11.13	3.37	21.02	0.06	11.00

URBEMIS 2002 For Windows 7.5.0

File Name: P:\Projects - All Users\10800-00+\10953-00 Lake Forest Opportunities Study EIR\EIR\A  
Project Name: City of Lake Forest OEIR - Landowner Concept Plan Operational Emissions (Site 3)  
Project Location: South Coast Air Basin (Los Angeles area)  
On-Road Motor Vehicle Emissions Based on EMFAC2002 version 2.2

DETAIL REPORT  
(Pounds/Day - Winter)

AREA SOURCE EMISSION ESTIMATES (Winter Pounds per Day, Unmitigated)					
Source	ROG	NOx	CO	SO2	PM10
Natural Gas	0.58	7.54	3.21	-	0.01
Wood Stoves	0.00	0.00	0.00	0.00	0.00
Fireplaces	0.00	0.00	0.00	0.00	0.00
Landscaping - No winter emissions					
Consumer Prdcts	48.92	-	-	-	-
TOTALS (lbs/day, unmitigated)	49.51	7.54	3.21	0.00	0.01

UNMITIGATED OPERATIONAL EMISSIONS

	ROG	NOx	CO	SO2	PM10
Apartments low rise	10.42	11.87	109.95	0.27	55.55
City park	0.83	1.02	9.17	0.02	4.71
TOTAL EMISSIONS (lbs/day)	11.25	12.89	119.12	0.29	60.26

Does not include correction for passby trips.  
 Does not include double counting adjustment for internal trips.

OPERATIONAL (Vehicle) EMISSION ESTIMATES

Analysis Year: 2030 Temperature (F): 50 Season: Winter

EMFAC Version: EMFAC2002 (9/2002)

Summary of Land Uses:

Unit Type	Trip Rate	Size	Total Trips
Apartments low rise	5.51 trips / dwelling units	1,000.00	5,510.00
City park	50.00 trips / acres	10.90	545.00

Vehicle Assumptions:

Fleet Mix:

Vehicle Type	Percent Type	Non-Catalyst	Catalyst	Diesel
Light Auto	58.14	0.00	100.00	0.00
Light Truck < 3,750 lbs	17.61	0.00	100.00	0.00
Light Truck 3,751- 5,750	18.50	0.00	100.00	0.00
Med Truck 5,751- 8,500	0.64	0.00	100.00	0.00
Lite-Heavy 8,501-10,000	0.08	0.00	80.00	20.00
Lite-Heavy 10,001-14,000	0.03	0.00	66.70	33.30
Med-Heavy 14,001-33,000	0.08	0.00	22.20	77.80
Heavy-Heavy 33,001-60,000	0.06	0.00	0.00	100.00
Line Haul > 60,000 lbs	0.00	0.00	0.00	100.00
Urban Bus	0.22	0.00	50.00	50.00
Motorcycle	1.66	33.30	66.70	0.00
School Bus	0.11	0.00	0.00	100.00
Motor Home	2.87	0.00	92.30	7.70

Travel Conditions

	Residential			Commercial		
	Home-Work	Home-Shop	Home-Other	Commute	Non-Work	Customer
Urban Trip Length (miles)	11.5	4.9	6.0	10.3	5.5	5.5
Rural Trip Length (miles)	11.5	4.9	6.0	10.3	5.5	5.5
Trip Speeds (mph)	35.0	40.0	40.0	40.0	40.0	40.0
% of Trips - Residential	20.0	37.0	43.0			
% of Trips - Commercial (by land use)						
City park				5.0	2.5	92.5

Changes made to the default values for Land Use Trip Percentages

Changes made to the default values for Area

The wood stove option switch changed from on to off.  
The fireplace option switch changed from on to off.

Changes made to the default values for Operations

The light auto percentage changed from 52.5 to 58.14.  
The light truck < 3750 lbs percentage changed from 15.9 to 17.61.  
The light truck 3751-5750 percentage changed from 16.7 to 18.50.  
The med truck 5751-8500 percentage changed from 7.6 to 0.64.  
The lite-heavy truck 8501-10000 percentage changed from 1.0 to 0.08.  
The lite-heavy truck 10001-14000 percentage changed from 0.3 to 0.03.  
The med-heavy truck 14001-33000 percentage changed from 0.9 to 0.08.  
The heavy-heavy truck 33001-60000 percentage changed from 0.7 to 0.06.  
The urban bus percentage changed from 0.2 to 0.22.  
The motorcycle percentage changed from 1.5 to 1.66.  
The school bus percentage changed from 0.1 to 0.11.  
The motorhome percentage changed from 2.6 to 2.87.  
The operational emission year changed from 2004 to 2030.  
The operational winter selection item changed from 3 to 2.  
The operational summer temperature changed from 90 to 75.  
The operational summer selection item changed from 8 to 5.  
The double counting internal work trip limit changed from to 27.25.  
The double counting shopping trip limit changed from to 13.625.  
The double counting other trip limit changed from to 504.125.  
The travel mode environment settings changed from both to: none

URBEMIS 2002 For Windows 7.5.0

File Name: P:\Projects - All Users\10800-00+\10953-00 Lake Forest Opportunities Study EIR\EIR\A  
Project Name: City of Lake Forest OEIR - Landowner Concept Plan Operational Emissions (Site 3)  
Project Location: South Coast Air Basin (Los Angeles area)  
On-Road Motor Vehicle Emissions Based on EMFAC2002 version 2.2

DETAIL REPORT  
(Pounds/Day - Summer)

AREA SOURCE EMISSION ESTIMATES (Summer Pounds per Day, Unmitigated)					
Source	ROG	NOx	CO	SO2	PM10
Natural Gas	0.58	7.54	3.21	-	0.01
Wood Stoves - No summer emissions					
Fireplaces - No summer emissions					
Landscaping	0.08	0.01	0.58	0.00	0.00
Consumer Prdcts	48.92	-	-	-	-
TOTALS (lbs/day, unmitigated)	49.59	7.55	3.79	0.00	0.02

UNMITIGATED OPERATIONAL EMISSIONS

	ROG	NOx	CO	SO2	PM10
Apartments low rise	10.85	9.13	99.84	0.29	55.55
City park	0.71	0.79	8.12	0.02	4.71
TOTAL EMISSIONS (lbs/day)	11.56	9.91	107.96	0.32	60.26

Does not include correction for passby trips.  
 Does not include double counting adjustment for internal trips.

OPERATIONAL (Vehicle) EMISSION ESTIMATES

Analysis Year: 2030 Temperature (F): 75 Season: Summer

EMFAC Version: EMFAC2002 (9/2002)

Summary of Land Uses:

Unit Type	Trip Rate	Size	Total Trips
Apartments low rise	5.51 trips / dwelling units	1,000.00	5,510.00
City park	50.00 trips / acres	10.90	545.00

Vehicle Assumptions:

Fleet Mix:

Vehicle Type	Percent Type	Non-Catalyst	Catalyst	Diesel
Light Auto	58.14	0.00	100.00	0.00
Light Truck < 3,750 lbs	17.61	0.00	100.00	0.00
Light Truck 3,751- 5,750	18.50	0.00	100.00	0.00
Med Truck 5,751- 8,500	0.64	0.00	100.00	0.00
Lite-Heavy 8,501-10,000	0.08	0.00	80.00	20.00
Lite-Heavy 10,001-14,000	0.03	0.00	66.70	33.30
Med-Heavy 14,001-33,000	0.08	0.00	22.20	77.80
Heavy-Heavy 33,001-60,000	0.06	0.00	0.00	100.00
Line Haul > 60,000 lbs	0.00	0.00	0.00	100.00
Urban Bus	0.22	0.00	50.00	50.00
Motorcycle	1.66	33.30	66.70	0.00
School Bus	0.11	0.00	0.00	100.00
Motor Home	2.87	0.00	92.30	7.70

Travel Conditions

	Residential			Commercial		
	Home-Work	Home-Shop	Home-Other	Commute	Non-Work	Customer
Urban Trip Length (miles)	11.5	4.9	6.0	10.3	5.5	5.5
Rural Trip Length (miles)	11.5	4.9	6.0	10.3	5.5	5.5
Trip Speeds (mph)	35.0	40.0	40.0	40.0	40.0	40.0
% of Trips - Residential	20.0	37.0	43.0			

% of Trips - Commercial (by land use)

City park	5.0	2.5	92.5
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Changes made to the default values for Land Use Trip Percentages

Changes made to the default values for Area

The wood stove option switch changed from on to off.  
The fireplace option switch changed from on to off.

Changes made to the default values for Operations

The light auto percentage changed from 52.5 to 58.14.  
The light truck < 3750 lbs percentage changed from 15.9 to 17.61.  
The light truck 3751-5750 percentage changed from 16.7 to 18.50.  
The med truck 5751-8500 percentage changed from 7.6 to 0.64.  
The lite-heavy truck 8501-10000 percentage changed from 1.0 to 0.08.  
The lite-heavy truck 10001-14000 percentage changed from 0.3 to 0.03.  
The med-heavy truck 14001-33000 percentage changed from 0.9 to 0.08.  
The heavy-heavy truck 33001-60000 percentage changed from 0.7 to 0.06.  
The urban bus percentage changed from 0.2 to 0.22.  
The motorcycle percentage changed from 1.5 to 1.66.  
The school bus percentage changed from 0.1 to 0.11.  
The motorhome percentage changed from 2.6 to 2.87.  
The operational emission year changed from 2004 to 2030.  
The operational winter selection item changed from 3 to 2.  
The operational summer temperature changed from 90 to 75.  
The operational summer selection item changed from 8 to 5.  
The double counting internal work trip limit changed from to 27.25.  
The double counting shopping trip limit changed from to 13.625.  
The double counting other trip limit changed from to 504.125.  
The travel mode environment settings changed from both to: none

URBEMIS 2002 For Windows 7.5.0

File Name: P:\Projects - All Users\10800-00+\10953-00 Lake Forest Opportunities Study EIR\EIR\A  
Project Name: City of Lake Forest OEIR - Landowner Concept Plan Operational Emissions (Site 3)  
Project Location: South Coast Air Basin (Los Angeles area)  
On-Road Motor Vehicle Emissions Based on EMFAC2002 version 2.2

DETAIL REPORT  
(Tons/Year)

AREA SOURCE EMISSION ESTIMATES

Source	ROG	NOx	CO	SO2	PM10
Natural Gas	0.11	1.38	0.59	-	0.00
Wood Stoves	0.00	0.00	0.00	0.00	0.00
Fireplaces	0.00	0.00	0.00	0.00	0.00
Landscaping	0.01	0.00	0.05	0.00	0.00
Consumer Prdcts	8.93	-	-	-	-
TOTALS (tpy, unmitigated)	9.04	1.38	0.64	0.00	0.00

UNMITIGATED OPERATIONAL EMISSIONS

	ROG	NOx	CO	SO2	PM10
Apartments low rise	1.95	1.83	18.84	0.05	10.14
City park	0.14	0.16	1.55	0.00	0.86
TOTAL EMISSIONS (tons/yr)	2.09	1.99	20.38	0.06	11.00

Does not include correction for passby trips.  
 Does not include double counting adjustment for internal trips.

OPERATIONAL (Vehicle) EMISSION ESTIMATES

Analysis Year: 2030 Temperature (F): 75 Season: Annual

EMFAC Version: EMFAC2002 (9/2002)

Summary of Land Uses:

Unit Type	Trip Rate	Size	Total Trips
Apartments low rise	5.51 trips / dwelling units	1,000.00	5,510.00
City park	50.00 trips / acres	10.90	545.00

Vehicle Assumptions:

Fleet Mix:

Vehicle Type	Percent Type	Non-Catalyst	Catalyst	Diesel
Light Auto	58.14	0.00	100.00	0.00
Light Truck < 3,750 lbs	17.61	0.00	100.00	0.00
Light Truck 3,751- 5,750	18.50	0.00	100.00	0.00
Med Truck 5,751- 8,500	0.64	0.00	100.00	0.00
Lite-Heavy 8,501-10,000	0.08	0.00	80.00	20.00
Lite-Heavy 10,001-14,000	0.03	0.00	66.70	33.30
Med-Heavy 14,001-33,000	0.08	0.00	22.20	77.80
Heavy-Heavy 33,001-60,000	0.06	0.00	0.00	100.00
Line Haul > 60,000 lbs	0.00	0.00	0.00	100.00
Urban Bus	0.22	0.00	50.00	50.00
Motorcycle	1.66	33.30	66.70	0.00
School Bus	0.11	0.00	0.00	100.00
Motor Home	2.87	0.00	92.30	7.70

Travel Conditions

	Residential			Commercial		
	Home-Work	Home-Shop	Home-Other	Commute	Non-Work	Customer
Urban Trip Length (miles)	11.5	4.9	6.0	10.3	5.5	5.5
Rural Trip Length (miles)	11.5	4.9	6.0	10.3	5.5	5.5
Trip Speeds (mph)	35.0	40.0	40.0	40.0	40.0	40.0
% of Trips - Residential	20.0	37.0	43.0			
% of Trips - Commercial (by land use)						
City park				5.0	2.5	92.5

Changes made to the default values for Land Use Trip Percentages

Changes made to the default values for Area

The wood stove option switch changed from on to off.  
The fireplace option switch changed from on to off.

Changes made to the default values for Operations

The light auto percentage changed from 52.5 to 58.14.  
The light truck < 3750 lbs percentage changed from 15.9 to 17.61.  
The light truck 3751-5750 percentage changed from 16.7 to 18.50.  
The med truck 5751-8500 percentage changed from 7.6 to 0.64.  
The lite-heavy truck 8501-10000 percentage changed from 1.0 to 0.08.  
The lite-heavy truck 10001-14000 percentage changed from 0.3 to 0.03.  
The med-heavy truck 14001-33000 percentage changed from 0.9 to 0.08.  
The heavy-heavy truck 33001-60000 percentage changed from 0.7 to 0.06.  
The urban bus percentage changed from 0.2 to 0.22.  
The motorcycle percentage changed from 1.5 to 1.66.  
The school bus percentage changed from 0.1 to 0.11.  
The motorhome percentage changed from 2.6 to 2.87.  
The operational emission year changed from 2004 to 2030.  
The operational winter selection item changed from 3 to 2.  
The operational summer temperature changed from 90 to 75.  
The operational summer selection item changed from 8 to 5.  
The double counting internal work trip limit changed from to 27.25.  
The double counting shopping trip limit changed from to 13.625.  
The double counting other trip limit changed from to 504.125.  
The travel mode environment settings changed from both to: none

**EXPLANATION OF CHANGES MADE TO DEFAULT SETTINGS IN URBEMIS 2002**

**Project Number:** 10953-00

**Project Name:** City of Lake Forest Opportunities Study Program EIR - Landowner Concept Plan (Site 3)

The following pages include the printed results of the air pollutant emissions modeling for one of the land use components of the proposed project. The air emissions modeling was conducted using the URBEMIS 2002 for Windows computer program developed for the Yolo-Solano Air Quality Management District in May 2003. URBEMIS 2002 is programmed with EMFAC 2002 emission factors developed by the California Air Resources Board.

As part of this analysis, changes have been made to several of the default values programmed into URBEMIS 2002. These changes were made to more accurately reflect the nature of the proposed land use. Each of these changes are discussed below.

**Vehicle Trip Rates**

The default vehicle trip rate values were changed to be consistent with the traffic impact analysis prepared for the project.

**Vehicle Fleet Mix**

URBEMIS 2002 is programmed with the following state-wide average vehicle fleet mix:

State-Wide Vehicle Type	Total	
Automobiles	52.5%	
Light-Duty Trucks <3,750 pounds	15.9%	
Light-Duty Trucks 3,751-5,750 pounds	16.7%	
Medium-Duty Trucks 5,751-8,500 pounds	7.6%	} 10.50% Total Trucks
Light-Heavy-Duty Trucks 8,501-10,000 pounds	1.0%	
Light-Heavy-Duty Trucks 10,001-14,000 pounds	0.3%	
Medium-Heavy-Duty Trucks 14,001-33,000 pounds	0.9%	
Heavy-Heavy-Duty Trucks 33,001-60,000 pounds	0.7%	
Line-Haul Vehicles	0.0%	
Urban Buses	0.2%	
Motorcycles	1.5%	
School Buses	0.1%	
Motor Homes	2.6%	

However, this state-wide average fleet mix is not appropriate for the majority of land use analyses. The project land use assessed in this analysis is identified below along with the total percentage of trucks (medium and heavy) that are expected for this land use. The following vehicle mix was calculated based on the percentage of trucks associated with this land use. The percentage of trucks for each land use were determined from the 3rd, 4th, 5th, and 6th Editions of the ITE Trip Generation manual.

ITE Code	Project Land Use:	Truck %	ADT	Truck #
210	Single Family	0.44%	0	0
230	Residential Condo	0.88%	0	0
220	Apartment	0.88%	6,720	59
150	Warehousing	27.00%	0	0
760	Research Center	1.84%	0	0
410	Park	0.44%	17	0
170	Utilities	30.00%	0	0
770	Business Park	1.84%	0	0
151	Mini Warehouse	7.00%	0	0
110	General Light Industry	8.00%	0	0
815	Discount Store	2.10%	0	0
0			0	0
Project Totals:			6,737	59
Project Truck %:			0.88%	

Vehicle Type	Total	
Automobiles	58.14%	
Light-Duty Trucks <3,750 pounds	17.61%	
Light-Duty Trucks 3,751-5,750 pounds	18.50%	
Medium-Duty Trucks 5,751-8,500 pounds	0.64%	} 0.88% Total Trucks
Light-Heavy-Duty Trucks 8,501-10,000 pounds	0.08%	
Light-Heavy-Duty Trucks 10,001-14,000 pounds	0.03%	
Medium-Heavy-Duty Trucks 14,001-33,000 pounds	0.08%	
Heavy-Heavy-Duty Trucks 33,001-60,000 pounds	0.06%	
Line-Haul Vehicles	0.00%	
Urban Buses	0.22%	
Motorcycles	1.66%	
School Buses	0.11%	
Motor Homes	2.88%	

URBEMIS 2002 For Windows 7.5.0

File Name: P:\Projects - All Users\10800-00+\10953-00 Lake Forest Opportunities Study EIR\EIR\A  
Project Name: City of Lake Forest EIR - Landowner Concept Plan Operational Emissions (Site 4)  
Project Location: South Coast Air Basin (Los Angeles area)  
On-Road Motor Vehicle Emissions Based on EMFAC2002 version 2.2

SUMMARY REPORT  
(Pounds/Day - Summer)

AREA SOURCE EMISSION ESTIMATES

	ROG	NOx	CO	SO2	PM10
TOTALS (lbs/day,unmitigated)	71.87	10.94	5.24	0.00	0.02

OPERATIONAL (VEHICLE) EMISSION ESTIMATES

	ROG	NOx	CO	SO2	PM10
TOTALS (lbs/day,unmitigated)	15.53	13.01	142.28	0.42	79.18

SUM OF AREA AND OPERATIONAL EMISSION ESTIMATES

	ROG	NOx	CO	SO2	PM10
TOTALS (lbs/day,unmitigated)	87.39	23.95	147.52	0.42	79.20

URBEMIS 2002 For Windows 7.5.0

File Name: P:\Projects - All Users\10800-00+\10953-00 Lake Forest Opportunities Study EIR\EIR\A  
Project Name: City of Lake Forest EIR - Landowner Concept Plan Operational Emissions (Site 4)  
Project Location: South Coast Air Basin (Los Angeles area)  
On-Road Motor Vehicle Emissions Based on EMFAC2002 version 2.2

SUMMARY REPORT  
(Pounds/Day - Winter)

AREA SOURCE EMISSION ESTIMATES

	ROG	NOx	CO	SO2	PM10
TOTALS (lbs/day,unmitigated)	71.78	10.94	4.65	0.00	0.02

OPERATIONAL (VEHICLE) EMISSION ESTIMATES

	ROG	NOx	CO	SO2	PM10
TOTALS (lbs/day,unmitigated)	14.86	16.91	156.72	0.39	79.18

SUM OF AREA AND OPERATIONAL EMISSION ESTIMATES

	ROG	NOx	CO	SO2	PM10
TOTALS (lbs/day,unmitigated)	86.65	27.85	161.37	0.39	79.20

URBEMIS 2002 For Windows 7.5.0

File Name: P:\Projects - All Users\10800-00+\10953-00 Lake Forest Opportunities Study EIR\EIR\A  
Project Name: City of Lake Forest EIR - Landowner Concept Plan Operational Emissions (Site 4)  
Project Location: South Coast Air Basin (Los Angeles area)  
On-Road Motor Vehicle Emissions Based on EMFAC2002 version 2.2

SUMMARY REPORT  
(Tons/Year)

AREA SOURCE EMISSION ESTIMATES

	ROG	NOx	CO	SO2	PM10
TOTALS (tpy, unmitigated)	13.11	2.00	0.90	0.00	0.00

OPERATIONAL (VEHICLE) EMISSION ESTIMATES

	ROG	NOx	CO	SO2	PM10
TOTALS (tpy, unmitigated)	2.79	2.61	26.84	0.07	14.45

SUM OF AREA AND OPERATIONAL EMISSION ESTIMATES

	ROG	NOx	CO	SO2	PM10
TOTALS (tpy, unmitigated)	15.90	4.61	27.75	0.07	14.45

URBEMIS 2002 For Windows 7.5.0

File Name: P:\Projects - All Users\10800-00+\10953-00 Lake Forest Opportunities Study EIR\EIR\A  
Project Name: City of Lake Forest EIR - Landowner Concept Plan Operational Emissions (Site 4)  
Project Location: South Coast Air Basin (Los Angeles area)  
On-Road Motor Vehicle Emissions Based on EMFAC2002 version 2.2

DETAIL REPORT  
(Pounds/Day - Winter)

AREA SOURCE EMISSION ESTIMATES (Winter Pounds per Day, Unmitigated)					
Source	ROG	NOx	CO	SO2	PM10
Natural Gas	0.84	10.94	4.65	-	0.02
Wood Stoves	0.00	0.00	0.00	0.00	0.00
Fireplaces	0.00	0.00	0.00	0.00	0.00
Landscaping - No winter emissions					
Consumer Prdcts	70.94	-	-	-	-
TOTALS (lbs/day, unmitigated)	71.78	10.94	4.65	0.00	0.02

UNMITIGATED OPERATIONAL EMISSIONS

	ROG	NOx	CO	SO2	PM10
Apartments low rise	14.80	16.83	155.96	0.39	78.79
City park	0.07	0.08	0.76	0.00	0.39
TOTAL EMISSIONS (lbs/day)	14.86	16.91	156.72	0.39	79.18

Does not include correction for passby trips.  
 Does not include double counting adjustment for internal trips.

OPERATIONAL (Vehicle) EMISSION ESTIMATES

Analysis Year: 2030 Temperature (F): 50 Season: Winter

EMFAC Version: EMFAC2002 (9/2002)

Summary of Land Uses:

Unit Type	Trip Rate	Size	Total Trips
Apartments low rise	5.39 trips / dwelling units	1,450.00	7,815.50
City park	50.00 trips / acres	0.90	45.00

Vehicle Assumptions:

Fleet Mix:

Vehicle Type	Percent Type	Non-Catalyst	Catalyst	Diesel
Light Auto	58.14	0.00	100.00	0.00
Light Truck < 3,750 lbs	17.61	0.00	100.00	0.00
Light Truck 3,751- 5,750	18.50	0.00	100.00	0.00
Med Truck 5,751- 8,500	0.64	0.00	100.00	0.00
Lite-Heavy 8,501-10,000	0.08	0.00	80.00	20.00
Lite-Heavy 10,001-14,000	0.03	0.00	66.70	33.30
Med-Heavy 14,001-33,000	0.08	0.00	22.20	77.80
Heavy-Heavy 33,001-60,000	0.06	0.00	0.00	100.00
Line Haul > 60,000 lbs	0.00	0.00	0.00	100.00
Urban Bus	0.22	0.00	50.00	50.00
Motorcycle	1.66	33.30	66.70	0.00
School Bus	0.11	0.00	0.00	100.00
Motor Home	2.87	0.00	92.30	7.70

Travel Conditions

	Residential			Commercial		
	Home-Work	Home-Shop	Home-Other	Commute	Non-Work	Customer
Urban Trip Length (miles)	11.5	4.9	6.0	10.3	5.5	5.5
Rural Trip Length (miles)	11.5	4.9	6.0	10.3	5.5	5.5
Trip Speeds (mph)	35.0	40.0	40.0	40.0	40.0	40.0
% of Trips - Residential	20.0	37.0	43.0			

% of Trips - Commercial (by land use)

City park	5.0	2.5	92.5
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Changes made to the default values for Land Use Trip Percentages

Changes made to the default values for Area

The wood stove option switch changed from on to off.  
The fireplace option switch changed from on to off.

Changes made to the default values for Operations

The light auto percentage changed from 52.5 to 58.14.  
The light truck < 3750 lbs percentage changed from 15.9 to 17.61.  
The light truck 3751-5750 percentage changed from 16.7 to 18.50.  
The med truck 5751-8500 percentage changed from 7.6 to 0.64.  
The lite-heavy truck 8501-10000 percentage changed from 1.0 to 0.08.  
The lite-heavy truck 10001-14000 percentage changed from 0.3 to 0.03.  
The med-heavy truck 14001-33000 percentage changed from 0.9 to 0.08.  
The heavy-heavy truck 33001-60000 percentage changed from 0.7 to 0.06.  
The urban bus percentage changed from 0.2 to 0.22.  
The motorcycle percentage changed from 1.5 to 1.66.  
The school bus percentage changed from 0.1 to 0.11.  
The motorhome percentage changed from 2.6 to 2.87.  
The operational emission year changed from 2004 to 2030.  
The operational winter selection item changed from 3 to 2.  
The operational summer temperature changed from 90 to 75.  
The operational summer selection item changed from 8 to 5.  
The double counting internal work trip limit changed from to 2.25.  
The double counting shopping trip limit changed from to 1.125.  
The double counting other trip limit changed from to 41.625.  
The travel mode environment settings changed from both to: none

URBEMIS 2002 For Windows 7.5.0

File Name: P:\Projects - All Users\10800-00+\10953-00 Lake Forest Opportunities Study EIR\EIR\A  
Project Name: City of Lake Forest EIR - Landowner Concept Plan Operational Emissions (Site 4)  
Project Location: South Coast Air Basin (Los Angeles area)  
On-Road Motor Vehicle Emissions Based on EMFAC2002 version 2.2

DETAIL REPORT  
(Pounds/Day - Summer)

AREA SOURCE EMISSION ESTIMATES (Summer Pounds per Day, Unmitigated)					
Source	ROG	NOx	CO	SO2	PM10
Natural Gas	0.84	10.94	4.65	-	0.02
Wood Stoves - No summer emissions					
Fireplaces - No summer emissions					
Landscaping	0.08	0.01	0.58	0.00	0.00
Consumer Prdcts	70.94	-	-	-	-
TOTALS (lbs/day, unmitigated)	71.87	10.94	5.24	0.00	0.02

UNMITIGATED OPERATIONAL EMISSIONS

	ROG	NOx	CO	SO2	PM10
Apartments low rise	15.47	12.94	141.61	0.41	78.79
City park	0.06	0.07	0.67	0.00	0.39
TOTAL EMISSIONS (lbs/day)	15.53	13.01	142.28	0.42	79.18

Does not include correction for passby trips.  
 Does not include double counting adjustment for internal trips.

OPERATIONAL (Vehicle) EMISSION ESTIMATES

Analysis Year: 2030 Temperature (F): 75 Season: Summer

EMFAC Version: EMFAC2002 (9/2002)

Summary of Land Uses:

Unit Type	Trip Rate	Size	Total Trips
Apartments low rise	5.39 trips / dwelling units	1,450.00	7,815.50
City park	50.00 trips / acres	0.90	45.00

Vehicle Assumptions:

Fleet Mix:

Vehicle Type	Percent Type	Non-Catalyst	Catalyst	Diesel
Light Auto	58.14	0.00	100.00	0.00
Light Truck < 3,750 lbs	17.61	0.00	100.00	0.00
Light Truck 3,751- 5,750	18.50	0.00	100.00	0.00
Med Truck 5,751- 8,500	0.64	0.00	100.00	0.00
Lite-Heavy 8,501-10,000	0.08	0.00	80.00	20.00
Lite-Heavy 10,001-14,000	0.03	0.00	66.70	33.30
Med-Heavy 14,001-33,000	0.08	0.00	22.20	77.80
Heavy-Heavy 33,001-60,000	0.06	0.00	0.00	100.00
Line Haul > 60,000 lbs	0.00	0.00	0.00	100.00
Urban Bus	0.22	0.00	50.00	50.00
Motorcycle	1.66	33.30	66.70	0.00
School Bus	0.11	0.00	0.00	100.00
Motor Home	2.87	0.00	92.30	7.70

Travel Conditions

	Residential			Commercial		
	Home-Work	Home-Shop	Home-Other	Commute	Non-Work	Customer
Urban Trip Length (miles)	11.5	4.9	6.0	10.3	5.5	5.5
Rural Trip Length (miles)	11.5	4.9	6.0	10.3	5.5	5.5
Trip Speeds (mph)	35.0	40.0	40.0	40.0	40.0	40.0
% of Trips - Residential	20.0	37.0	43.0			

% of Trips - Commercial (by land use)

City park	5.0	2.5	92.5
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Changes made to the default values for Land Use Trip Percentages

Changes made to the default values for Area

The wood stove option switch changed from on to off.  
The fireplace option switch changed from on to off.

Changes made to the default values for Operations

The light auto percentage changed from 52.5 to 58.14.  
The light truck < 3750 lbs percentage changed from 15.9 to 17.61.  
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The lite-heavy truck 10001-14000 percentage changed from 0.3 to 0.03.  
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The heavy-heavy truck 33001-60000 percentage changed from 0.7 to 0.06.  
The urban bus percentage changed from 0.2 to 0.22.  
The motorcycle percentage changed from 1.5 to 1.66.  
The school bus percentage changed from 0.1 to 0.11.  
The motorhome percentage changed from 2.6 to 2.87.  
The operational emission year changed from 2004 to 2030.  
The operational winter selection item changed from 3 to 2.  
The operational summer temperature changed from 90 to 75.  
The operational summer selection item changed from 8 to 5.  
The double counting internal work trip limit changed from to 2.25.  
The double counting shopping trip limit changed from to 1.125.  
The double counting other trip limit changed from to 41.625.  
The travel mode environment settings changed from both to: none

URBEMIS 2002 For Windows 7.5.0

File Name: P:\Projects - All Users\10800-00+\10953-00 Lake Forest Opportunities Study EIR\EIR\A  
Project Name: City of Lake Forest EIR - Landowner Concept Plan Operational Emissions (Site 4)  
Project Location: South Coast Air Basin (Los Angeles area)  
On-Road Motor Vehicle Emissions Based on EMFAC2002 version 2.2

DETAIL REPORT  
(Tons/Year)

AREA SOURCE EMISSION ESTIMATES

Source	ROG	NOx	CO	SO2	PM10
Natural Gas	0.15	2.00	0.85	-	0.00
Wood Stoves	0.00	0.00	0.00	0.00	0.00
Fireplaces	0.00	0.00	0.00	0.00	0.00
Landscaping	0.01	0.00	0.05	0.00	0.00
Consumer Prdcts	12.95	-	-	-	-
TOTALS (tpy, unmitigated)	13.11	2.00	0.90	0.00	0.00

UNMITIGATED OPERATIONAL EMISSIONS

	ROG	NOx	CO	SO2	PM10
Apartments low rise	2.78	2.60	26.72	0.07	14.38
City park	0.01	0.01	0.13	0.00	0.07
TOTAL EMISSIONS (tons/yr)	2.79	2.61	26.84	0.07	14.45

Does not include correction for passby trips.  
 Does not include double counting adjustment for internal trips.

OPERATIONAL (Vehicle) EMISSION ESTIMATES

Analysis Year: 2030 Temperature (F): 75 Season: Annual

EMFAC Version: EMFAC2002 (9/2002)

Summary of Land Uses:

Unit Type	Trip Rate	Size	Total Trips
Apartments low rise	5.39 trips / dwelling units	1,450.00	7,815.50
City park	50.00 trips / acres	0.90	45.00

Vehicle Assumptions:

Fleet Mix:

Vehicle Type	Percent Type	Non-Catalyst	Catalyst	Diesel
Light Auto	58.14	0.00	100.00	0.00
Light Truck < 3,750 lbs	17.61	0.00	100.00	0.00
Light Truck 3,751- 5,750	18.50	0.00	100.00	0.00
Med Truck 5,751- 8,500	0.64	0.00	100.00	0.00
Lite-Heavy 8,501-10,000	0.08	0.00	80.00	20.00
Lite-Heavy 10,001-14,000	0.03	0.00	66.70	33.30
Med-Heavy 14,001-33,000	0.08	0.00	22.20	77.80
Heavy-Heavy 33,001-60,000	0.06	0.00	0.00	100.00
Line Haul > 60,000 lbs	0.00	0.00	0.00	100.00
Urban Bus	0.22	0.00	50.00	50.00
Motorcycle	1.66	33.30	66.70	0.00
School Bus	0.11	0.00	0.00	100.00
Motor Home	2.87	0.00	92.30	7.70

Travel Conditions

	Residential			Commercial		
	Home-Work	Home-Shop	Home-Other	Commute	Non-Work	Customer
Urban Trip Length (miles)	11.5	4.9	6.0	10.3	5.5	5.5
Rural Trip Length (miles)	11.5	4.9	6.0	10.3	5.5	5.5
Trip Speeds (mph)	35.0	40.0	40.0	40.0	40.0	40.0
% of Trips - Residential	20.0	37.0	43.0			

% of Trips - Commercial (by land use)

City park	5.0	2.5	92.5
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Changes made to the default values for Land Use Trip Percentages

Changes made to the default values for Area

The wood stove option switch changed from on to off.  
The fireplace option switch changed from on to off.

Changes made to the default values for Operations

The light auto percentage changed from 52.5 to 58.14.  
The light truck < 3750 lbs percentage changed from 15.9 to 17.61.  
The light truck 3751-5750 percentage changed from 16.7 to 18.50.  
The med truck 5751-8500 percentage changed from 7.6 to 0.64.  
The lite-heavy truck 8501-10000 percentage changed from 1.0 to 0.08.  
The lite-heavy truck 10001-14000 percentage changed from 0.3 to 0.03.  
The med-heavy truck 14001-33000 percentage changed from 0.9 to 0.08.  
The heavy-heavy truck 33001-60000 percentage changed from 0.7 to 0.06.  
The urban bus percentage changed from 0.2 to 0.22.  
The motorcycle percentage changed from 1.5 to 1.66.  
The school bus percentage changed from 0.1 to 0.11.  
The motorhome percentage changed from 2.6 to 2.87.  
The operational emission year changed from 2004 to 2030.  
The operational winter selection item changed from 3 to 2.  
The operational summer temperature changed from 90 to 75.  
The operational summer selection item changed from 8 to 5.  
The double counting internal work trip limit changed from to 2.25.  
The double counting shopping trip limit changed from to 1.125.  
The double counting other trip limit changed from to 41.625.  
The travel mode environment settings changed from both to: none

**EXPLANATION OF CHANGES MADE TO DEFAULT SETTINGS IN URBEMIS 2002**

**Project Number:** 10953-00

**Project Name:** City of Lake Forest Opportunities Study Program EIR - Landowner Concept Plan (Site 4)

The following pages include the printed results of the air pollutant emissions modeling for one of the land use components of the proposed project. The air emissions modeling was conducted using the URBEMIS 2002 for Windows computer program developed for the Yolo-Solano Air Quality Management District in May 2003. URBEMIS 2002 is programmed with EMFAC 2002 emission factors developed by the California Air Resources Board.

As part of this analysis, changes have been made to several of the default values programmed into URBEMIS 2002. These changes were made to more accurately reflect the nature of the proposed land use. Each of these changes are discussed below.

**Vehicle Trip Rates**

The default vehicle trip rate values were changed to be consistent with the traffic impact analysis prepared for the project.

**Vehicle Fleet Mix**

URBEMIS 2002 is programmed with the following state-wide average vehicle fleet mix:

State-Wide Vehicle Type	Total	
Automobiles	52.5%	
Light-Duty Trucks <3,750 pounds	15.9%	
Light-Duty Trucks 3,751-5,750 pounds	16.7%	
Medium-Duty Trucks 5,751-8,500 pounds	7.6%	} 10.50% Total Trucks
Light-Heavy-Duty Trucks 8,501-10,000 pounds	1.0%	
Light-Heavy-Duty Trucks 10,001-14,000 pounds	0.3%	
Medium-Heavy-Duty Trucks 14,001-33,000 pounds	0.9%	
Heavy-Heavy-Duty Trucks 33,001-60,000 pounds	0.7%	
Line-Haul Vehicles	0.0%	
Urban Buses	0.2%	
Motorcycles	1.5%	
School Buses	0.1%	
Motor Homes	2.6%	

However, this state-wide average fleet mix is not appropriate for the majority of land use analyses. The project land use assessed in this analysis is identified below along with the total percentage of trucks (medium and heavy) that are expected for this land use. The following vehicle mix was calculated based on the percentage of trucks associated with this land use. The percentage of trucks for each land use were determined from the 3rd, 4th, 5th, and 6th Editions of the ITE Trip Generation manual.

ITE Code	Project Land Use:	Truck %	ADT	Truck #
210	Single Family	0.44%	0	0
230	Residential Condo	0.88%	0	0
220	Apartment	0.88%	9,744	86
150	Warehousing	27.00%	0	0
760	Research Center	1.84%	0	0
410	Park	0.44%	1	0
170	Utilities	30.00%	0	0
770	Business Park	1.84%	0	0
151	Mini Warehouse	7.00%	0	0
110	General Light Industry	8.00%	0	0
815	Discount Store	2.10%	0	0
0			0	0
Project Totals:			9,745	86
Project Truck %:			0.88%	

Vehicle Type	Total	
Automobiles	58.14%	
Light-Duty Trucks <3,750 pounds	17.61%	
Light-Duty Trucks 3,751-5,750 pounds	18.50%	
Medium-Duty Trucks 5,751-8,500 pounds	0.64%	} 0.88% Total Trucks
Light-Heavy-Duty Trucks 8,501-10,000 pounds	0.08%	
Light-Heavy-Duty Trucks 10,001-14,000 pounds	0.03%	
Medium-Heavy-Duty Trucks 14,001-33,000 pounds	0.08%	
Heavy-Heavy-Duty Trucks 33,001-60,000 pounds	0.06%	
Line-Haul Vehicles	0.00%	
Urban Buses	0.22%	
Motorcycles	1.66%	
School Buses	0.11%	
Motor Homes	2.88%	

URBEMIS 2002 For Windows 7.5.0

File Name: P:\Projects - All Users\10800-00+\10953-00 Lake Forest Opportunities Study EIR\EIR\A  
Project Name: City of Lake Forest EIR - Landowner Concept Plan Operational Emissions (Site 5)  
Project Location: South Coast Air Basin (Los Angeles area)  
On-Road Motor Vehicle Emissions Based on EMFAC2002 version 2.2

SUMMARY REPORT  
(Pounds/Day - Summer)

AREA SOURCE EMISSION ESTIMATES

	ROG	NOx	CO	SO2	PM10
TOTALS (lbs/day,unmitigated)	5.13	1.04	1.68	0.02	0.00

OPERATIONAL (VEHICLE) EMISSION ESTIMATES

	ROG	NOx	CO	SO2	PM10
TOTALS (lbs/day,unmitigated)	1.66	1.52	16.75	0.05	9.32

SUM OF AREA AND OPERATIONAL EMISSION ESTIMATES

	ROG	NOx	CO	SO2	PM10
TOTALS (lbs/day,unmitigated)	6.79	2.56	18.43	0.07	9.32

URBEMIS 2002 For Windows 7.5.0

File Name: P:\Projects - All Users\10800-00+\10953-00 Lake Forest Opportunities Study EIR\EIR\A  
Project Name: City of Lake Forest EIR - Landowner Concept Plan Operational Emissions (Site 5)  
Project Location: South Coast Air Basin (Los Angeles area)  
On-Road Motor Vehicle Emissions Based on EMFAC2002 version 2.2

SUMMARY REPORT  
(Pounds/Day - Winter)

AREA SOURCE EMISSION ESTIMATES

	ROG	NOx	CO	SO2	PM10
TOTALS (lbs/day,unmitigated)	4.97	1.02	0.44	0.00	0.00

OPERATIONAL (VEHICLE) EMISSION ESTIMATES

	ROG	NOx	CO	SO2	PM10
TOTALS (lbs/day,unmitigated)	1.73	1.98	18.45	0.05	9.32

SUM OF AREA AND OPERATIONAL EMISSION ESTIMATES

	ROG	NOx	CO	SO2	PM10
TOTALS (lbs/day,unmitigated)	6.70	3.01	18.89	0.05	9.32

URBEMIS 2002 For Windows 7.5.0

File Name: P:\Projects - All Users\10800-00+\10953-00 Lake Forest Opportunities Study EIR\EIR\A  
Project Name: City of Lake Forest EIR - Landowner Concept Plan Operational Emissions (Site 5)  
Project Location: South Coast Air Basin (Los Angeles area)  
On-Road Motor Vehicle Emissions Based on EMFAC2002 version 2.2

SUMMARY REPORT  
(Tons/Year)

AREA SOURCE EMISSION ESTIMATES

	ROG	NOx	CO	SO2	PM10
TOTALS (tpy, unmitigated)	0.92	0.19	0.19	0.00	0.00

OPERATIONAL (VEHICLE) EMISSION ESTIMATES

	ROG	NOx	CO	SO2	PM10
TOTALS (tpy, unmitigated)	0.31	0.31	3.16	0.01	1.70

SUM OF AREA AND OPERATIONAL EMISSION ESTIMATES

	ROG	NOx	CO	SO2	PM10
TOTALS (tpy, unmitigated)	1.23	0.49	3.35	0.01	1.70

URBEMIS 2002 For Windows 7.5.0

File Name: P:\Projects - All Users\10800-00+\10953-00 Lake Forest Opportunities Study EIR\EIR\A  
Project Name: City of Lake Forest EIR - Landowner Concept Plan Operational Emissions (Site 5)  
Project Location: South Coast Air Basin (Los Angeles area)  
On-Road Motor Vehicle Emissions Based on EMFAC2002 version 2.2

DETAIL REPORT  
(Pounds/Day - Winter)

AREA SOURCE EMISSION ESTIMATES (Winter Pounds per Day, Unmitigated)					
Source	ROG	NOx	CO	SO2	PM10
Natural Gas	0.08	1.02	0.44	-	0.00
Wood Stoves	0.00	0.00	0.00	0.00	0.00
Fireplaces	0.00	0.00	0.00	0.00	0.00
Landscaping - No winter emissions					
Consumer Prdcts	4.89	-	-	-	-
TOTALS (lbs/day, unmitigated)	4.97	1.02	0.44	0.00	0.00

UNMITIGATED OPERATIONAL EMISSIONS

	ROG	NOx	CO	SO2	PM10
Single family housing	1.09	1.26	11.74	0.03	5.93
Condo/townhouse general	0.63	0.72	6.71	0.02	3.39
TOTAL EMISSIONS (lbs/day)	1.73	1.98	18.45	0.05	9.32

Does not include correction for passby trips.  
 Does not include double counting adjustment for internal trips.

OPERATIONAL (Vehicle) EMISSION ESTIMATES

Analysis Year: 2030 Temperature (F): 50 Season: Winter

EMFAC Version: EMFAC2002 (9/2002)

Summary of Land Uses:

Unit Type	Trip Rate	Size	Total Trips
Single family housing	10.89 trips / dwelling units	54.00	588.06
Condo/townhouse general	7.31 trips / dwelling units	46.00	336.26

Vehicle Assumptions:

Fleet Mix:

Vehicle Type	Percent Type	Non-Catalyst	Catalyst	Diesel
Light Auto	58.29	0.00	100.00	0.00
Light Truck < 3,750 lbs	17.65	0.00	100.00	0.00
Light Truck 3,751- 5,750	18.54	0.00	100.00	0.00
Med Truck 5,751- 8,500	0.45	0.00	100.00	0.00
Lite-Heavy 8,501-10,000	0.06	0.00	80.00	20.00
Lite-Heavy 10,001-14,000	0.02	0.00	66.70	33.30
Med-Heavy 14,001-33,000	0.05	0.00	22.20	77.80
Heavy-Heavy 33,001-60,000	0.04	0.00	0.00	100.00
Line Haul > 60,000 lbs	0.00	0.00	0.00	100.00
Urban Bus	0.22	0.00	50.00	50.00
Motorcycle	1.67	33.30	66.70	0.00
School Bus	0.11	0.00	0.00	100.00
Motor Home	2.90	0.00	92.30	7.70

Travel Conditions

	Residential			Commercial		
	Home-Work	Home-Shop	Home-Other	Commute	Non-Work	Customer
Urban Trip Length (miles)	11.5	4.9	6.0	10.3	5.5	5.5
Rural Trip Length (miles)	11.5	4.9	6.0	10.3	5.5	5.5
Trip Speeds (mph)	35.0	40.0	40.0	40.0	40.0	40.0
% of Trips - Residential	20.0	37.0	43.0			

Changes made to the default values for Land Use Trip Percentages

Changes made to the default values for Area

The wood stove option switch changed from on to off.  
The fireplcase option switch changed from on to off.

Changes made to the default values for Operations

The light auto percentage changed from 52.5 to 58.29.  
The light truck < 3750 lbs percentage changed from 15.9 to 17.65.  
The light truck 3751-5750 percentage changed from 16.7 to 18.54.  
The med truck 5751-8500 percentage changed from 7.6 to 0.45.  
The lite-heavy truck 8501-10000 percentage changed from 1.0 to 0.06.  
The lite-heavy truck 10001-14000 percentage changed from 0.3 to 0.02.  
The med-heavy truck 14001-33000 percentage changed from 0.9 to 0.05.  
The heavy-heavy truck 33001-60000 percentage changed from 0.7 to 0.04.  
The urban bus percentage changed from 0.2 to 0.22.  
The motorcycle percentage changed from 1.5 to 1.67.  
The school bus percentage changed from 0.1 to 0.11.  
The motorhome percentage changed from 2.6 to 2.90.  
The operational emission year changed from 2004 to 2030.  
The operational winter selection item changed from 3 to 2.  
The operational summer temperature changed from 90 to 75.  
The operational summer selection item changed from 8 to 5.  
The travel mode environment settings changed from both to: none

URBEMIS 2002 For Windows 7.5.0

File Name: P:\Projects - All Users\10800-00+\10953-00 Lake Forest Opportunities Study EIR\EIR\A  
Project Name: City of Lake Forest EIR - Landowner Concept Plan Operational Emissions (Site 5)  
Project Location: South Coast Air Basin (Los Angeles area)  
On-Road Motor Vehicle Emissions Based on EMFAC2002 version 2.2

DETAIL REPORT  
(Pounds/Day - Summer)

AREA SOURCE EMISSION ESTIMATES (Summer Pounds per Day, Unmitigated)					
Source	ROG	NOx	CO	SO2	PM10
Natural Gas	0.08	1.02	0.44	-	0.00
Wood Stoves - No summer emissions					
Fireplaces - No summer emissions					
Landscaping	0.16	0.01	1.24	0.02	0.00
Consumer Prdcts	4.89	-	-	-	-
TOTALS (lbs/day, unmitigated)	5.13	1.04	1.68	0.02	0.00

UNMITIGATED OPERATIONAL EMISSIONS

	ROG	NOx	CO	SO2	PM10
Single family housing	1.03	0.97	10.66	0.03	5.93
Condo/townhouse general	0.63	0.55	6.09	0.02	3.39
TOTAL EMISSIONS (lbs/day)	1.66	1.52	16.75	0.05	9.32

Does not include correction for passby trips.  
 Does not include double counting adjustment for internal trips.

OPERATIONAL (Vehicle) EMISSION ESTIMATES

Analysis Year: 2030 Temperature (F): 75 Season: Summer

EMFAC Version: EMFAC2002 (9/2002)

Summary of Land Uses:

Unit Type	Trip Rate	Size	Total Trips
Single family housing	10.89 trips / dwelling units	54.00	588.06
Condo/townhouse general	7.31 trips / dwelling units	46.00	336.26

Vehicle Assumptions:

Fleet Mix:

Vehicle Type	Percent Type	Non-Catalyst	Catalyst	Diesel
Light Auto	58.29	0.00	100.00	0.00
Light Truck < 3,750 lbs	17.65	0.00	100.00	0.00
Light Truck 3,751- 5,750	18.54	0.00	100.00	0.00
Med Truck 5,751- 8,500	0.45	0.00	100.00	0.00
Lite-Heavy 8,501-10,000	0.06	0.00	80.00	20.00
Lite-Heavy 10,001-14,000	0.02	0.00	66.70	33.30
Med-Heavy 14,001-33,000	0.05	0.00	22.20	77.80
Heavy-Heavy 33,001-60,000	0.04	0.00	0.00	100.00
Line Haul > 60,000 lbs	0.00	0.00	0.00	100.00
Urban Bus	0.22	0.00	50.00	50.00
Motorcycle	1.67	33.30	66.70	0.00
School Bus	0.11	0.00	0.00	100.00
Motor Home	2.90	0.00	92.30	7.70

Travel Conditions

	Residential			Commercial		
	Home-Work	Home-Shop	Home-Other	Commute	Non-Work	Customer
Urban Trip Length (miles)	11.5	4.9	6.0	10.3	5.5	5.5
Rural Trip Length (miles)	11.5	4.9	6.0	10.3	5.5	5.5
Trip Speeds (mph)	35.0	40.0	40.0	40.0	40.0	40.0
% of Trips - Residential	20.0	37.0	43.0			

Changes made to the default values for Land Use Trip Percentages

Changes made to the default values for Area

The wood stove option switch changed from on to off.  
The fireplcase option switch changed from on to off.

Changes made to the default values for Operations

The light auto percentage changed from 52.5 to 58.29.  
The light truck < 3750 lbs percentage changed from 15.9 to 17.65.  
The light truck 3751-5750 percentage changed from 16.7 to 18.54.  
The med truck 5751-8500 percentage changed from 7.6 to 0.45.  
The lite-heavy truck 8501-10000 percentage changed from 1.0 to 0.06.  
The lite-heavy truck 10001-14000 percentage changed from 0.3 to 0.02.  
The med-heavy truck 14001-33000 percentage changed from 0.9 to 0.05.  
The heavy-heavy truck 33001-60000 percentage changed from 0.7 to 0.04.  
The urban bus percentage changed from 0.2 to 0.22.  
The motorcycle percentage changed from 1.5 to 1.67.  
The school bus percentage changed from 0.1 to 0.11.  
The motorhome percentage changed from 2.6 to 2.90.  
The operational emission year changed from 2004 to 2030.  
The operational winter selection item changed from 3 to 2.  
The operational summer temperature changed from 90 to 75.  
The operational summer selection item changed from 8 to 5.  
The travel mode environment settings changed from both to: none

URBEMIS 2002 For Windows 7.5.0

File Name: P:\Projects - All Users\10800-00+\10953-00 Lake Forest Opportunities Study EIR\EIR\A  
Project Name: City of Lake Forest EIR - Landowner Concept Plan Operational Emissions (Site 5)  
Project Location: South Coast Air Basin (Los Angeles area)  
On-Road Motor Vehicle Emissions Based on EMFAC2002 version 2.2

DETAIL REPORT  
(Tons/Year)

AREA SOURCE EMISSION ESTIMATES

Source	ROG	NOx	CO	SO2	PM10
Natural Gas	0.01	0.19	0.08	-	0.00
Wood Stoves	0.00	0.00	0.00	0.00	0.00
Fireplaces	0.00	0.00	0.00	0.00	0.00
Landscaping	0.01	0.00	0.11	0.00	0.00
Consumer Prdcts	0.89	-	-	-	-
TOTALS (tpy, unmitigated)	0.92	0.19	0.19	0.00	0.00

UNMITIGATED OPERATIONAL EMISSIONS

	ROG	NOx	CO	SO2	PM10
Single family housing	0.19	0.19	2.01	0.01	1.08
Condo/townhouse general	0.11	0.11	1.15	0.00	0.62
TOTAL EMISSIONS (tons/yr)	0.31	0.31	3.16	0.01	1.70

Does not include correction for passby trips.  
 Does not include double counting adjustment for internal trips.

OPERATIONAL (Vehicle) EMISSION ESTIMATES

Analysis Year: 2030 Temperature (F): 75 Season: Annual

EMFAC Version: EMFAC2002 (9/2002)

Summary of Land Uses:

Unit Type	Trip Rate	Size	Total Trips
Single family housing	10.89 trips / dwelling units	54.00	588.06
Condo/townhouse general	7.31 trips / dwelling units	46.00	336.26

Vehicle Assumptions:

Fleet Mix:

Vehicle Type	Percent Type	Non-Catalyst	Catalyst	Diesel
Light Auto	58.29	0.00	100.00	0.00
Light Truck < 3,750 lbs	17.65	0.00	100.00	0.00
Light Truck 3,751- 5,750	18.54	0.00	100.00	0.00
Med Truck 5,751- 8,500	0.45	0.00	100.00	0.00
Lite-Heavy 8,501-10,000	0.06	0.00	80.00	20.00
Lite-Heavy 10,001-14,000	0.02	0.00	66.70	33.30
Med-Heavy 14,001-33,000	0.05	0.00	22.20	77.80
Heavy-Heavy 33,001-60,000	0.04	0.00	0.00	100.00
Line Haul > 60,000 lbs	0.00	0.00	0.00	100.00
Urban Bus	0.22	0.00	50.00	50.00
Motorcycle	1.67	33.30	66.70	0.00
School Bus	0.11	0.00	0.00	100.00
Motor Home	2.90	0.00	92.30	7.70

Travel Conditions

	Residential			Commercial		
	Home-Work	Home-Shop	Home-Other	Commute	Non-Work	Customer
Urban Trip Length (miles)	11.5	4.9	6.0	10.3	5.5	5.5
Rural Trip Length (miles)	11.5	4.9	6.0	10.3	5.5	5.5
Trip Speeds (mph)	35.0	40.0	40.0	40.0	40.0	40.0
% of Trips - Residential	20.0	37.0	43.0			

Changes made to the default values for Land Use Trip Percentages

Changes made to the default values for Area

The wood stove option switch changed from on to off.  
The fireplcase option switch changed from on to off.

Changes made to the default values for Operations

The light auto percentage changed from 52.5 to 58.29.  
The light truck < 3750 lbs percentage changed from 15.9 to 17.65.  
The light truck 3751-5750 percentage changed from 16.7 to 18.54.  
The med truck 5751-8500 percentage changed from 7.6 to 0.45.  
The lite-heavy truck 8501-10000 percentage changed from 1.0 to 0.06.  
The lite-heavy truck 10001-14000 percentage changed from 0.3 to 0.02.  
The med-heavy truck 14001-33000 percentage changed from 0.9 to 0.05.  
The heavy-heavy truck 33001-60000 percentage changed from 0.7 to 0.04.  
The urban bus percentage changed from 0.2 to 0.22.  
The motorcycle percentage changed from 1.5 to 1.67.  
The school bus percentage changed from 0.1 to 0.11.  
The motorhome percentage changed from 2.6 to 2.90.  
The operational emission year changed from 2004 to 2030.  
The operational winter selection item changed from 3 to 2.  
The operational summer temperature changed from 90 to 75.  
The operational summer selection item changed from 8 to 5.  
The travel mode environment settings changed from both to: none

**EXPLANATION OF CHANGES MADE TO DEFAULT SETTINGS IN URBEMIS 2002**

**Project Number:** 10953-00

**Project Name:** City of Lake Forest Opportunities Study Program EIR - Landowner Concept Plan (Site 5)

The following pages include the printed results of the air pollutant emissions modeling for one of the land use components of the proposed project. The air emissions modeling was conducted using the URBEMIS 2002 for Windows computer program developed for the Yolo-Solano Air Quality Management District in May 2003. URBEMIS 2002 is programmed with EMFAC 2002 emission factors developed by the California Air Resources Board.

As part of this analysis, changes have been made to several of the default values programmed into URBEMIS 2002. These changes were made to more accurately reflect the nature of the proposed land use. Each of these changes are discussed below.

**Vehicle Trip Rates**

The default vehicle trip rate values were changed to be consistent with the traffic impact analysis prepared for the project.

**Vehicle Fleet Mix**

URBEMIS 2002 is programmed with the following state-wide average vehicle fleet mix:

State-Wide Vehicle Type	Total	
Automobiles	52.5%	
Light-Duty Trucks <3,750 pounds	15.9%	
Light-Duty Trucks 3,751-5,750 pounds	16.7%	
Medium-Duty Trucks 5,751-8,500 pounds	7.6%	} 10.50% Total Trucks
Light-Heavy-Duty Trucks 8,501-10,000 pounds	1.0%	
Light-Heavy-Duty Trucks 10,001-14,000 pounds	0.3%	
Medium-Heavy-Duty Trucks 14,001-33,000 pounds	0.9%	
Heavy-Heavy-Duty Trucks 33,001-60,000 pounds	0.7%	
Line-Haul Vehicles	0.0%	
Urban Buses	0.2%	
Motorcycles	1.5%	
School Buses	0.1%	
Motor Homes	2.6%	

However, this state-wide average fleet mix is not appropriate for the majority of land use analyses. The project land use assessed in this analysis is identified below along with the total percentage of trucks (medium and heavy) that are expected for this land use. The following vehicle mix was calculated based on the percentage of trucks associated with this land use. The percentage of trucks for each land use were determined from the 3rd, 4th, 5th, and 6th Editions of the ITE Trip Generation manual.

ITE Code	Project Land Use:	Truck %	ADT	Truck #
210	Single Family	0.44%	517	2
230	Residential Condo	0.88%	375	3
220	Apartment	0.88%	0	0
150	Warehousing	27.00%	0	0
760	Research Center	1.84%	0	0
410	Park	0.44%	0	0
170	Utilities	30.00%	0	0
770	Business Park	1.84%	0	0
151	Mini Warehouse	7.00%	0	0
110	General Light Industry	8.00%	0	0
815	Discount Store	2.10%	0	0
0			0	0
Project Totals:			892	6
Project Truck %:			0.62%	

Vehicle Type	Total	
Automobiles	58.29%	
Light-Duty Trucks <3,750 pounds	17.65%	
Light-Duty Trucks 3,751-5,750 pounds	18.54%	
Medium-Duty Trucks 5,751-8,500 pounds	0.45%	} 0.62% Total Trucks
Light-Heavy-Duty Trucks 8,501-10,000 pounds	0.06%	
Light-Heavy-Duty Trucks 10,001-14,000 pounds	0.02%	
Medium-Heavy-Duty Trucks 14,001-33,000 pounds	0.05%	
Heavy-Heavy-Duty Trucks 33,001-60,000 pounds	0.04%	
Line-Haul Vehicles	0.00%	
Urban Buses	0.22%	
Motorcycles	1.67%	
School Buses	0.11%	
Motor Homes	2.89%	

URBEMIS 2002 For Windows 7.5.0

File Name: P:\Projects - All Users\10800-00+\10953-00 Lake Forest Opportunities Study EIR\EIR\A  
Project Name: City of Lake Forest EIR - Landowner Concept Plan Operational Emissions (Site 6)  
Project Location: South Coast Air Basin (Los Angeles area)  
On-Road Motor Vehicle Emissions Based on EMFAC2002 version 2.2

SUMMARY REPORT  
(Pounds/Day - Summer)

AREA SOURCE EMISSION ESTIMATES

	ROG	NOx	CO	SO2	PM10
TOTALS (lbs/day,unmitigated)	4.36	1.08	1.49	0.03	0.00

OPERATIONAL (VEHICLE) EMISSION ESTIMATES

	ROG	NOx	CO	SO2	PM10
TOTALS (lbs/day,unmitigated)	1.57	1.47	16.16	0.05	9.00

SUM OF AREA AND OPERATIONAL EMISSION ESTIMATES

	ROG	NOx	CO	SO2	PM10
TOTALS (lbs/day,unmitigated)	5.93	2.54	17.65	0.08	9.00

URBEMIS 2002 For Windows 7.5.0

File Name: P:\Projects - All Users\10800-00+\10953-00 Lake Forest Opportunities Study EIR\EIR\A  
Project Name: City of Lake Forest EIR - Landowner Concept Plan Operational Emissions (Site 6)  
Project Location: South Coast Air Basin (Los Angeles area)  
On-Road Motor Vehicle Emissions Based on EMFAC2002 version 2.2

SUMMARY REPORT  
(Pounds/Day - Winter)

AREA SOURCE EMISSION ESTIMATES

	ROG	NOx	CO	SO2	PM10
TOTALS (lbs/day,unmitigated)	4.24	1.07	0.45	0.00	0.00

OPERATIONAL (VEHICLE) EMISSION ESTIMATES

	ROG	NOx	CO	SO2	PM10
TOTALS (lbs/day,unmitigated)	1.66	1.91	17.80	0.04	9.00

SUM OF AREA AND OPERATIONAL EMISSION ESTIMATES

	ROG	NOx	CO	SO2	PM10
TOTALS (lbs/day,unmitigated)	5.90	2.97	18.25	0.04	9.00

URBEMIS 2002 For Windows 7.5.0

File Name: P:\Projects - All Users\10800-00+\10953-00 Lake Forest Opportunities Study EIR\EIR\A  
Project Name: City of Lake Forest EIR - Landowner Concept Plan Operational Emissions (Site 6)  
Project Location: South Coast Air Basin (Los Angeles area)  
On-Road Motor Vehicle Emissions Based on EMFAC2002 version 2.2

SUMMARY REPORT  
(Tons/Year)

AREA SOURCE EMISSION ESTIMATES

	ROG	NOx	CO	SO2	PM10
TOTALS (tpy, unmitigated)	0.78	0.20	0.18	0.00	0.00

OPERATIONAL (VEHICLE) EMISSION ESTIMATES

	ROG	NOx	CO	SO2	PM10
TOTALS (tpy, unmitigated)	0.29	0.29	3.05	0.01	1.64

SUM OF AREA AND OPERATIONAL EMISSION ESTIMATES

	ROG	NOx	CO	SO2	PM10
TOTALS (tpy, unmitigated)	1.08	0.49	3.22	0.01	1.64

URBEMIS 2002 For Windows 7.5.0

File Name: P:\Projects - All Users\10800-00+\10953-00 Lake Forest Opportunities Study EIR\EIR\A  
Project Name: City of Lake Forest EIR - Landowner Concept Plan Operational Emissions (Site 6)  
Project Location: South Coast Air Basin (Los Angeles area)  
On-Road Motor Vehicle Emissions Based on EMFAC2002 version 2.2

DETAIL REPORT  
(Pounds/Day - Winter)

AREA SOURCE EMISSION ESTIMATES (Winter Pounds per Day, Unmitigated)					
Source	ROG	NOx	CO	SO2	PM10
Natural Gas	0.08	1.07	0.45	-	0.00
Wood Stoves	0.00	0.00	0.00	0.00	0.00
Fireplaces	0.00	0.00	0.00	0.00	0.00
Landscaping - No winter emissions					
Consumer Prdcts	4.16	-	-	-	-
TOTALS (lbs/day, unmitigated)	4.24	1.07	0.45	0.00	0.00

UNMITIGATED OPERATIONAL EMISSIONS

	ROG	NOx	CO	SO2	PM10
Single family housing	1.66	1.91	17.80	0.04	9.00
TOTAL EMISSIONS (lbs/day)	1.66	1.91	17.80	0.04	9.00

Does not include correction for passby trips.  
 Does not include double counting adjustment for internal trips.

OPERATIONAL (Vehicle) EMISSION ESTIMATES

Analysis Year: 2030 Temperature (F): 50 Season: Winter

EMFAC Version: EMFAC2002 (9/2002)

Summary of Land Uses:

Unit Type	Trip Rate	Size	Total Trips
Single family housing	10.50 trips / dwelling units	85.00	892.50

Vehicle Assumptions:

Fleet Mix:

Vehicle Type	Percent Type	Non-Catalyst	Catalyst	Diesel
Light Auto	58.40	0.00	100.00	0.00
Light Truck < 3,750 lbs	17.69	0.00	100.00	0.00
Light Truck 3,751- 5,750	18.58	0.00	100.00	0.00
Med Truck 5,751- 8,500	0.32	0.00	100.00	0.00
Lite-Heavy 8,501-10,000	0.04	0.00	80.00	20.00
Lite-Heavy 10,001-14,000	0.01	0.00	66.70	33.30
Med-Heavy 14,001-33,000	0.04	0.00	22.20	77.80
Heavy-Heavy 33,001-60,000	0.03	0.00	0.00	100.00
Line Haul > 60,000 lbs	0.00	0.00	0.00	100.00
Urban Bus	0.22	0.00	50.00	50.00
Motorcycle	1.67	33.30	66.70	0.00
School Bus	0.11	0.00	0.00	100.00
Motor Home	2.89	0.00	92.30	7.70

Travel Conditions

	Residential			Commercial		
	Home-Work	Home-Shop	Home-Other	Commute	Non-Work	Customer
Urban Trip Length (miles)	11.5	4.9	6.0	10.3	5.5	5.5
Rural Trip Length (miles)	11.5	4.9	6.0	10.3	5.5	5.5
Trip Speeds (mph)	35.0	40.0	40.0	40.0	40.0	40.0
% of Trips - Residential	20.0	37.0	43.0			

Changes made to the default values for Land Use Trip Percentages

Changes made to the default values for Area

The wood stove option switch changed from on to off.  
The fireplcase option switch changed from on to off.

Changes made to the default values for Operations

The light auto percentage changed from 52.5 to 58.4.  
The light truck < 3750 lbs percentage changed from 15.9 to 17.69.  
The light truck 3751-5750 percentage changed from 16.7 to 18.58.  
The med truck 5751-8500 percentage changed from 7.6 to 0.32.  
The lite-heavy truck 8501-10000 percentage changed from 1.0 to 0.04.  
The lite-heavy truck 10001-14000 percentage changed from 0.3 to 0.01.  
The med-heavy truck 14001-33000 percentage changed from 0.9 to 0.04.  
The heavy-heavy truck 33001-60000 percentage changed from 0.7 to 0.03.  
The urban bus percentage changed from 0.2 to 0.22.  
The motorcycle percentage changed from 1.5 to 1.67.  
The school bus percentage changed from 0.1 to 0.11.  
The motorhome percentage changed from 2.6 to 2.89.  
The operational emission year changed from 2004 to 2030.  
The operational winter selection item changed from 3 to 2.  
The operational summer temperature changed from 90 to 75.  
The operational summer selection item changed from 8 to 5.  
The travel mode environment settings changed from both to: none

URBEMIS 2002 For Windows 7.5.0

File Name: P:\Projects - All Users\10800-00+\10953-00 Lake Forest Opportunities Study EIR\EIR\A  
Project Name: City of Lake Forest EIR - Landowner Concept Plan Operational Emissions (Site 6)  
Project Location: South Coast Air Basin (Los Angeles area)  
On-Road Motor Vehicle Emissions Based on EMFAC2002 version 2.2

DETAIL REPORT  
(Pounds/Day - Summer)

AREA SOURCE EMISSION ESTIMATES (Summer Pounds per Day, Unmitigated)					
Source	ROG	NOx	CO	SO2	PM10
Natural Gas	0.08	1.07	0.45	-	0.00
Wood Stoves - No summer emissions					
Fireplaces - No summer emissions					
Landscaping	0.12	0.01	1.04	0.03	0.00
Consumer Prdcts	4.16	-	-	-	-
TOTALS (lbs/day, unmitigated)	4.36	1.08	1.49	0.03	0.00

UNMITIGATED OPERATIONAL EMISSIONS

	ROG	NOx	CO	SO2	PM10
Single family housing	1.57	1.47	16.16	0.05	9.00
TOTAL EMISSIONS (lbs/day)	1.57	1.47	16.16	0.05	9.00

Does not include correction for passby trips.  
 Does not include double counting adjustment for internal trips.

OPERATIONAL (Vehicle) EMISSION ESTIMATES

Analysis Year: 2030 Temperature (F): 75 Season: Summer

EMFAC Version: EMFAC2002 (9/2002)

Summary of Land Uses:

Unit Type	Trip Rate	Size	Total Trips
Single family housing	10.50 trips / dwelling units	85.00	892.50

Vehicle Assumptions:

Fleet Mix:

Vehicle Type	Percent Type	Non-Catalyst	Catalyst	Diesel
Light Auto	58.40	0.00	100.00	0.00
Light Truck < 3,750 lbs	17.69	0.00	100.00	0.00
Light Truck 3,751- 5,750	18.58	0.00	100.00	0.00
Med Truck 5,751- 8,500	0.32	0.00	100.00	0.00
Lite-Heavy 8,501-10,000	0.04	0.00	80.00	20.00
Lite-Heavy 10,001-14,000	0.01	0.00	66.70	33.30
Med-Heavy 14,001-33,000	0.04	0.00	22.20	77.80
Heavy-Heavy 33,001-60,000	0.03	0.00	0.00	100.00
Line Haul > 60,000 lbs	0.00	0.00	0.00	100.00
Urban Bus	0.22	0.00	50.00	50.00
Motorcycle	1.67	33.30	66.70	0.00
School Bus	0.11	0.00	0.00	100.00
Motor Home	2.89	0.00	92.30	7.70

Travel Conditions

	Residential			Commercial		
	Home-Work	Home-Shop	Home-Other	Commute	Non-Work	Customer
Urban Trip Length (miles)	11.5	4.9	6.0	10.3	5.5	5.5
Rural Trip Length (miles)	11.5	4.9	6.0	10.3	5.5	5.5
Trip Speeds (mph)	35.0	40.0	40.0	40.0	40.0	40.0
% of Trips - Residential	20.0	37.0	43.0			

Changes made to the default values for Land Use Trip Percentages

Changes made to the default values for Area

The wood stove option switch changed from on to off.  
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The heavy-heavy truck 33001-60000 percentage changed from 0.7 to 0.03.  
The urban bus percentage changed from 0.2 to 0.22.  
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The school bus percentage changed from 0.1 to 0.11.  
The motorhome percentage changed from 2.6 to 2.89.  
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The operational winter selection item changed from 3 to 2.  
The operational summer temperature changed from 90 to 75.  
The operational summer selection item changed from 8 to 5.  
The travel mode environment settings changed from both to: none

URBEMIS 2002 For Windows 7.5.0

File Name: P:\Projects - All Users\10800-00+\10953-00 Lake Forest Opportunities Study EIR\EIR\A  
Project Name: City of Lake Forest EIR - Landowner Concept Plan Operational Emissions (Site 6)  
Project Location: South Coast Air Basin (Los Angeles area)  
On-Road Motor Vehicle Emissions Based on EMFAC2002 version 2.2

DETAIL REPORT  
(Tons/Year)

AREA SOURCE EMISSION ESTIMATES

Source	ROG	NOx	CO	SO2	PM10
Natural Gas	0.02	0.19	0.08	-	0.00
Wood Stoves	0.00	0.00	0.00	0.00	0.00
Fireplaces	0.00	0.00	0.00	0.00	0.00
Landscaping	0.01	0.00	0.09	0.00	0.00
Consumer Prdcts	0.76	-	-	-	-
TOTALS (tpy, unmitigated)	0.78	0.20	0.18	0.00	0.00

UNMITIGATED OPERATIONAL EMISSIONS

	ROG	NOx	CO	SO2	PM10
Single family housing	0.29	0.29	3.05	0.01	1.64
TOTAL EMISSIONS (tons/yr)	0.29	0.29	3.05	0.01	1.64

Does not include correction for passby trips.  
 Does not include double counting adjustment for internal trips.

OPERATIONAL (Vehicle) EMISSION ESTIMATES

Analysis Year: 2030 Temperature (F): 75 Season: Annual

EMFAC Version: EMFAC2002 (9/2002)

Summary of Land Uses:

Unit Type	Trip Rate	Size	Total Trips
Single family housing	10.50 trips / dwelling units	85.00	892.50

Vehicle Assumptions:

Fleet Mix:

Vehicle Type	Percent Type	Non-Catalyst	Catalyst	Diesel
Light Auto	58.40	0.00	100.00	0.00
Light Truck < 3,750 lbs	17.69	0.00	100.00	0.00
Light Truck 3,751- 5,750	18.58	0.00	100.00	0.00
Med Truck 5,751- 8,500	0.32	0.00	100.00	0.00
Lite-Heavy 8,501-10,000	0.04	0.00	80.00	20.00
Lite-Heavy 10,001-14,000	0.01	0.00	66.70	33.30
Med-Heavy 14,001-33,000	0.04	0.00	22.20	77.80
Heavy-Heavy 33,001-60,000	0.03	0.00	0.00	100.00
Line Haul > 60,000 lbs	0.00	0.00	0.00	100.00
Urban Bus	0.22	0.00	50.00	50.00
Motorcycle	1.67	33.30	66.70	0.00
School Bus	0.11	0.00	0.00	100.00
Motor Home	2.89	0.00	92.30	7.70

Travel Conditions

	Residential			Commercial		
	Home-Work	Home-Shop	Home-Other	Commute	Non-Work	Customer
Urban Trip Length (miles)	11.5	4.9	6.0	10.3	5.5	5.5
Rural Trip Length (miles)	11.5	4.9	6.0	10.3	5.5	5.5
Trip Speeds (mph)	35.0	40.0	40.0	40.0	40.0	40.0
% of Trips - Residential	20.0	37.0	43.0			

Changes made to the default values for Land Use Trip Percentages

Changes made to the default values for Area

The wood stove option switch changed from on to off.  
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The motorhome percentage changed from 2.6 to 2.89.  
The operational emission year changed from 2004 to 2030.  
The operational winter selection item changed from 3 to 2.  
The operational summer temperature changed from 90 to 75.  
The operational summer selection item changed from 8 to 5.  
The travel mode environment settings changed from both to: none

**EXPLANATION OF CHANGES MADE TO DEFAULT SETTINGS IN URBEMIS 2002**

**Project Number:** 10953-00

**Project Name:** City of Lake Forest Opportunities Study Program EIR - Landowner Concept Plan (Site 6)

The following pages include the printed results of the air pollutant emissions modeling for one of the land use components of the proposed project. The air emissions modeling was conducted using the URBEMIS 2002 for Windows computer program developed for the Yolo-Solano Air Quality Management District in May 2003. URBEMIS 2002 is programmed with EMFAC 2002 emission factors developed by the California Air Resources Board.

As part of this analysis, changes have been made to several of the default values programmed into URBEMIS 2002. These changes were made to more accurately reflect the nature of the proposed land use. Each of these changes are discussed below.

**Vehicle Trip Rates**

The default vehicle trip rate values were changed to be consistent with the traffic impact analysis prepared for the project.

**Vehicle Fleet Mix**

URBEMIS 2002 is programmed with the following state-wide average vehicle fleet mix:

State-Wide Vehicle Type	Total	
Automobiles	52.5%	
Light-Duty Trucks <3,750 pounds	15.9%	
Light-Duty Trucks 3,751-5,750 pounds	16.7%	
Medium-Duty Trucks 5,751-8,500 pounds	7.6%	} 10.50% Total Trucks
Light-Heavy-Duty Trucks 8,501-10,000 pounds	1.0%	
Light-Heavy-Duty Trucks 10,001-14,000 pounds	0.3%	
Medium-Heavy-Duty Trucks 14,001-33,000 pounds	0.9%	
Heavy-Heavy-Duty Trucks 33,001-60,000 pounds	0.7%	
Line-Haul Vehicles	0.0%	
Urban Buses	0.2%	
Motorcycles	1.5%	
School Buses	0.1%	
Motor Homes	2.6%	

However, this state-wide average fleet mix is not appropriate for the majority of land use analyses. The project land use assessed in this analysis is identified below along with the total percentage of trucks (medium and heavy) that are expected for this land use. The following vehicle mix was calculated based on the percentage of trucks associated with this land use. The percentage of trucks for each land use were determined from the 3rd, 4th, 5th, and 6th Editions of the ITE Trip Generation manual.

ITE Code	Project Land Use:	Truck %	ADT	Truck #
210	Single Family	0.44%	813	4
230	Residential Condo	0.88%	0	0
220	Apartment	0.88%	0	0
150	Warehousing	27.00%	0	0
760	Research Center	1.84%	0	0
410	Park	0.44%	0	0
170	Utilities	30.00%	0	0
770	Business Park	1.84%	0	0
151	Mini Warehouse	7.00%	0	0
110	General Light Industry	8.00%	0	0
815	Discount Store	2.10%	0	0
0			0	0
Project Totals:			813	4
Project Truck %:			0.44%	

Vehicle Type	Total	
Automobiles	58.40%	
Light-Duty Trucks <3,750 pounds	17.69%	
Light-Duty Trucks 3,751-5,750 pounds	18.58%	
Medium-Duty Trucks 5,751-8,500 pounds	0.32%	} 0.44% Total Trucks
Light-Heavy-Duty Trucks 8,501-10,000 pounds	0.04%	
Light-Heavy-Duty Trucks 10,001-14,000 pounds	0.01%	
Medium-Heavy-Duty Trucks 14,001-33,000 pounds	0.04%	
Heavy-Heavy-Duty Trucks 33,001-60,000 pounds	0.03%	
Line-Haul Vehicles	0.00%	
Urban Buses	0.22%	
Motorcycles	1.67%	
School Buses	0.11%	
Motor Homes	2.89%	

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**CO Analysis in Project Area—Existing Traffic Volumes**

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# SIMPLIFIED CALINE4 CARBON MONOXIDE ANALYSIS

Project Number: 10953-00  
 Project Title: City of Lake Forest Opportunities Study Program EIR

## Background Information

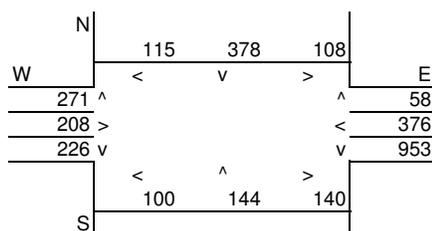
Nearest Air Monitoring Station measuring CO: Mission Viejo - 26081 Via Pera  
 Background 1-hour CO Concentration (ppm): 3.0  
 Background 8-hour CO Concentration (ppm): 1.5  
 Persistence Factor: 0.7  
 Analysis Year: 2004

## Roadway Data

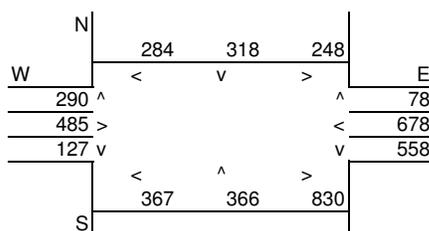
Intersection: Bake & Portola  
 Analysis Condition: Existing Traffic Volumes

	Roadway Type	No. of Lanes	Average Speed		
			A.M.	P.M.	
North-South Roadway:	Bake	At Grade	8	20	20
East-West Roadway:	Portola	At Grade	8	20	20

### A.M. Peak Hour Traffic Volumes



### P.M. Peak Hour Traffic Volumes



### Highest Traffic Volumes (Vehicles per Hour)

N-S Road:	1,941	N-S Road:	2,566
E-W Road:	1,843	E-W Road:	2,877

## Roadway CO Contributions and Concentrations

$$\text{Emissions} = (A \times B \times C) / 100,000^1$$

Roadway	A <sub>1</sub>	A <sub>2</sub>	A <sub>3</sub>	B	C	Estimated CO Concentrations		
	Reference CO Concentrations 25 Feet	50 Feet	100 Feet	Traffic Volume	Emission Factors <sup>2</sup>	25 Feet	50 Feet	100 Feet
<b>A.M. Peak Traffic Hour</b>								
North-South Road	5.7	4.6	3.4	1,941	7.65	0.85	0.68	0.51
East-West Road	2.2	1.9	1.6	1,843	7.65	0.31	0.27	0.23
<b>P.M. Peak Traffic Hour</b>								
North-South Road	2.2	1.9	1.6	2,566	7.65	0.43	0.37	0.31
East-West Road	5.7	4.6	3.4	2,877	7.65	1.26	1.01	0.75

<sup>1</sup> Methodology from Bay Area Air Quality Management District *BAAQMD CEQA Guidelines* (1996).

<sup>2</sup> Emission factors from EMFAC2002 (2003).

## Total Roadway CO Concentrations

$$\text{Peak Hour Emissions} = \text{North-South Concentration} + \text{East-West Concentration} + \text{Background 1-hour Concentration}^2$$

$$\text{8-Hour Emissions} = ((\text{Highest Peak Hour Concentration} - \text{Background 1-hour Concentration}) \times \text{Persistence Factor}) + \text{Background 8-hour Concentration}$$

	A.M. Peak Hour	P.M. Peak Hour	8-Hour
25 Feet from Roadway Edge	4.2	4.7	2.7
50 Feet from Roadway Edge	4.0	4.4	2.5
100 Feet from Roadway Edge	3.7	4.1	2.2

<sup>2</sup> Methodology from Bay Area Air Quality Management District *BAAQMD CEQA Guidelines* (1996).

# SIMPLIFIED CALINE4 CARBON MONOXIDE ANALYSIS

**Project Number:** 10953-00  
**Project Title:** City of Lake Forest Opportunities Study Program EIR

## Background Information

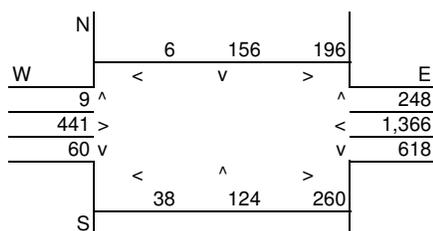
Nearest Air Monitoring Station measuring CO: Mission Viejo - 26081 Via Pera  
 Background 1-hour CO Concentration (ppm): 3.0  
 Background 8-hour CO Concentration (ppm): 1.5  
 Persistence Factor: 0.7  
 Analysis Year: 2004

## Roadway Data

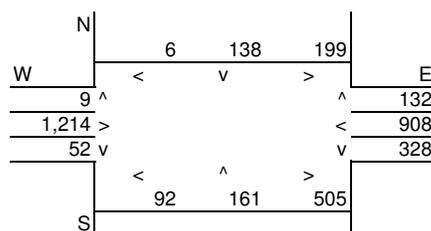
Intersection: Lake Forest & Portola  
 Analysis Condition: Existing Traffic Volumes

	Roadway Type	No. of Lanes	Average Speed		
			A.M.	P.M.	
North-South Roadway:	Lake Forest	At Grade	8	20	20
East-West Roadway:	Portola	At Grade	8	20	20

### A.M. Peak Hour Traffic Volumes



### P.M. Peak Hour Traffic Volumes



### Highest Traffic Volumes (Vehicles per Hour)

N-S Road: 1,256                      N-S Road: 1,276  
 E-W Road: 3,129                     E-W Road: 3,286

## Roadway CO Contributions and Concentrations

Emissions = (A x B x C) / 100,000<sup>1</sup>

Roadway	A <sub>1</sub>	A <sub>2</sub>	A <sub>3</sub>	B	C	Estimated CO Concentrations		
	Reference CO Concentrations 25 Feet	50 Feet	100 Feet	Traffic Volume	Emission Factors <sup>2</sup>	25 Feet	50 Feet	100 Feet
<b>A.M. Peak Traffic Hour</b>								
North-South Road	2.2	1.9	1.6	1,256	7.65	0.21	0.18	0.15
East-West Road	5.7	4.6	3.4	3,129	7.65	1.36	1.10	0.81
<b>P.M. Peak Traffic Hour</b>								
North-South Road	2.2	1.9	1.6	1,276	7.65	0.21	0.19	0.16
East-West Road	5.7	4.6	3.4	3,286	7.65	1.43	1.16	0.86

<sup>1</sup> Methodology from Bay Area Air Quality Management District *BAAQMD CEQA Guidelines* (1996).

<sup>2</sup> Emission factors from EMFAC2002 (2003).

## Total Roadway CO Concentrations

Peak Hour Emissions = North-South Concentration + East-West Concentration + Background 1-hour Concentration<sup>2</sup>

8-Hour Emissions = ((Highest Peak Hour Concentration - Background 1-hour Concentration) x Persistence Factor) + Background 8-hour Concentration

	A.M. Peak Hour	P.M. Peak Hour	8-Hour
25 Feet from Roadway Edge	4.6	4.6	2.6
50 Feet from Roadway Edge	4.3	4.3	2.4
100 Feet from Roadway Edge	4.0	4.0	2.2

<sup>2</sup> Methodology from Bay Area Air Quality Management District *BAAQMD CEQA Guidelines* (1996).

# SIMPLIFIED CALINE4 CARBON MONOXIDE ANALYSIS

**Project Number:** 10953-00  
**Project Title:** City of Lake Forest Opportunities Study Program EIR

## Background Information

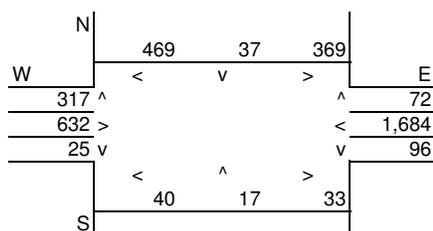
Nearest Air Monitoring Station measuring CO: Mission Viejo - 26081 Via Pera  
 Background 1-hour CO Concentration (ppm): 3.0  
 Background 8-hour CO Concentration (ppm): 1.5  
 Persistence Factor: 0.7  
 Analysis Year: 2004

## Roadway Data

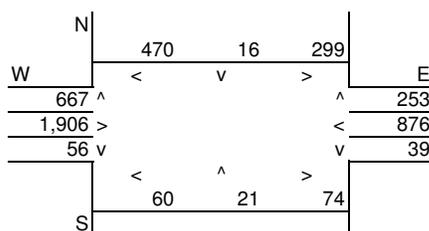
Intersection: Glenn Ranch & Portola  
 Analysis Condition: Existing Traffic Volumes

	Roadway Type	No. of Lanes	Average Speed		
			A.M.	P.M.	
North-South Roadway:	Glenn Ranch	At Grade	8	20	20
East-West Roadway:	Portola	At Grade	8	20	20

### A.M. Peak Hour Traffic Volumes



### P.M. Peak Hour Traffic Volumes



### Highest Traffic Volumes (Vehicles per Hour)

N-S Road: 1,281  
 E-W Road: 3,167

N-S Road: 1,726  
 E-W Road: 4,035

## Roadway CO Contributions and Concentrations

$$\text{Emissions} = (A \times B \times C) / 100,000^1$$

Roadway	A <sub>1</sub>	A <sub>2</sub>	A <sub>3</sub>	B	C	Estimated CO Concentrations		
	Reference CO Concentrations 25 Feet	50 Feet	100 Feet	Traffic Volume	Emission Factors <sup>2</sup>	25 Feet	50 Feet	100 Feet
<b>A.M. Peak Traffic Hour</b>								
North-South Road	2.2	1.9	1.6	1,281	7.65	0.22	0.19	0.16
East-West Road	5.7	4.6	3.4	3,167	7.65	1.38	1.11	0.82
<b>P.M. Peak Traffic Hour</b>								
North-South Road	2.2	1.9	1.6	1,726	7.65	0.29	0.25	0.21
East-West Road	5.7	4.6	3.4	4,035	7.65	1.76	1.42	1.05

<sup>1</sup> Methodology from Bay Area Air Quality Management District *BAAQMD CEQA Guidelines* (1996).

<sup>2</sup> Emission factors from EMFAC2002 (2003).

## Total Roadway CO Concentrations

$$\text{Peak Hour Emissions} = \text{North-South Concentration} + \text{East-West Concentration} + \text{Background 1-hour Concentration}^2$$

$$\text{8-Hour Emissions} = ((\text{Highest Peak Hour Concentration} - \text{Background 1-hour Concentration}) \times \text{Persistence Factor}) + \text{Background 8-hour Concentration}$$

	A.M. Peak Hour	P.M. Peak Hour	8-Hour
25 Feet from Roadway Edge	4.6	5.1	2.9
50 Feet from Roadway Edge	4.3	4.7	2.7
100 Feet from Roadway Edge	4.0	4.3	2.4

<sup>2</sup> Methodology from Bay Area Air Quality Management District *BAAQMD CEQA Guidelines* (1996).

# SIMPLIFIED CALINE4 CARBON MONOXIDE ANALYSIS

Project Number: 10953-00  
 Project Title: City of Lake Forest Opportunities Study Program EIR

## Background Information

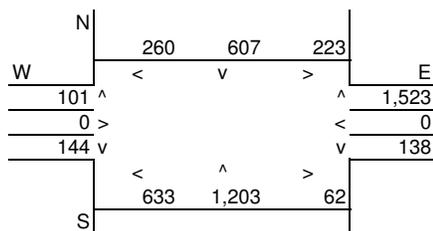
Nearest Air Monitoring Station measuring CO: Mission Viejo - 26081 Via Pera  
 Background 1-hour CO Concentration (ppm): 3.0  
 Background 8-hour CO Concentration (ppm): 1.5  
 Persistence Factor: 0.7  
 Analysis Year: 2004

## Roadway Data

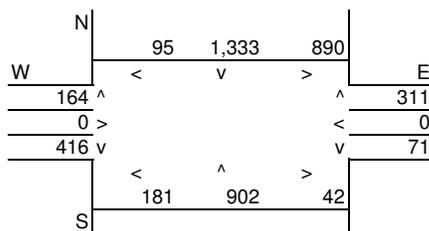
Intersection: Portola & SR-241 Ramps  
 Analysis Condition: Existing Traffic Volumes

	Roadway Type	No. of Lanes	Average Speed		
			A.M.	P.M.	
North-South Roadway:	Portola	At Grade	8	20	20
East-West Roadway:	SR-241 Ramps	At Grade	4	20	20

### A.M. Peak Hour Traffic Volumes



### P.M. Peak Hour Traffic Volumes



### Highest Traffic Volumes (Vehicles per Hour)

N-S Road: 3,917  
 E-W Road: 1,946

N-S Road: 3,695  
 E-W Road: 1,314

## Roadway CO Contributions and Concentrations

$$\text{Emissions} = (A \times B \times C) / 100,000^1$$

Roadway	A <sub>1</sub>	A <sub>2</sub>	A <sub>3</sub>	B	C	Estimated CO Concentrations		
	Reference CO Concentrations 25 Feet	50 Feet	100 Feet	Traffic Volume	Emission Factors <sup>2</sup>	25 Feet	50 Feet	100 Feet
<b>A.M. Peak Traffic Hour</b>								
North-South Road	5.7	4.6	3.4	3,917	7.65	1.71	1.38	1.02
East-West Road	2.6	2.2	1.7	1,946	7.65	0.39	0.33	0.25
<b>P.M. Peak Traffic Hour</b>								
North-South Road	5.7	4.6	3.4	3,695	7.65	1.61	1.30	0.96
East-West Road	2.6	2.2	1.7	1,314	7.65	0.26	0.22	0.17

<sup>1</sup> Methodology from Bay Area Air Quality Management District *BAAQMD CEQA Guidelines* (1996).

<sup>2</sup> Emission factors from EMFAC2002 (2003).

## Total Roadway CO Concentrations

$$\text{Peak Hour Emissions} = \text{North-South Concentration} + \text{East-West Concentration} + \text{Background 1-hour Concentration}^2$$

$$\text{8-Hour Emissions} = ((\text{Highest Peak Hour Concentration} - \text{Background 1-hour Concentration}) \times \text{Persistence Factor}) + \text{Background 8-hour Concentration}$$

	A.M. Peak Hour	P.M. Peak Hour	8-Hour
25 Feet from Roadway Edge	5.1	4.9	3.0
50 Feet from Roadway Edge	4.7	4.5	2.7
100 Feet from Roadway Edge	4.3	4.1	2.4

<sup>2</sup> Methodology from Bay Area Air Quality Management District *BAAQMD CEQA Guidelines* (1996).

# SIMPLIFIED CALINE4 CARBON MONOXIDE ANALYSIS

Project Number: 10953-00  
 Project Title: City of Lake Forest Opportunities Study Program EIR

## Background Information

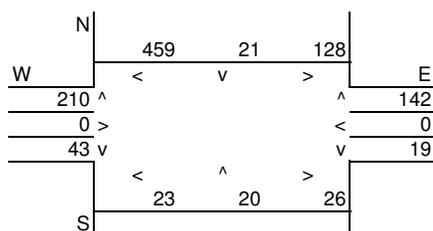
Nearest Air Monitoring Station measuring CO: Mission Viejo - 26081 Via Pera  
 Background 1-hour CO Concentration (ppm): 3.0  
 Background 8-hour CO Concentration (ppm): 1.5  
 Persistence Factor: 0.7  
 Analysis Year: 2004

## Roadway Data

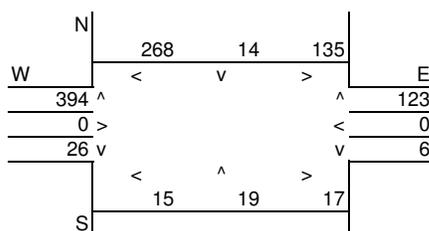
Intersection: Alton & SR-241 Ramps  
 Analysis Condition: Existing Traffic Volumes

	Roadway Type	No. of Lanes	Average Speed		
			A.M.	P.M.	
North-South Roadway:	Alton	At Grade	6	20	20
East-West Roadway:	SR-241 Ramps	At Grade	4	20	20

### A.M. Peak Hour Traffic Volumes



### P.M. Peak Hour Traffic Volumes



### Highest Traffic Volumes (Vehicles per Hour)

N-S Road:	980	N-S Road:	953
E-W Road:	735	E-W Road:	703

## Roadway CO Contributions and Concentrations

Emissions = (A x B x C) / 100,000<sup>1</sup>

Roadway	A <sub>1</sub>	A <sub>2</sub>	A <sub>3</sub>	B	C	Estimated CO Concentrations		
	Reference CO Concentrations 25 Feet	50 Feet	100 Feet	Traffic Volume	Emission Factors <sup>2</sup>	25 Feet	50 Feet	100 Feet
A.M. Peak Traffic Hour								
North-South Road	6.1	4.9	3.5	980	7.65	0.46	0.37	0.26
East-West Road	2.6	2.2	1.7	735	7.65	0.15	0.12	0.10
P.M. Peak Traffic Hour								
North-South Road	6.1	4.9	3.5	953	7.65	0.44	0.36	0.26
East-West Road	2.6	2.2	1.7	703	7.65	0.14	0.12	0.09

<sup>1</sup> Methodology from Bay Area Air Quality Management District *BAAQMD CEQA Guidelines* (1996).

<sup>2</sup> Emission factors from EMFAC2002 (2003).

## Total Roadway CO Concentrations

Peak Hour Emissions = North-South Concentration + East-West Concentration + Background 1-hour Concentration<sup>2</sup>

8-Hour Emissions = ((Highest Peak Hour Concentration - Background 1-hour Concentration) x Persistence Factor) + Background 8-hour Concentration

	A.M. Peak Hour	P.M. Peak Hour	8-Hour
25 Feet from Roadway Edge	3.6	3.6	1.9
50 Feet from Roadway Edge	3.5	3.5	1.8
100 Feet from Roadway Edge	3.4	3.3	1.7

<sup>2</sup> Methodology from Bay Area Air Quality Management District *BAAQMD CEQA Guidelines* (1996).

# SIMPLIFIED CALINE4 CARBON MONOXIDE ANALYSIS

Project Number: 10953-00  
 Project Title: City of Lake Forest Opportunities Study Program EIR

## Background Information

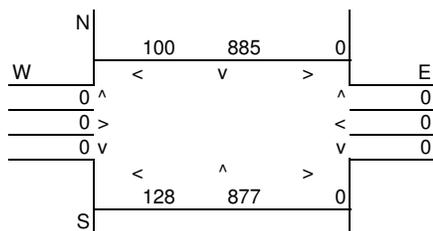
Nearest Air Monitoring Station measuring CO: Mission Viejo - 26081 Via Pera  
 Background 1-hour CO Concentration (ppm): 3.0  
 Background 8-hour CO Concentration (ppm): 1.5  
 Persistence Factor: 0.7  
 Analysis Year: 2004

## Roadway Data

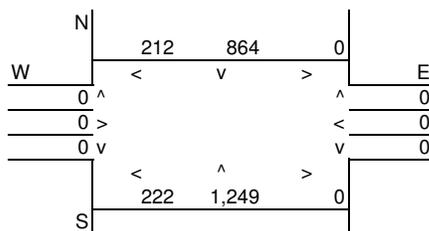
Intersection: Lake Forest & SR-241 NB  
 Analysis Condition: Existing Traffic Volumes

	Roadway Type	No. of Lanes	Average Speed		
			A.M.	P.M.	
North-South Roadway:	Lake Forest	At Grade	8	20	20
East-West Roadway:	SR-241 NB	At Grade	2	20	20

### A.M. Peak Hour Traffic Volumes



### P.M. Peak Hour Traffic Volumes



### Highest Traffic Volumes (Vehicles per Hour)

N-S Road:	1,890	N-S Road:	2,335
E-W Road:	228	E-W Road:	434

## Roadway CO Contributions and Concentrations

Emissions = (A x B x C) / 100,000<sup>1</sup>

Roadway	A <sub>1</sub>	A <sub>2</sub>	A <sub>3</sub>	B	C	Estimated CO Concentrations		
	Reference CO Concentrations 25 Feet	50 Feet	100 Feet	Traffic Volume	Emission Factors <sup>2</sup>	25 Feet	50 Feet	100 Feet
<b>A.M. Peak Traffic Hour</b>								
North-South Road	5.7	4.6	3.4	1,890	7.65	0.82	0.67	0.49
East-West Road	2.7	2.2	1.7	228	7.65	0.05	0.04	0.03
<b>P.M. Peak Traffic Hour</b>								
North-South Road	5.7	4.6	3.4	2,335	7.65	1.02	0.82	0.61
East-West Road	2.7	2.2	1.7	434	7.65	0.09	0.07	0.06

<sup>1</sup> Methodology from Bay Area Air Quality Management District *BAAQMD CEQA Guidelines* (1996).

<sup>2</sup> Emission factors from EMFAC2002 (2003).

## Total Roadway CO Concentrations

Peak Hour Emissions = North-South Concentration + East-West Concentration + Background 1-hour Concentration<sup>2</sup>

8-Hour Emissions = ((Highest Peak Hour Concentration - Background 1-hour Concentration) x Persistence Factor) + Background 8-hour Concentration

	A.M. Peak Hour	P.M. Peak Hour	8-Hour
25 Feet from Roadway Edge	3.9	4.1	2.3
50 Feet from Roadway Edge	3.7	3.9	2.1
100 Feet from Roadway Edge	3.5	3.7	2.0

<sup>2</sup> Methodology from Bay Area Air Quality Management District *BAAQMD CEQA Guidelines* (1996).

# SIMPLIFIED CALINE4 CARBON MONOXIDE ANALYSIS

Project Number: 10953-00  
 Project Title: City of Lake Forest Opportunities Study Program EIR

## Background Information

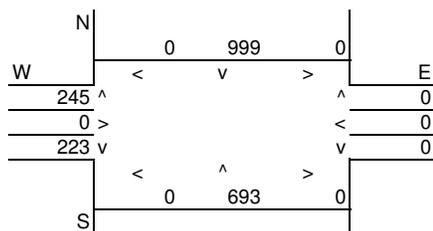
Nearest Air Monitoring Station measuring CO: Mission Viejo - 26081 Via Pera  
 Background 1-hour CO Concentration (ppm): 3.0  
 Background 8-hour CO Concentration (ppm): 1.5  
 Persistence Factor: 0.7  
 Analysis Year: 2004

## Roadway Data

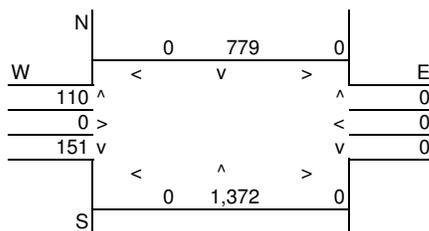
Intersection: Lake Forest & SR-241 SB  
 Analysis Condition: Existing Traffic Volumes

	Roadway Type	No. of Lanes	Average Speed		
			A.M.	P.M.	
North-South Roadway:	Lake Forest	At Grade	4	20	20
East-West Roadway:	SR-241 SB	At Grade	4	20	20

### A.M. Peak Hour Traffic Volumes



### P.M. Peak Hour Traffic Volumes



### Highest Traffic Volumes (Vehicles per Hour)

N-S Road:	1,937	N-S Road:	2,302
E-W Road:	468	E-W Road:	261

## Roadway CO Contributions and Concentrations

$$\text{Emissions} = (A \times B \times C) / 100,000^1$$

Roadway	A <sub>1</sub>	A <sub>2</sub>	A <sub>3</sub>	B	C	Estimated CO Concentrations		
	Reference CO Concentrations 25 Feet	50 Feet	100 Feet	Traffic Volume	Emission Factors <sup>2</sup>	25 Feet	50 Feet	100 Feet
<b>A.M. Peak Traffic Hour</b>								
North-South Road	7.0	5.4	3.8	1,937	7.65	1.04	0.80	0.56
East-West Road	2.6	2.2	1.7	468	7.65	0.09	0.08	0.06
<b>P.M. Peak Traffic Hour</b>								
North-South Road	7.0	5.4	3.8	2,302	7.65	1.23	0.95	0.67
East-West Road	2.6	2.2	1.7	261	7.65	0.05	0.04	0.03

<sup>1</sup> Methodology from Bay Area Air Quality Management District *BAAQMD CEQA Guidelines* (1996).

<sup>2</sup> Emission factors from EMFAC2002 (2003).

## Total Roadway CO Concentrations

$$\text{Peak Hour Emissions} = \text{North-South Concentration} + \text{East-West Concentration} + \text{Background 1-hour Concentration}^2$$

$$\text{8-Hour Emissions} = ((\text{Highest Peak Hour Concentration} - \text{Background 1-hour Concentration}) \times \text{Persistence Factor}) + \text{Background 8-hour Concentration}$$

	A.M. Peak Hour	P.M. Peak Hour	8-Hour
25 Feet from Roadway Edge	4.1	4.3	2.4
50 Feet from Roadway Edge	3.9	4.0	2.2
100 Feet from Roadway Edge	3.6	3.7	2.0

<sup>2</sup> Methodology from Bay Area Air Quality Management District *BAAQMD CEQA Guidelines* (1996).

# SIMPLIFIED CALINE4 CARBON MONOXIDE ANALYSIS

Project Number: 10953-00  
 Project Title: City of Lake Forest Opportunities Study Program EIR

## Background Information

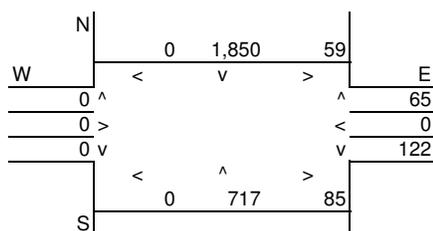
Nearest Air Monitoring Station measuring CO: Mission Viejo - 26081 Via Pera  
 Background 1-hour CO Concentration (ppm): 3.0  
 Background 8-hour CO Concentration (ppm): 1.5  
 Persistence Factor: 0.7  
 Analysis Year: 2004

## Roadway Data

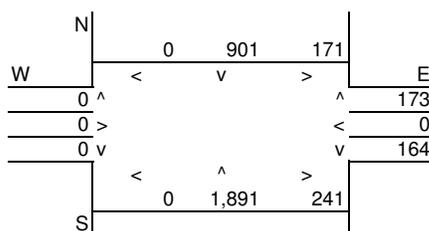
Intersection: Bake & Rancho North  
 Analysis Condition: Existing Traffic Volumes

	Roadway Type	No. of Lanes	Average Speed		
			A.M.	P.M.	
North-South Roadway:	Bake	At Grade	6	20	20
East-West Roadway:	Rancho North	At Grade	4	20	20

### A.M. Peak Hour Traffic Volumes



### P.M. Peak Hour Traffic Volumes



### Highest Traffic Volumes (Vehicles per Hour)

N-S Road:	2,774	N-S Road:	3,197
E-W Road:	331	E-W Road:	749

## Roadway CO Contributions and Concentrations

$$\text{Emissions} = (A \times B \times C) / 100,000^1$$

Roadway	A <sub>1</sub>	A <sub>2</sub>	A <sub>3</sub>	B	C	Estimated CO Concentrations		
	Reference CO Concentrations 25 Feet	50 Feet	100 Feet	Traffic Volume	Emission Factors <sup>2</sup>	25 Feet	50 Feet	100 Feet
<b>A.M. Peak Traffic Hour</b>								
North-South Road	6.1	4.9	3.5	2,774	7.65	1.29	1.04	0.74
East-West Road	2.6	2.2	1.7	331	7.65	0.07	0.06	0.04
<b>P.M. Peak Traffic Hour</b>								
North-South Road	6.1	4.9	3.5	3,197	7.65	1.49	1.20	0.86
East-West Road	2.6	2.2	1.7	749	7.65	0.15	0.13	0.10

<sup>1</sup> Methodology from Bay Area Air Quality Management District *BAAQMD CEQA Guidelines* (1996).

<sup>2</sup> Emission factors from EMFAC2002 (2003).

## Total Roadway CO Concentrations

$$\text{Peak Hour Emissions} = \text{North-South Concentration} + \text{East-West Concentration} + \text{Background 1-hour Concentration}^2$$

$$\text{8-Hour Emissions} = ((\text{Highest Peak Hour Concentration} - \text{Background 1-hour Concentration}) \times \text{Persistence Factor}) + \text{Background 8-hour Concentration}$$

	A.M. Peak Hour	P.M. Peak Hour	8-Hour
25 Feet from Roadway Edge	4.4	4.6	2.6
50 Feet from Roadway Edge	4.1	4.3	2.4
100 Feet from Roadway Edge	3.8	4.0	2.2

<sup>2</sup> Methodology from Bay Area Air Quality Management District *BAAQMD CEQA Guidelines* (1996).

# SIMPLIFIED CALINE4 CARBON MONOXIDE ANALYSIS

Project Number: 10953-00  
 Project Title: City of Lake Forest Opportunities Study Program EIR

## Background Information

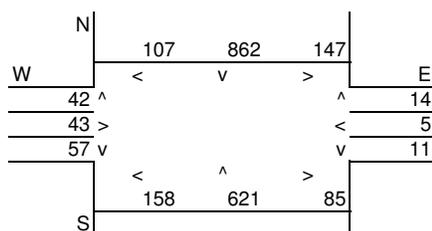
Nearest Air Monitoring Station measuring CO: Mission Viejo - 26081 Via Pera  
 Background 1-hour CO Concentration (ppm): 3.0  
 Background 8-hour CO Concentration (ppm): 1.5  
 Persistence Factor: 0.7  
 Analysis Year: 2004

## Roadway Data

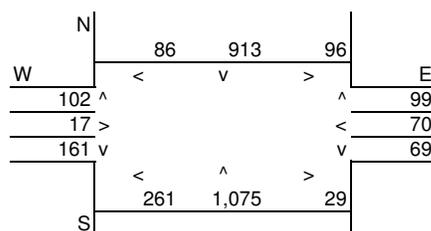
Intersection: Lake Forest & Rancho  
 Analysis Condition: Existing Traffic Volumes

	Roadway Type	No. of Lanes	Average Speed		
			A.M.	P.M.	
North-South Roadway:	Lake Forest	At Grade	8	20	20
East-West Roadway:	Rancho	At Grade	8	20	20

### A.M. Peak Hour Traffic Volumes



### P.M. Peak Hour Traffic Volumes



### Highest Traffic Volumes (Vehicles per Hour)

N-S Road: 1,794                      N-S Road: 2,508  
 E-W Road: 412                        E-W Road: 697

## Roadway CO Contributions and Concentrations

Emissions = (A x B x C) / 100,000<sup>1</sup>

Roadway	A <sub>1</sub>	A <sub>2</sub>	A <sub>3</sub>	B	C	Estimated CO Concentrations		
	Reference CO Concentrations 25 Feet	50 Feet	100 Feet	Traffic Volume	Emission Factors <sup>2</sup>	25 Feet	50 Feet	100 Feet
<b>A.M. Peak Traffic Hour</b>								
North-South Road	5.7	4.6	3.4	1,794	7.65	0.78	0.63	0.47
East-West Road	2.2	1.9	1.6	412	7.65	0.07	0.06	0.05
<b>P.M. Peak Traffic Hour</b>								
North-South Road	5.7	4.6	3.4	2,508	7.65	1.09	0.88	0.65
East-West Road	2.2	1.9	1.6	697	7.65	0.12	0.10	0.09

<sup>1</sup> Methodology from Bay Area Air Quality Management District *BAAQMD CEQA Guidelines* (1996).

<sup>2</sup> Emission factors from EMFAC2002 (2003).

## Total Roadway CO Concentrations

Peak Hour Emissions = North-South Concentration + East-West Concentration + Background 1-hour Concentration<sup>2</sup>

8-Hour Emissions = ((Highest Peak Hour Concentration - Background 1-hour Concentration) x Persistence Factor) + Background 8-hour Concentration

	A.M. Peak Hour	P.M. Peak Hour	8-Hour
25 Feet from Roadway Edge	3.9	4.2	2.3
50 Feet from Roadway Edge	3.7	4.0	2.2
100 Feet from Roadway Edge	3.5	3.7	2.0

<sup>2</sup> Methodology from Bay Area Air Quality Management District *BAAQMD CEQA Guidelines* (1996).

# SIMPLIFIED CALINE4 CARBON MONOXIDE ANALYSIS

Project Number: 10953-00  
 Project Title: City of Lake Forest Opportunities Study Program EIR

## Background Information

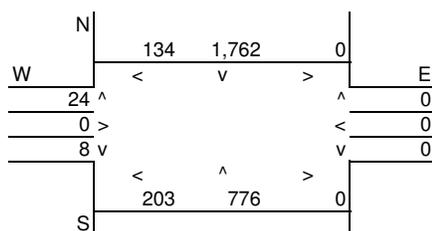
Nearest Air Monitoring Station measuring CO: Mission Viejo - 26081 Via Pera  
 Background 1-hour CO Concentration (ppm): 3.0  
 Background 8-hour CO Concentration (ppm): 1.5  
 Persistence Factor: 0.7  
 Analysis Year: 2004

## Roadway Data

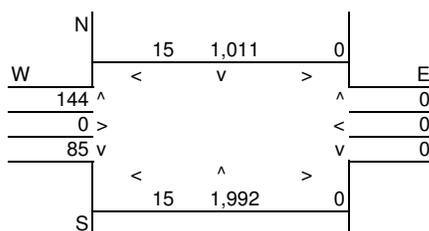
Intersection: Bake & Rancho South  
 Analysis Condition: Existing Traffic Volumes

	Roadway Type	No. of Lanes	Average Speed		
			A.M.	P.M.	
North-South Roadway:	Bake	At Grade	6	20	20
East-West Roadway:	Rancho South	At Grade	4	20	20

### A.M. Peak Hour Traffic Volumes



### P.M. Peak Hour Traffic Volumes



### Highest Traffic Volumes (Vehicles per Hour)

N-S Road: 2,749      N-S Road: 3,162  
 E-W Road: 369      E-W Road: 259

## Roadway CO Contributions and Concentrations

$$\text{Emissions} = (A \times B \times C) / 100,000^1$$

Roadway	A <sub>1</sub>	A <sub>2</sub>	A <sub>3</sub>	B	C	Estimated CO Concentrations		
	Reference CO Concentrations 25 Feet	50 Feet	100 Feet	Traffic Volume	Emission Factors <sup>2</sup>	25 Feet	50 Feet	100 Feet
<b>A.M. Peak Traffic Hour</b>								
North-South Road	6.1	4.9	3.5	2,749	7.65	1.28	1.03	0.74
East-West Road	2.6	2.2	1.7	369	7.65	0.07	0.06	0.05
<b>P.M. Peak Traffic Hour</b>								
North-South Road	6.1	4.9	3.5	3,162	7.65	1.48	1.19	0.85
East-West Road	2.6	2.2	1.7	259	7.65	0.05	0.04	0.03

<sup>1</sup> Methodology from Bay Area Air Quality Management District *BAAQMD CEQA Guidelines* (1996).

<sup>2</sup> Emission factors from EMFAC2002 (2003).

## Total Roadway CO Concentrations

$$\text{Peak Hour Emissions} = \text{North-South Concentration} + \text{East-West Concentration} + \text{Background 1-hour Concentration}^2$$

$$\text{8-Hour Emissions} = ((\text{Highest Peak Hour Concentration} - \text{Background 1-hour Concentration}) \times \text{Persistence Factor}) + \text{Background 8-hour Concentration}$$

	A.M. Peak Hour	P.M. Peak Hour	8-Hour
25 Feet from Roadway Edge	4.4	4.5	2.6
50 Feet from Roadway Edge	4.1	4.2	2.4
100 Feet from Roadway Edge	3.8	3.9	2.1

<sup>2</sup> Methodology from Bay Area Air Quality Management District *BAAQMD CEQA Guidelines* (1996).

# SIMPLIFIED CALINE4 CARBON MONOXIDE ANALYSIS

**Project Number:** 10953-00  
**Project Title:** City of Lake Forest Opportunities Study Program EIR

## Background Information

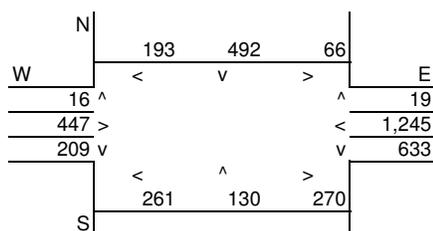
Nearest Air Monitoring Station measuring CO: Mission Viejo - 26081 Via Pera  
 Background 1-hour CO Concentration (ppm): 3.0  
 Background 8-hour CO Concentration (ppm): 1.5  
 Persistence Factor: 0.7  
 Analysis Year: 2004

## Roadway Data

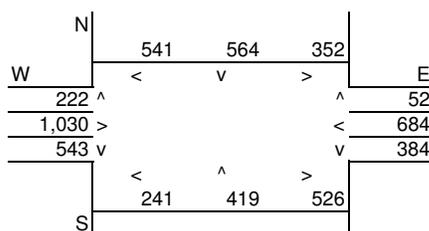
Intersection: El Toro & Portola/Santa Margarita  
 Analysis Condition: Existing Traffic Volumes

	Roadway Type	No. of Lanes	Average Speed		
			A.M.	P.M.	
North-South Roadway:	El Toro	At Grade	8	20	20
East-West Roadway:	Portola/Santa Margarita	At Grade	8	20	20

### A.M. Peak Hour Traffic Volumes



### P.M. Peak Hour Traffic Volumes



### Highest Traffic Volumes (Vehicles per Hour)

N-S Road: 1,995                      N-S Road: 2,677  
 E-W Road: 2,680                      E-W Road: 3,261

## Roadway CO Contributions and Concentrations

Emissions = (A x B x C) / 100,000<sup>1</sup>

Roadway	A <sub>1</sub>	A <sub>2</sub>	A <sub>3</sub>	B	C	Estimated CO Concentrations		
	Reference CO Concentrations 25 Feet	50 Feet	100 Feet	Traffic Volume	Emission Factors <sup>2</sup>	25 Feet	50 Feet	100 Feet
<b>A.M. Peak Traffic Hour</b>								
North-South Road	2.2	1.9	1.6	1,995	7.65	0.34	0.29	0.24
East-West Road	5.7	4.6	3.4	2,680	7.65	1.17	0.94	0.70
<b>P.M. Peak Traffic Hour</b>								
North-South Road	2.2	1.9	1.6	2,677	7.65	0.45	0.39	0.33
East-West Road	5.7	4.6	3.4	3,261	7.65	1.42	1.15	0.85

<sup>1</sup> Methodology from Bay Area Air Quality Management District *BAAQMD CEQA Guidelines* (1996).

<sup>2</sup> Emission factors from EMFAC2002 (2003).

## Total Roadway CO Concentrations

Peak Hour Emissions = North-South Concentration + East-West Concentration + Background 1-hour Concentration<sup>2</sup>

8-Hour Emissions = ((Highest Peak Hour Concentration - Background 1-hour Concentration) x Persistence Factor) + Background 8-hour Concentration

	A.M. Peak Hour	P.M. Peak Hour	8-Hour
25 Feet from Roadway Edge	4.5	4.9	2.8
50 Feet from Roadway Edge	4.2	4.5	2.6
100 Feet from Roadway Edge	3.9	4.2	2.3

<sup>2</sup> Methodology from Bay Area Air Quality Management District *BAAQMD CEQA Guidelines* (1996).

# SIMPLIFIED CALINE4 CARBON MONOXIDE ANALYSIS

Project Number: 10953-00  
 Project Title: City of Lake Forest Opportunities Study Program EIR

## Background Information

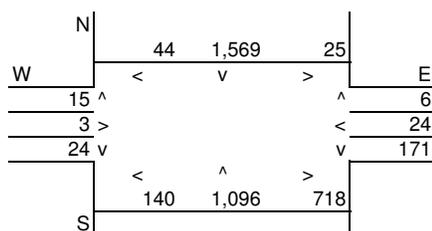
Nearest Air Monitoring Station measuring CO: Mission Viejo - 26081 Via Pera  
 Background 1-hour CO Concentration (ppm): 3.0  
 Background 8-hour CO Concentration (ppm): 1.5  
 Persistence Factor: 0.7  
 Analysis Year: 2004

## Roadway Data

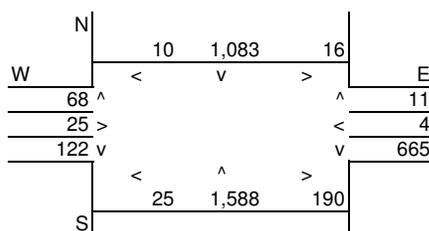
Intersection: Bake & Commercentre  
 Analysis Condition: Existing Traffic Volumes

	Roadway Type	No. of Lanes	Average Speed		
			A.M.	P.M.	
North-South Roadway:	Bake	At Grade	8	20	20
East-West Roadway:	Commercentre	At Grade	6	20	20

### A.M. Peak Hour Traffic Volumes



### P.M. Peak Hour Traffic Volumes



### Highest Traffic Volumes (Vehicles per Hour)

N-S Road:	3,718	N-S Road:	3,673
E-W Road:	947	E-W Road:	911

## Roadway CO Contributions and Concentrations

$$\text{Emissions} = (A \times B \times C) / 100,000^1$$

Roadway	A <sub>1</sub>	A <sub>2</sub>	A <sub>3</sub>	B	C	Estimated CO Concentrations		
	Reference CO Concentrations 25 Feet	50 Feet	100 Feet	Traffic Volume	Emission Factors <sup>2</sup>	25 Feet	50 Feet	100 Feet
<b>A.M. Peak Traffic Hour</b>								
North-South Road	5.7	4.6	3.4	3,718	7.65	1.62	1.31	0.97
East-West Road	2.3	2.0	1.7	947	7.65	0.17	0.14	0.12
<b>P.M. Peak Traffic Hour</b>								
North-South Road	5.7	4.6	3.4	3,673	7.65	1.60	1.29	0.96
East-West Road	2.3	2.0	1.7	911	7.65	0.16	0.14	0.12

<sup>1</sup> Methodology from Bay Area Air Quality Management District *BAAQMD CEQA Guidelines* (1996).

<sup>2</sup> Emission factors from EMFAC2002 (2003).

## Total Roadway CO Concentrations

$$\text{Peak Hour Emissions} = \text{North-South Concentration} + \text{East-West Concentration} + \text{Background 1-hour Concentration}^2$$

$$\text{8-Hour Emissions} = ((\text{Highest Peak Hour Concentration} - \text{Background 1-hour Concentration}) \times \text{Persistence Factor}) + \text{Background 8-hour Concentration}$$

	A.M. Peak Hour	P.M. Peak Hour	8-Hour
25 Feet from Roadway Edge	4.8	4.8	2.7
50 Feet from Roadway Edge	4.5	4.4	2.5
100 Feet from Roadway Edge	4.1	4.1	2.3

<sup>2</sup> Methodology from Bay Area Air Quality Management District *BAAQMD CEQA Guidelines* (1996).



# SIMPLIFIED CALINE4 CARBON MONOXIDE ANALYSIS

**Project Number:** 10953-00  
**Project Title:** City of Lake Forest Opportunities Study Program EIR

## Background Information

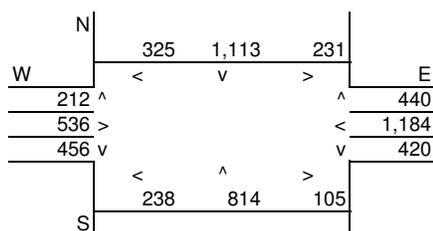
Nearest Air Monitoring Station measuring CO: Mission Viejo - 26081 Via Pera  
 Background 1-hour CO Concentration (ppm): 3.0  
 Background 8-hour CO Concentration (ppm): 1.5  
 Persistence Factor: 0.7  
 Analysis Year: 2004

## Roadway Data

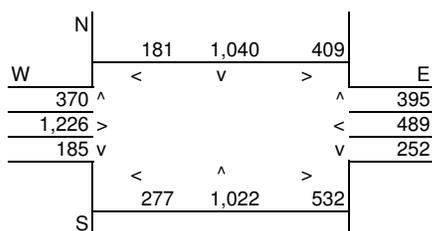
Intersection: Lake Forest & Trabuco  
 Analysis Condition: Existing Traffic Volumes

	Roadway Type	No. of Lanes	Average Speed		
			A.M.	P.M.	
North-South Roadway:	Lake Forest	At Grade	8	20	20
East-West Roadway:	Trabuco	At Grade	8	20	20

### A.M. Peak Hour Traffic Volumes



### P.M. Peak Hour Traffic Volumes



### Highest Traffic Volumes (Vehicles per Hour)

N-S Road: 3,146                      N-S Road: 3,417  
 E-W Road: 2,951                      E-W Road: 3,303

## Roadway CO Contributions and Concentrations

Emissions = (A x B x C) / 100,000<sup>1</sup>

Roadway	A <sub>1</sub>	A <sub>2</sub>	A <sub>3</sub>	B	C	Estimated CO Concentrations		
	Reference CO Concentrations 25 Feet	50 Feet	100 Feet	Traffic Volume	Emission Factors <sup>2</sup>	25 Feet	50 Feet	100 Feet
<b>A.M. Peak Traffic Hour</b>								
North-South Road	5.7	4.6	3.4	3,146	7.65	1.37	1.11	0.82
East-West Road	2.2	1.9	1.6	2,951	7.65	0.50	0.43	0.36
<b>P.M. Peak Traffic Hour</b>								
North-South Road	5.7	4.6	3.4	3,417	7.65	1.49	1.20	0.89
East-West Road	2.2	1.9	1.6	3,303	7.65	0.56	0.48	0.40

<sup>1</sup> Methodology from Bay Area Air Quality Management District *BAAQMD CEQA Guidelines* (1996).

<sup>2</sup> Emission factors from EMFAC2002 (2003).

## Total Roadway CO Concentrations

Peak Hour Emissions = North-South Concentration + East-West Concentration + Background 1-hour Concentration<sup>2</sup>

8-Hour Emissions = ((Highest Peak Hour Concentration - Background 1-hour Concentration) x Persistence Factor) + Background 8-hour Concentration

	A.M. Peak Hour	P.M. Peak Hour	8-Hour
25 Feet from Roadway Edge	4.9	5.0	2.9
50 Feet from Roadway Edge	4.5	4.7	2.7
100 Feet from Roadway Edge	4.2	4.3	2.4

<sup>2</sup> Methodology from Bay Area Air Quality Management District *BAAQMD CEQA Guidelines* (1996).

# SIMPLIFIED CALINE4 CARBON MONOXIDE ANALYSIS

Project Number: 10953-00  
 Project Title: City of Lake Forest Opportunities Study Program EIR

## Background Information

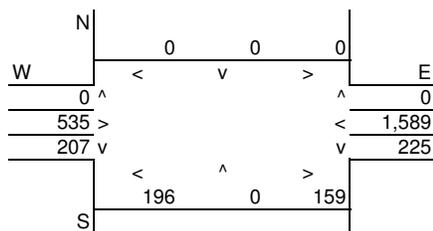
Nearest Air Monitoring Station measuring CO: Mission Viejo - 26081 Via Pera  
 Background 1-hour CO Concentration (ppm): 3.0  
 Background 8-hour CO Concentration (ppm): 1.5  
 Persistence Factor: 0.7  
 Analysis Year: 2004

## Roadway Data

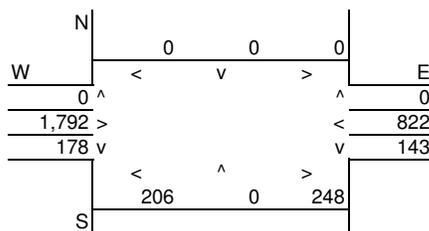
Intersection: Ridge Route & Trabuco  
 Analysis Condition: Existing Traffic Volumes

	Roadway Type	No. of Lanes	Average Speed	
			A.M.	P.M.
North-South Roadway:	Ridge Route	At Grade	20	20
East-West Roadway:	Trabuco	At Grade	20	20

### A.M. Peak Hour Traffic Volumes



### P.M. Peak Hour Traffic Volumes



### Highest Traffic Volumes (Vehicles per Hour)

N-S Road: 787	N-S Road: 775
E-W Road: 2,527	E-W Road: 3,005

## Roadway CO Contributions and Concentrations

Emissions = (A x B x C) / 100,000<sup>1</sup>

Roadway	A <sub>1</sub>	A <sub>2</sub>	A <sub>3</sub>	B	C	Estimated CO Concentrations		
	Reference CO Concentrations 25 Feet	50 Feet	100 Feet	Traffic Volume	Emission Factors <sup>2</sup>	25 Feet	50 Feet	100 Feet
A.M. Peak Traffic Hour								
North-South Road	2.7	2.2	1.7	787	7.65	0.16	0.13	0.10
East-West Road	5.7	4.6	3.4	2,527	7.65	1.10	0.89	0.66
P.M. Peak Traffic Hour								
North-South Road	2.7	2.2	1.7	775	7.65	0.16	0.13	0.10
East-West Road	5.7	4.6	3.4	3,005	7.65	1.31	1.06	0.78

<sup>1</sup> Methodology from Bay Area Air Quality Management District *BAAQMD CEQA Guidelines* (1996).

<sup>2</sup> Emission factors from EMFAC2002 (2003).

## Total Roadway CO Concentrations

Peak Hour Emissions = North-South Concentration + East-West Concentration + Background 1-hour Concentration<sup>2</sup>

8-Hour Emissions = ((Highest Peak Hour Concentration - Background 1-hour Concentration) x Persistence Factor) + Background 8-hour Concentration

	A.M. Peak Hour	P.M. Peak Hour	8-Hour
25 Feet from Roadway Edge	4.3	4.5	2.5
50 Feet from Roadway Edge	4.0	4.2	2.3
100 Feet from Roadway Edge	3.8	3.9	2.1

<sup>2</sup> Methodology from Bay Area Air Quality Management District *BAAQMD CEQA Guidelines* (1996).

# SIMPLIFIED CALINE4 CARBON MONOXIDE ANALYSIS

Project Number: 10953-00  
 Project Title: City of Lake Forest Opportunities Study Program EIR

## Background Information

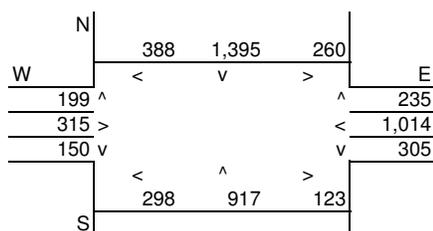
Nearest Air Monitoring Station measuring CO: Mission Viejo - 26081 Via Pera  
 Background 1-hour CO Concentration (ppm): 3.0  
 Background 8-hour CO Concentration (ppm): 1.5  
 Persistence Factor: 0.7  
 Analysis Year: 2004

## Roadway Data

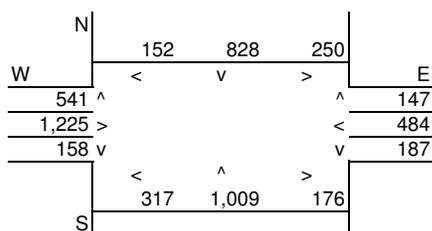
Intersection: El Toro & Trabuco  
 Analysis Condition: Existing Traffic Volumes

	Roadway Type	No. of Lanes	Average Speed		
			A.M.	P.M.	
North-South Roadway:	El Toro	At Grade	8	20	20
East-West Roadway:	Trabuco	At Grade	8	20	20

### A.M. Peak Hour Traffic Volumes



### P.M. Peak Hour Traffic Volumes



### Highest Traffic Volumes (Vehicles per Hour)

N-S Road: 3,394                      N-S Road: 2,927  
 E-W Road: 2,364                      E-W Road: 2,877

## Roadway CO Contributions and Concentrations

$$\text{Emissions} = (A \times B \times C) / 100,000^1$$

Roadway	A <sub>1</sub>	A <sub>2</sub>	A <sub>3</sub>	B	C	Estimated CO Concentrations		
	Reference CO Concentrations 25 Feet	50 Feet	100 Feet	Traffic Volume	Emission Factors <sup>2</sup>	25 Feet	50 Feet	100 Feet
<b>A.M. Peak Traffic Hour</b>								
North-South Road	5.7	4.6	3.4	3,394	7.65	1.48	1.19	0.88
East-West Road	2.2	1.9	1.6	2,364	7.65	0.40	0.34	0.29
<b>P.M. Peak Traffic Hour</b>								
North-South Road	5.7	4.6	3.4	2,927	7.65	1.28	1.03	0.76
East-West Road	2.2	1.9	1.6	2,877	7.65	0.48	0.42	0.35

<sup>1</sup> Methodology from Bay Area Air Quality Management District *BAAQMD CEQA Guidelines* (1996).

<sup>2</sup> Emission factors from EMFAC2002 (2003).

## Total Roadway CO Concentrations

$$\text{Peak Hour Emissions} = \text{North-South Concentration} + \text{East-West Concentration} + \text{Background 1-hour Concentration}^2$$

$$\text{8-Hour Emissions} = ((\text{Highest Peak Hour Concentration} - \text{Background 1-hour Concentration}) \times \text{Persistence Factor}) + \text{Background 8-hour Concentration}$$

	A.M. Peak Hour	P.M. Peak Hour	8-Hour
25 Feet from Roadway Edge	4.9	4.8	2.8
50 Feet from Roadway Edge	4.5	4.4	2.6
100 Feet from Roadway Edge	4.2	4.1	2.3

<sup>2</sup> Methodology from Bay Area Air Quality Management District *BAAQMD CEQA Guidelines* (1996).

# SIMPLIFIED CALINE4 CARBON MONOXIDE ANALYSIS

Project Number: 10953-00  
 Project Title: City of Lake Forest Opportunities Study Program EIR

## Background Information

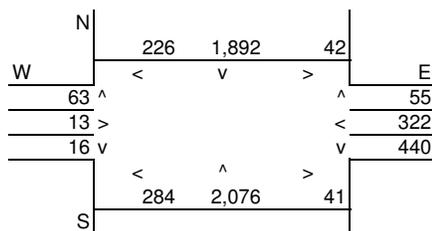
Nearest Air Monitoring Station measuring CO: Mission Viejo - 26081 Via Pera  
 Background 1-hour CO Concentration (ppm): 3.0  
 Background 8-hour CO Concentration (ppm): 1.5  
 Persistence Factor: 0.7  
 Analysis Year: 2004

## Roadway Data

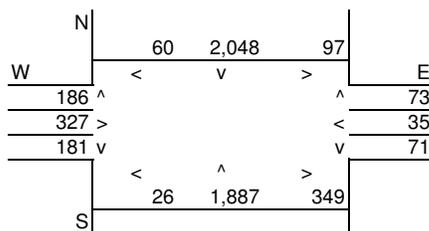
Intersection: Bake & Toledo  
 Analysis Condition: Existing Traffic Volumes

	Roadway Type	No. of Lanes	Average Speed		
			A.M.	P.M.	
North-South Roadway:	Bake	At Grade	8	15	20
East-West Roadway:	Toledo	At Grade	8	15	20

### A.M. Peak Hour Traffic Volumes



### P.M. Peak Hour Traffic Volumes



### Highest Traffic Volumes (Vehicles per Hour)

N-S Road:	4,749	N-S Road:	4,562
E-W Road:	924	E-W Road:	952

## Roadway CO Contributions and Concentrations

Emissions = (A x B x C) / 100,000<sup>1</sup>

Roadway	A <sub>1</sub>	A <sub>2</sub>	A <sub>3</sub>	B	C	Estimated CO Concentrations		
	Reference CO Concentrations 25 Feet	50 Feet	100 Feet	Traffic Volume	Emission Factors <sup>2</sup>	25 Feet	50 Feet	100 Feet
<b>A.M. Peak Traffic Hour</b>								
North-South Road	5.7	4.6	3.4	4,749	8.95	2.42	1.96	1.45
East-West Road	2.2	1.9	1.6	924	8.95	0.18	0.16	0.13
<b>P.M. Peak Traffic Hour</b>								
North-South Road	5.7	4.6	3.4	4,562	7.65	1.99	1.61	1.19
East-West Road	2.2	1.9	1.6	952	7.65	0.16	0.14	0.12

<sup>1</sup> Methodology from Bay Area Air Quality Management District *BAAQMD CEQA Guidelines* (1996).

<sup>2</sup> Emission factors from EMFAC2002 (2003).

## Total Roadway CO Concentrations

Peak Hour Emissions = North-South Concentration + East-West Concentration + Background 1-hour Concentration<sup>2</sup>

8-Hour Emissions = ((Highest Peak Hour Concentration - Background 1-hour Concentration) x Persistence Factor) + Background 8-hour Concentration

	A.M. Peak Hour	P.M. Peak Hour	8-Hour
25 Feet from Roadway Edge	5.6	5.2	3.3
50 Feet from Roadway Edge	5.1	4.7	3.0
100 Feet from Roadway Edge	4.6	4.3	2.6

<sup>2</sup> Methodology from Bay Area Air Quality Management District *BAAQMD CEQA Guidelines* (1996).

# SIMPLIFIED CALINE4 CARBON MONOXIDE ANALYSIS

Project Number: 10953-00  
 Project Title: City of Lake Forest Opportunities Study Program EIR

## Background Information

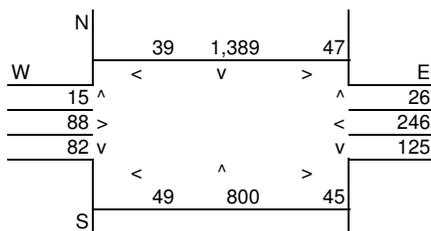
Nearest Air Monitoring Station measuring CO: Mission Viejo - 26081 Via Pera  
 Background 1-hour CO Concentration (ppm): 3.0  
 Background 8-hour CO Concentration (ppm): 1.5  
 Persistence Factor: 0.7  
 Analysis Year: 2004

## Roadway Data

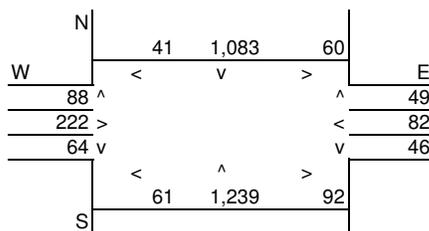
Intersection: Lake Forest & Toledo  
 Analysis Condition: Existing Traffic Volumes

	Roadway Type	No. of Lanes	Average Speed		
			A.M.	P.M.	
North-South Roadway:	Lake Forest	At Grade	8	20	20
East-West Roadway:	Toledo	At Grade	6	20	20

### A.M. Peak Hour Traffic Volumes



### P.M. Peak Hour Traffic Volumes



### Highest Traffic Volumes (Vehicles per Hour)

N-S Road:	2,490	N-S Road:	2,585
E-W Road:	577	E-W Road:	558

## Roadway CO Contributions and Concentrations

Emissions = (A x B x C) / 100,000<sup>1</sup>

Roadway	A <sub>1</sub>	A <sub>2</sub>	A <sub>3</sub>	B	C	Estimated CO Concentrations		
	Reference CO Concentrations 25 Feet	50 Feet	100 Feet	Traffic Volume	Emission Factors <sup>2</sup>	25 Feet	50 Feet	100 Feet
<b>A.M. Peak Traffic Hour</b>								
North-South Road	5.7	4.6	3.4	2,490	7.65	1.09	0.88	0.65
East-West Road	2.3	2.0	1.7	577	7.65	0.10	0.09	0.08
<b>P.M. Peak Traffic Hour</b>								
North-South Road	5.7	4.6	3.4	2,585	7.65	1.13	0.91	0.67
East-West Road	2.3	2.0	1.7	558	7.65	0.10	0.09	0.07

<sup>1</sup> Methodology from Bay Area Air Quality Management District *BAAQMD CEQA Guidelines* (1996).

<sup>2</sup> Emission factors from EMFAC2002 (2003).

## Total Roadway CO Concentrations

Peak Hour Emissions = North-South Concentration + East-West Concentration + Background 1-hour Concentration<sup>2</sup>

8-Hour Emissions = ((Highest Peak Hour Concentration - Background 1-hour Concentration) x Persistence Factor) + Background 8-hour Concentration

	A.M. Peak Hour	P.M. Peak Hour	8-Hour
25 Feet from Roadway Edge	4.2	4.2	2.3
50 Feet from Roadway Edge	4.0	4.0	2.2
100 Feet from Roadway Edge	3.7	3.7	2.0

<sup>2</sup> Methodology from Bay Area Air Quality Management District *BAAQMD CEQA Guidelines* (1996).

# SIMPLIFIED CALINE4 CARBON MONOXIDE ANALYSIS

Project Number: 10953-00  
 Project Title: City of Lake Forest Opportunities Study Program EIR

## Background Information

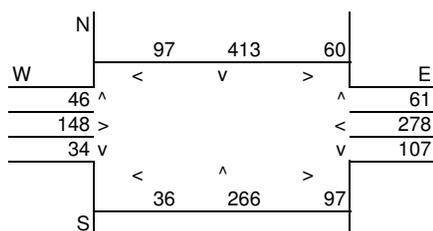
Nearest Air Monitoring Station measuring CO: Mission Viejo - 26081 Via Pera  
 Background 1-hour CO Concentration (ppm): 3.0  
 Background 8-hour CO Concentration (ppm): 1.5  
 Persistence Factor: 0.7  
 Analysis Year: 2004

## Roadway Data

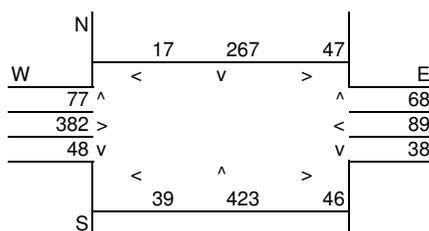
Intersection: Ridge Route & Toledo  
 Analysis Condition: Existing Traffic Volumes

	Roadway Type	No. of Lanes	Average Speed		
			A.M.	P.M.	
North-South Roadway:	Ridge Route	At Grade	6	20	20
East-West Roadway:	Toledo	At Grade	6	20	20

### A.M. Peak Hour Traffic Volumes



### P.M. Peak Hour Traffic Volumes



### Highest Traffic Volumes (Vehicles per Hour)

N-S Road:	953	N-S Road:	899
E-W Road:	751	E-W Road:	670

## Roadway CO Contributions and Concentrations

$$\text{Emissions} = (A \times B \times C) / 100,000^1$$

Roadway	A <sub>1</sub>	A <sub>2</sub>	A <sub>3</sub>	B	C	Estimated CO Concentrations		
	Reference CO Concentrations 25 Feet	50 Feet	100 Feet	Traffic Volume	Emission Factors <sup>2</sup>	25 Feet	50 Feet	100 Feet
A.M. Peak Traffic Hour								
North-South Road	6.1	4.9	3.5	953	7.65	0.44	0.36	0.26
East-West Road	2.3	2.0	1.7	751	7.65	0.13	0.11	0.10
P.M. Peak Traffic Hour								
North-South Road	6.1	4.9	3.5	899	7.65	0.42	0.34	0.24
East-West Road	2.3	2.0	1.7	670	7.65	0.12	0.10	0.09

<sup>1</sup> Methodology from Bay Area Air Quality Management District *BAAQMD CEQA Guidelines* (1996).

<sup>2</sup> Emission factors from EMFAC2002 (2003).

## Total Roadway CO Concentrations

$$\text{Peak Hour Emissions} = \text{North-South Concentration} + \text{East-West Concentration} + \text{Background 1-hour Concentration}^2$$

$$\text{8-Hour Emissions} = ((\text{Highest Peak Hour Concentration} - \text{Background 1-hour Concentration}) \times \text{Persistence Factor}) + \text{Background 8-hour Concentration}$$

	A.M. Peak Hour	P.M. Peak Hour	8-Hour
25 Feet from Roadway Edge	3.6	3.5	1.9
50 Feet from Roadway Edge	3.5	3.4	1.8
100 Feet from Roadway Edge	3.4	3.3	1.7

<sup>2</sup> Methodology from Bay Area Air Quality Management District *BAAQMD CEQA Guidelines* (1996).

# SIMPLIFIED CALINE4 CARBON MONOXIDE ANALYSIS

Project Number: 10953-00  
 Project Title: City of Lake Forest Opportunities Study Program EIR

## Background Information

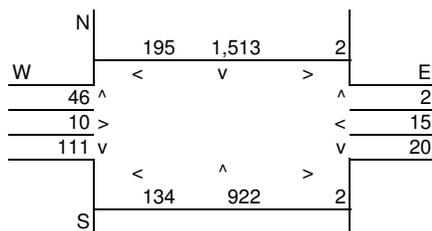
Nearest Air Monitoring Station measuring CO: Mission Viejo - 26081 Via Pera  
 Background 1-hour CO Concentration (ppm): 3.0  
 Background 8-hour CO Concentration (ppm): 1.5  
 Persistence Factor: 0.7  
 Analysis Year: 2004

## Roadway Data

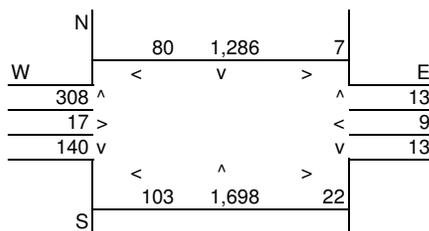
Intersection: El Toro & Toledo  
 Analysis Condition: Existing Traffic Volumes

	Roadway Type	No. of Lanes	Average Speed		
			A.M.	P.M.	
North-South Roadway:	El Toro	At Grade	8	20	20
East-West Roadway:	Toledo	At Grade	4	20	20

### A.M. Peak Hour Traffic Volumes



### P.M. Peak Hour Traffic Volumes



### Highest Traffic Volumes (Vehicles per Hour)

N-S Road:	2,702	N-S Road:	3,392
E-W Road:	511	E-W Road:	657

## Roadway CO Contributions and Concentrations

$$\text{Emissions} = (A \times B \times C) / 100,000^1$$

Roadway	A <sub>1</sub>	A <sub>2</sub>	A <sub>3</sub>	B	C	Estimated CO Concentrations		
	Reference CO Concentrations 25 Feet	50 Feet	100 Feet	Traffic Volume	Emission Factors <sup>2</sup>	25 Feet	50 Feet	100 Feet
A.M. Peak Traffic Hour								
North-South Road	5.7	4.6	3.4	2,702	7.65	1.18	0.95	0.70
East-West Road	2.6	2.2	1.7	511	7.65	0.10	0.09	0.07
P.M. Peak Traffic Hour								
North-South Road	5.7	4.6	3.4	3,392	7.65	1.48	1.19	0.88
East-West Road	2.6	2.2	1.7	657	7.65	0.13	0.11	0.09

<sup>1</sup> Methodology from Bay Area Air Quality Management District *BAAQMD CEQA Guidelines* (1996).

<sup>2</sup> Emission factors from EMFAC2002 (2003).

## Total Roadway CO Concentrations

$$\text{Peak Hour Emissions} = \text{North-South Concentration} + \text{East-West Concentration} + \text{Background 1-hour Concentration}^2$$

$$\text{8-Hour Emissions} = ((\text{Highest Peak Hour Concentration} - \text{Background 1-hour Concentration}) \times \text{Persistence Factor}) + \text{Background 8-hour Concentration}$$

	A.M. Peak Hour	P.M. Peak Hour	8-Hour
25 Feet from Roadway Edge	4.3	4.6	2.6
50 Feet from Roadway Edge	4.0	4.3	2.4
100 Feet from Roadway Edge	3.8	4.0	2.2

<sup>2</sup> Methodology from Bay Area Air Quality Management District *BAAQMD CEQA Guidelines* (1996).

# SIMPLIFIED CALINE4 CARBON MONOXIDE ANALYSIS

Project Number: 10953-00  
 Project Title: City of Lake Forest Opportunities Study Program EIR

## Background Information

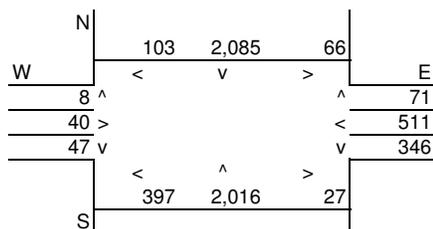
Nearest Air Monitoring Station measuring CO: Mission Viejo - 26081 Via Pera  
 Background 1-hour CO Concentration (ppm): 3.0  
 Background 8-hour CO Concentration (ppm): 1.5  
 Persistence Factor: 0.7  
 Analysis Year: 2004

## Roadway Data

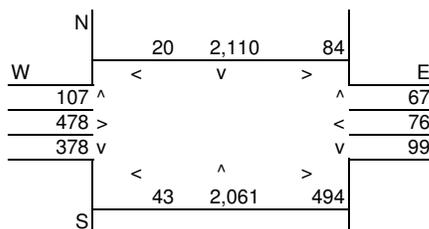
Intersection: Bake & Jeronimo  
 Analysis Condition: Existing Traffic Volumes

	Roadway Type	No. of Lanes	Average Speed		
			A.M.	P.M.	
North-South Roadway:	Bake	At Grade	8	15	20
East-West Roadway:	Jeronimo	At Grade	8	15	20

### A.M. Peak Hour Traffic Volumes



### P.M. Peak Hour Traffic Volumes



### Highest Traffic Volumes (Vehicles per Hour)

N-S Road:	4,918	N-S Road:	5,185
E-W Road:	1,106	E-W Road:	1,298

## Roadway CO Contributions and Concentrations

$$\text{Emissions} = (A \times B \times C) / 100,000^1$$

Roadway	A <sub>1</sub>	A <sub>2</sub>	A <sub>3</sub>	B	C	Estimated CO Concentrations		
	Reference CO Concentrations 25 Feet	50 Feet	100 Feet	Traffic Volume	Emission Factors <sup>2</sup>	25 Feet	50 Feet	100 Feet
<b>A.M. Peak Traffic Hour</b>								
North-South Road	5.7	4.6	3.4	4,918	8.95	2.51	2.03	1.50
East-West Road	2.2	1.9	1.6	1,106	8.95	0.22	0.19	0.16
<b>P.M. Peak Traffic Hour</b>								
North-South Road	5.7	4.6	3.4	5,185	7.65	2.26	1.83	1.35
East-West Road	2.2	1.9	1.6	1,298	7.65	0.22	0.19	0.16

<sup>1</sup> Methodology from Bay Area Air Quality Management District *BAAQMD CEQA Guidelines* (1996).

<sup>2</sup> Emission factors from EMFAC2002 (2003).

## Total Roadway CO Concentrations

$$\text{Peak Hour Emissions} = \text{North-South Concentration} + \text{East-West Concentration} + \text{Background 1-hour Concentration}^2$$

$$\text{8-Hour Emissions} = ((\text{Highest Peak Hour Concentration} - \text{Background 1-hour Concentration}) \times \text{Persistence Factor}) + \text{Background 8-hour Concentration}$$

	A.M. Peak Hour	P.M. Peak Hour	8-Hour
25 Feet from Roadway Edge	5.7	5.5	3.4
50 Feet from Roadway Edge	5.2	5.0	3.0
100 Feet from Roadway Edge	4.7	4.5	2.6

<sup>2</sup> Methodology from Bay Area Air Quality Management District *BAAQMD CEQA Guidelines* (1996).

# SIMPLIFIED CALINE4 CARBON MONOXIDE ANALYSIS

Project Number: 10953-00  
 Project Title: City of Lake Forest Opportunities Study Program EIR

## Background Information

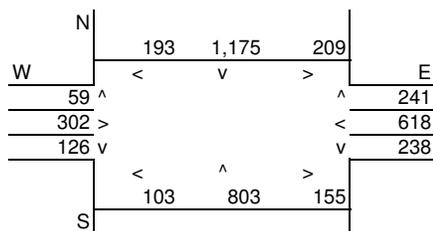
Nearest Air Monitoring Station measuring CO: Mission Viejo - 26081 Via Pera  
 Background 1-hour CO Concentration (ppm): 3.0  
 Background 8-hour CO Concentration (ppm): 1.5  
 Persistence Factor: 0.7  
 Analysis Year: 2004

## Roadway Data

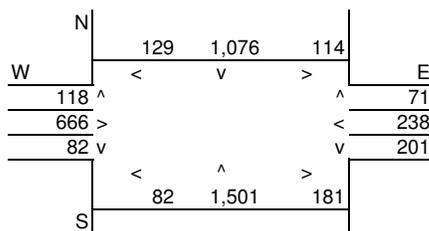
Intersection: Lake Forest & Jeronimo  
 Analysis Condition: Existing Traffic Volumes

	Roadway Type	No. of Lanes	Average Speed		
			A.M.	P.M.	
North-South Roadway:	Lake Forest	At Grade	8	20	20
East-West Roadway:	Jeronimo	At Grade	6	20	20

### A.M. Peak Hour Traffic Volumes



### P.M. Peak Hour Traffic Volumes



### Highest Traffic Volumes (Vehicles per Hour)

N-S Road: 2,680  
 E-W Road: 1,763  
 N-S Road: 3,123  
 E-W Road: 1,471

## Roadway CO Contributions and Concentrations

$$\text{Emissions} = (A \times B \times C) / 100,000^1$$

Roadway	A <sub>1</sub>	A <sub>2</sub>	A <sub>3</sub>	B	C	Estimated CO Concentrations		
	Reference CO Concentrations 25 Feet	50 Feet	100 Feet	Traffic Volume	Emission Factors <sup>2</sup>	25 Feet	50 Feet	100 Feet
<b>A.M. Peak Traffic Hour</b>								
North-South Road	5.7	4.6	3.4	2,680	7.65	1.17	0.94	0.70
East-West Road	2.3	2.0	1.7	1,763	7.65	0.31	0.27	0.23
<b>P.M. Peak Traffic Hour</b>								
North-South Road	5.7	4.6	3.4	3,123	7.65	1.36	1.10	0.81
East-West Road	2.3	2.0	1.7	1,471	7.65	0.26	0.23	0.19

<sup>1</sup> Methodology from Bay Area Air Quality Management District *BAAQMD CEQA Guidelines* (1996).

<sup>2</sup> Emission factors from EMFAC2002 (2003).

## Total Roadway CO Concentrations

$$\text{Peak Hour Emissions} = \text{North-South Concentration} + \text{East-West Concentration} + \text{Background 1-hour Concentration}^2$$

$$\text{8-Hour Emissions} = ((\text{Highest Peak Hour Concentration} - \text{Background 1-hour Concentration}) \times \text{Persistence Factor}) + \text{Background 8-hour Concentration}$$

	A.M. Peak Hour	P.M. Peak Hour	8-Hour
25 Feet from Roadway Edge	4.5	4.6	2.6
50 Feet from Roadway Edge	4.2	4.3	2.4
100 Feet from Roadway Edge	3.9	4.0	2.2

<sup>2</sup> Methodology from Bay Area Air Quality Management District *BAAQMD CEQA Guidelines* (1996).



# SIMPLIFIED CALINE4 CARBON MONOXIDE ANALYSIS

Project Number: 10953-00  
 Project Title: City of Lake Forest Opportunities Study Program EIR

## Background Information

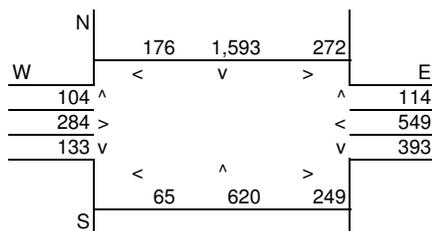
Nearest Air Monitoring Station measuring CO: Mission Viejo - 26081 Via Pera  
 Background 1-hour CO Concentration (ppm): 3.0  
 Background 8-hour CO Concentration (ppm): 1.5  
 Persistence Factor: 0.7  
 Analysis Year: 2004

## Roadway Data

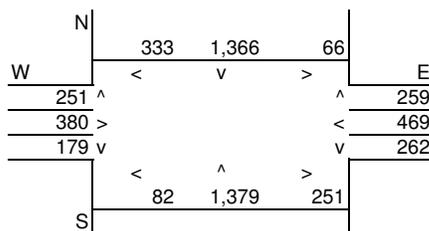
Intersection: El Toro & Jeronimo  
 Analysis Condition: Existing Traffic Volumes

	Roadway Type	No. of Lanes	Average Speed		
			A.M.	P.M.	
North-South Roadway:	El Toro	At Grade	8	20	20
East-West Roadway:	Jeronimo	At Grade	8	20	20

### A.M. Peak Hour Traffic Volumes



### P.M. Peak Hour Traffic Volumes



### Highest Traffic Volumes (Vehicles per Hour)

N-S Road: 3,053                      N-S Road: 3,654  
 E-W Road: 1,861                      E-W Road: 1,694

## Roadway CO Contributions and Concentrations

$$\text{Emissions} = (A \times B \times C) / 100,000^1$$

Roadway	A <sub>1</sub>	A <sub>2</sub>	A <sub>3</sub>	B	C	Estimated CO Concentrations		
	Reference CO Concentrations 25 Feet	50 Feet	100 Feet	Traffic Volume	Emission Factors <sup>2</sup>	25 Feet	50 Feet	100 Feet
A.M. Peak Traffic Hour								
North-South Road	5.7	4.6	3.4	3,053	7.65	1.33	1.07	0.79
East-West Road	2.2	1.9	1.6	1,861	7.65	0.31	0.27	0.23
P.M. Peak Traffic Hour								
North-South Road	5.7	4.6	3.4	3,654	7.65	1.59	1.29	0.95
East-West Road	2.2	1.9	1.6	1,694	7.65	0.29	0.25	0.21

<sup>1</sup> Methodology from Bay Area Air Quality Management District *BAAQMD CEQA Guidelines* (1996).

<sup>2</sup> Emission factors from EMFAC2002 (2003).

## Total Roadway CO Concentrations

$$\text{Peak Hour Emissions} = \text{North-South Concentration} + \text{East-West Concentration} + \text{Background 1-hour Concentration}^2$$

$$\text{8-Hour Emissions} = ((\text{Highest Peak Hour Concentration} - \text{Background 1-hour Concentration}) \times \text{Persistence Factor}) + \text{Background 8-hour Concentration}$$

	A.M. Peak Hour	P.M. Peak Hour	8-Hour
25 Feet from Roadway Edge	4.6	4.9	2.8
50 Feet from Roadway Edge	4.3	4.5	2.6
100 Feet from Roadway Edge	4.0	4.2	2.3

<sup>2</sup> Methodology from Bay Area Air Quality Management District *BAAQMD CEQA Guidelines* (1996).

# SIMPLIFIED CALINE4 CARBON MONOXIDE ANALYSIS

**Project Number:** 10953-00  
**Project Title:** City of Lake Forest Opportunities Study Program EIR

## Background Information

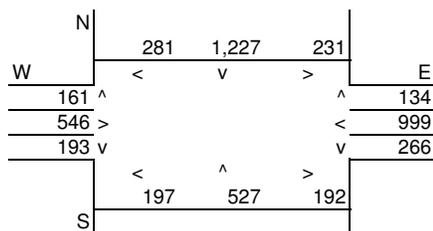
Nearest Air Monitoring Station measuring CO: Mission Viejo - 26081 Via Pera  
 Background 1-hour CO Concentration (ppm): 3.0  
 Background 8-hour CO Concentration (ppm): 1.5  
 Persistence Factor: 0.7  
 Analysis Year: 2004

## Roadway Data

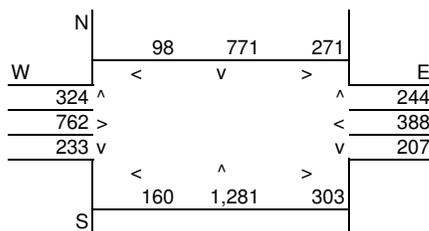
Intersection: Los Alisos & Jeronimo  
 Analysis Condition: Existing Traffic Volumes

	Roadway Type	No. of Lanes	Average Speed		
			A.M.	P.M.	
North-South Roadway:	Los Alisos	At Grade	8	20	20
East-West Roadway:	Jeronimo	At Grade	8	20	20

### A.M. Peak Hour Traffic Volumes



### P.M. Peak Hour Traffic Volumes



### Highest Traffic Volumes (Vehicles per Hour)

N-S Road: 2,602                      N-S Road: 2,989  
 E-W Road: 2,377                      E-W Road: 2,175

## Roadway CO Contributions and Concentrations

Emissions = (A x B x C) / 100,000<sup>1</sup>

Roadway	A <sub>1</sub>	A <sub>2</sub>	A <sub>3</sub>	B	C	Estimated CO Concentrations		
	Reference CO Concentrations 25 Feet	50 Feet	100 Feet	Traffic Volume	Emission Factors <sup>2</sup>	25 Feet	50 Feet	100 Feet
<b>A.M. Peak Traffic Hour</b>								
North-South Road	5.7	4.6	3.4	2,602	7.65	1.14	0.92	0.68
East-West Road	2.2	1.9	1.6	2,377	7.65	0.40	0.35	0.29
<b>P.M. Peak Traffic Hour</b>								
North-South Road	5.7	4.6	3.4	2,989	7.65	1.30	1.05	0.78
East-West Road	2.2	1.9	1.6	2,175	7.65	0.37	0.32	0.27

<sup>1</sup> Methodology from Bay Area Air Quality Management District *BAAQMD CEQA Guidelines* (1996).

<sup>2</sup> Emission factors from EMFAC2002 (2003).

## Total Roadway CO Concentrations

Peak Hour Emissions = North-South Concentration + East-West Concentration + Background 1-hour Concentration<sup>2</sup>

8-Hour Emissions = ((Highest Peak Hour Concentration - Background 1-hour Concentration) x Persistence Factor) + Background 8-hour Concentration

	A.M. Peak Hour	P.M. Peak Hour	8-Hour
25 Feet from Roadway Edge	4.5	4.7	2.7
50 Feet from Roadway Edge	4.3	4.4	2.4
100 Feet from Roadway Edge	4.0	4.0	2.2

<sup>2</sup> Methodology from Bay Area Air Quality Management District *BAAQMD CEQA Guidelines* (1996).

# SIMPLIFIED CALINE4 CARBON MONOXIDE ANALYSIS

Project Number: 10953-00  
 Project Title: City of Lake Forest Opportunities Study Program EIR

## Background Information

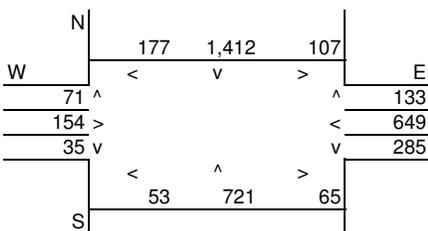
Nearest Air Monitoring Station measuring CO: Mission Viejo - 26081 Via Pera  
 Background 1-hour CO Concentration (ppm): 3.0  
 Background 8-hour CO Concentration (ppm): 1.5  
 Persistence Factor: 0.7  
 Analysis Year: 2004

## Roadway Data

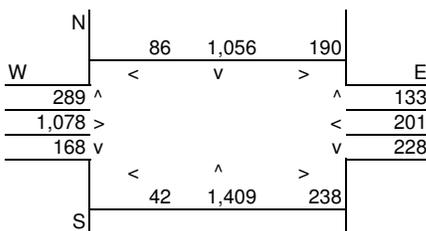
Intersection: Lake Forest & Muirlands  
 Analysis Condition: Existing Traffic Volumes

	Roadway Type	No. of Lanes	Average Speed		
			A.M.	P.M.	
North-South Roadway:	Lake Forest	At Grade	8	20	20
East-West Roadway:	Muirlands	At Grade	8	20	20

### A.M. Peak Hour Traffic Volumes



### P.M. Peak Hour Traffic Volumes



### Highest Traffic Volumes (Vehicles per Hour)

N-S Road: 2,621  
 E-W Road: 1,393  
 N-S Road: 3,163  
 E-W Road: 2,068

## Roadway CO Contributions and Concentrations

$$\text{Emissions} = (A \times B \times C) / 100,000^1$$

Roadway	A <sub>1</sub>	A <sub>2</sub>	A <sub>3</sub>	B	C	Estimated CO Concentrations		
	Reference CO Concentrations 25 Feet	50 Feet	100 Feet	Traffic Volume	Emission Factors <sup>2</sup>	25 Feet	50 Feet	100 Feet
A.M. Peak Traffic Hour								
North-South Road	5.7	4.6	3.4	2,621	7.65	1.14	0.92	0.68
East-West Road	2.2	1.9	1.6	1,393	7.65	0.23	0.20	0.17
P.M. Peak Traffic Hour								
North-South Road	5.7	4.6	3.4	3,163	7.65	1.38	1.11	0.82
East-West Road	2.2	1.9	1.6	2,068	7.65	0.35	0.30	0.25

<sup>1</sup> Methodology from Bay Area Air Quality Management District *BAAQMD CEQA Guidelines* (1996).

<sup>2</sup> Emission factors from EMFAC2002 (2003).

## Total Roadway CO Concentrations

$$\text{Peak Hour Emissions} = \text{North-South Concentration} + \text{East-West Concentration} + \text{Background 1-hour Concentration}^2$$

$$\text{8-Hour Emissions} = ((\text{Highest Peak Hour Concentration} - \text{Background 1-hour Concentration}) \times \text{Persistence Factor}) + \text{Background 8-hour Concentration}$$

	A.M. Peak Hour	P.M. Peak Hour	8-Hour
25 Feet from Roadway Edge	4.4	4.7	2.7
50 Feet from Roadway Edge	4.1	4.4	2.5
100 Feet from Roadway Edge	3.9	4.1	2.2

<sup>2</sup> Methodology from Bay Area Air Quality Management District *BAAQMD CEQA Guidelines* (1996).

# SIMPLIFIED CALINE4 CARBON MONOXIDE ANALYSIS

Project Number: 10953-00  
 Project Title: City of Lake Forest Opportunities Study Program EIR

## Background Information

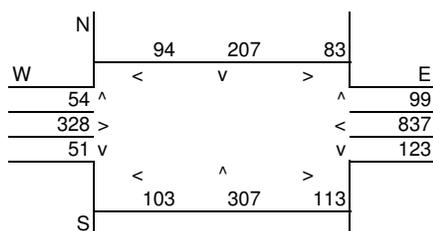
Nearest Air Monitoring Station measuring CO: Mission Viejo - 26081 Via Pera  
 Background 1-hour CO Concentration (ppm): 3.0  
 Background 8-hour CO Concentration (ppm): 1.5  
 Persistence Factor: 0.7  
 Analysis Year: 2004

## Roadway Data

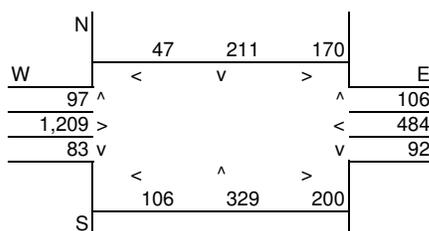
Intersection: Ridge Route & Muirlands  
 Analysis Condition: Existing Traffic Volumes

	Roadway Type	No. of Lanes	Average Speed		
			A.M.	P.M.	
North-South Roadway:	Ridge Route	At Grade	8	20	20
East-West Roadway:	Muirlands	At Grade	8	20	20

### A.M. Peak Hour Traffic Volumes



### P.M. Peak Hour Traffic Volumes



### Highest Traffic Volumes (Vehicles per Hour)

N-S Road:	904	N-S Road:	1,021
E-W Road:	1,583	E-W Road:	2,261

## Roadway CO Contributions and Concentrations

$$\text{Emissions} = (A \times B \times C) / 100,000^1$$

Roadway	A <sub>1</sub>	A <sub>2</sub>	A <sub>3</sub>	B	C	Estimated CO Concentrations		
	Reference CO Concentrations 25 Feet	50 Feet	100 Feet	Traffic Volume	Emission Factors <sup>2</sup>	25 Feet	50 Feet	100 Feet
<b>A.M. Peak Traffic Hour</b>								
North-South Road	2.2	1.9	1.6	904	7.65	0.15	0.13	0.11
East-West Road	5.7	4.6	3.4	1,583	7.65	0.69	0.56	0.41
<b>P.M. Peak Traffic Hour</b>								
North-South Road	2.2	1.9	1.6	1,021	7.65	0.17	0.15	0.13
East-West Road	5.7	4.6	3.4	2,261	7.65	0.99	0.80	0.59

<sup>1</sup> Methodology from Bay Area Air Quality Management District *BAAQMD CEQA Guidelines* (1996).

<sup>2</sup> Emission factors from EMFAC2002 (2003).

## Total Roadway CO Concentrations

$$\text{Peak Hour Emissions} = \text{North-South Concentration} + \text{East-West Concentration} + \text{Background 1-hour Concentration}^2$$

$$\text{8-Hour Emissions} = ((\text{Highest Peak Hour Concentration} - \text{Background 1-hour Concentration}) \times \text{Persistence Factor}) + \text{Background 8-hour Concentration}$$

	A.M. Peak Hour	P.M. Peak Hour	8-Hour
25 Feet from Roadway Edge	3.8	4.2	2.3
50 Feet from Roadway Edge	3.7	3.9	2.2
100 Feet from Roadway Edge	3.5	3.7	2.0

<sup>2</sup> Methodology from Bay Area Air Quality Management District *BAAQMD CEQA Guidelines* (1996).

# SIMPLIFIED CALINE4 CARBON MONOXIDE ANALYSIS

Project Number: 10953-00  
 Project Title: City of Lake Forest Opportunities Study Program EIR

## Background Information

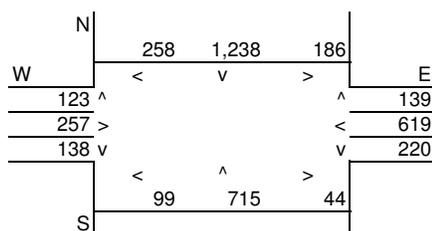
Nearest Air Monitoring Station measuring CO: Mission Viejo - 26081 Via Pera  
 Background 1-hour CO Concentration (ppm): 3.0  
 Background 8-hour CO Concentration (ppm): 1.5  
 Persistence Factor: 0.7  
 Analysis Year: 2004

## Roadway Data

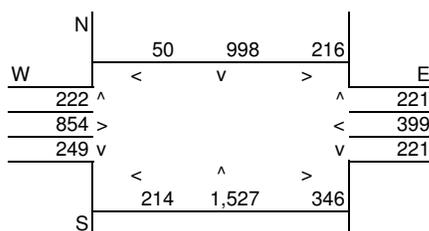
Intersection: El Toro & Muirlands  
 Analysis Condition: Existing Traffic Volumes

	Roadway Type	No. of Lanes	Average Speed		
			A.M.	P.M.	
North-South Roadway:	El Toro	At Grade	8	20	20
East-West Roadway:	Muirlands	At Grade	8	20	20

### A.M. Peak Hour Traffic Volumes



### P.M. Peak Hour Traffic Volumes



### Highest Traffic Volumes (Vehicles per Hour)

N-S Road: 2,659                      N-S Road: 3,555  
 E-W Road: 1,494                      E-W Road: 2,257

## Roadway CO Contributions and Concentrations

$$\text{Emissions} = (A \times B \times C) / 100,000^1$$

Roadway	A <sub>1</sub>	A <sub>2</sub>	A <sub>3</sub>	B	C	Estimated CO Concentrations		
	Reference CO Concentrations 25 Feet	50 Feet	100 Feet	Traffic Volume	Emission Factors <sup>2</sup>	25 Feet	50 Feet	100 Feet
A.M. Peak Traffic Hour								
North-South Road	5.7	4.6	3.4	2,659	7.65	1.16	0.94	0.69
East-West Road	2.2	1.9	1.6	1,494	7.65	0.25	0.22	0.18
P.M. Peak Traffic Hour								
North-South Road	5.7	4.6	3.4	3,555	7.65	1.55	1.25	0.93
East-West Road	2.2	1.9	1.6	2,257	7.65	0.38	0.33	0.28

<sup>1</sup> Methodology from Bay Area Air Quality Management District *BAAQMD CEQA Guidelines* (1996).

<sup>2</sup> Emission factors from EMFAC2002 (2003).

## Total Roadway CO Concentrations

$$\text{Peak Hour Emissions} = \text{North-South Concentration} + \text{East-West Concentration} + \text{Background 1-hour Concentration}^2$$

$$\text{8-Hour Emissions} = ((\text{Highest Peak Hour Concentration} - \text{Background 1-hour Concentration}) \times \text{Persistence Factor}) + \text{Background 8-hour Concentration}$$

	A.M. Peak Hour	P.M. Peak Hour	8-Hour
25 Feet from Roadway Edge	4.4	4.9	2.8
50 Feet from Roadway Edge	4.2	4.6	2.6
100 Feet from Roadway Edge	3.9	4.2	2.3

<sup>2</sup> Methodology from Bay Area Air Quality Management District *BAAQMD CEQA Guidelines* (1996).

# SIMPLIFIED CALINE4 CARBON MONOXIDE ANALYSIS

Project Number: 10953-00  
 Project Title: City of Lake Forest Opportunities Study Program EIR

## Background Information

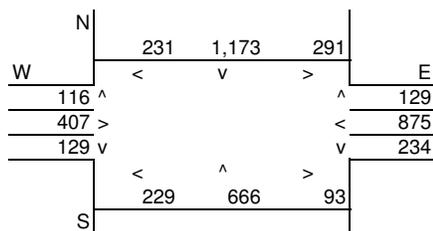
Nearest Air Monitoring Station measuring CO: Mission Viejo - 26081 Via Pera  
 Background 1-hour CO Concentration (ppm): 3.0  
 Background 8-hour CO Concentration (ppm): 1.5  
 Persistence Factor: 0.7  
 Analysis Year: 2004

## Roadway Data

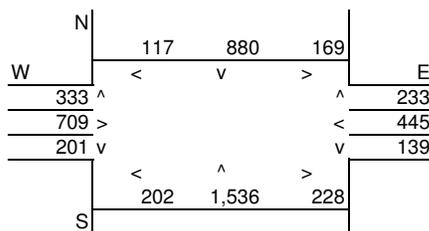
Intersection: Los Alisos & Muirlands  
 Analysis Condition: Existing Traffic Volumes

	Roadway Type	No. of Lanes	Average Speed		
			A.M.	P.M.	
North-South Roadway:	Los Alisos	At Grade	8	20	15
East-West Roadway:	Muirlands	At Grade	6	20	15

### A.M. Peak Hour Traffic Volumes



### P.M. Peak Hour Traffic Volumes



### Highest Traffic Volumes (Vehicles per Hour)

N-S Road:	2,606	N-S Road:	3,268
E-W Road:	2,029	E-W Road:	2,007

## Roadway CO Contributions and Concentrations

$$\text{Emissions} = (A \times B \times C) / 100,000^1$$

Roadway	A <sub>1</sub>	A <sub>2</sub>	A <sub>3</sub>	B	C	Estimated CO Concentrations		
	Reference CO Concentrations 25 Feet	50 Feet	100 Feet	Traffic Volume	Emission Factors <sup>2</sup>	25 Feet	50 Feet	100 Feet
<b>A.M. Peak Traffic Hour</b>								
North-South Road	5.7	4.6	3.4	2,606	7.65	1.14	0.92	0.68
East-West Road	2.3	2.0	1.7	2,029	7.65	0.36	0.31	0.26
<b>P.M. Peak Traffic Hour</b>								
North-South Road	5.7	4.6	3.4	3,268	8.95	1.67	1.35	0.99
East-West Road	2.3	2.0	1.7	2,007	8.95	0.41	0.36	0.31

<sup>1</sup> Methodology from Bay Area Air Quality Management District *BAAQMD CEQA Guidelines* (1996).

<sup>2</sup> Emission factors from EMFAC2002 (2003).

## Total Roadway CO Concentrations

$$\text{Peak Hour Emissions} = \text{North-South Concentration} + \text{East-West Concentration} + \text{Background 1-hour Concentration}^2$$

$$\text{8-Hour Emissions} = ((\text{Highest Peak Hour Concentration} - \text{Background 1-hour Concentration}) \times \text{Persistence Factor}) + \text{Background 8-hour Concentration}$$

	A.M. Peak Hour	P.M. Peak Hour	8-Hour
25 Feet from Roadway Edge	4.5	5.1	2.9
50 Feet from Roadway Edge	4.2	4.7	2.7
100 Feet from Roadway Edge	3.9	4.3	2.4

<sup>2</sup> Methodology from Bay Area Air Quality Management District *BAAQMD CEQA Guidelines* (1996).

# SIMPLIFIED CALINE4 CARBON MONOXIDE ANALYSIS

Project Number: 10953-00  
 Project Title: City of Lake Forest Opportunities Study Program EIR

## Background Information

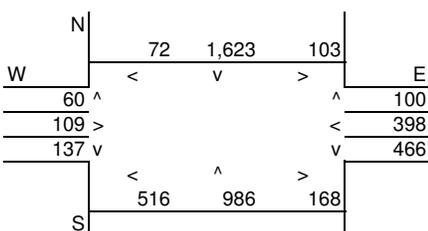
Nearest Air Monitoring Station measuring CO: Mission Viejo - 26081 Via Pera  
 Background 1-hour CO Concentration (ppm): 3.0  
 Background 8-hour CO Concentration (ppm): 1.5  
 Persistence Factor: 0.7  
 Analysis Year: 2004

## Roadway Data

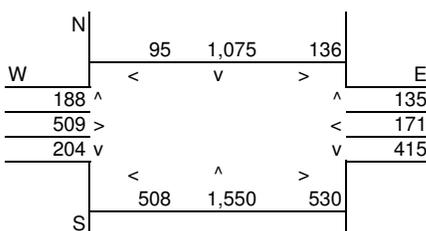
Intersection: Lake Forest & Rockfield  
 Analysis Condition: Existing Traffic Volumes

	Roadway Type	No. of Lanes	Average Speed		
			A.M.	P.M.	
North-South Roadway:	Lake Forest	At Grade	8	20	20
East-West Roadway:	Rockfield	At Grade	8	20	20

### A.M. Peak Hour Traffic Volumes



### P.M. Peak Hour Traffic Volumes



### Highest Traffic Volumes (Vehicles per Hour)

N-S Road: 3,896                      N-S Road: 4,282  
 E-W Road: 1,344                      E-W Road: 1,896

## Roadway CO Contributions and Concentrations

Emissions = (A x B x C) / 100,000<sup>1</sup>

Roadway	A <sub>1</sub>	A <sub>2</sub>	A <sub>3</sub>	B	C	Estimated CO Concentrations		
	Reference CO Concentrations 25 Feet	50 Feet	100 Feet	Traffic Volume	Emission Factors <sup>2</sup>	25 Feet	50 Feet	100 Feet
<b>A.M. Peak Traffic Hour</b>								
North-South Road	5.7	4.6	3.4	3,896	7.65	1.70	1.37	1.01
East-West Road	2.2	1.9	1.6	1,344	7.65	0.23	0.20	0.16
<b>P.M. Peak Traffic Hour</b>								
North-South Road	5.7	4.6	3.4	4,282	7.65	1.87	1.51	1.11
East-West Road	2.2	1.9	1.6	1,896	7.65	0.32	0.28	0.23

<sup>1</sup> Methodology from Bay Area Air Quality Management District *BAAQMD CEQA Guidelines* (1996).

<sup>2</sup> Emission factors from EMFAC2002 (2003).

## Total Roadway CO Concentrations

Peak Hour Emissions = North-South Concentration + East-West Concentration + Background 1-hour Concentration<sup>2</sup>

8-Hour Emissions = ((Highest Peak Hour Concentration - Background 1-hour Concentration) x Persistence Factor) + Background 8-hour Concentration

	A.M. Peak Hour	P.M. Peak Hour	8-Hour
25 Feet from Roadway Edge	4.9	5.2	3.0
50 Feet from Roadway Edge	4.6	4.8	2.7
100 Feet from Roadway Edge	4.2	4.3	2.4

<sup>2</sup> Methodology from Bay Area Air Quality Management District *BAAQMD CEQA Guidelines* (1996).

# SIMPLIFIED CALINE4 CARBON MONOXIDE ANALYSIS

Project Number: 10953-00  
 Project Title: City of Lake Forest Opportunities Study Program EIR

## Background Information

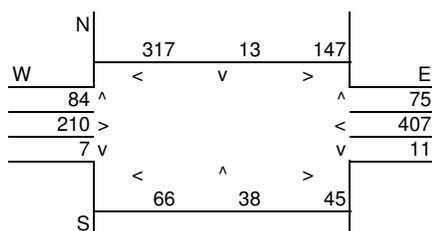
Nearest Air Monitoring Station measuring CO: Mission Viejo - 26081 Via Pera  
 Background 1-hour CO Concentration (ppm): 3.0  
 Background 8-hour CO Concentration (ppm): 1.5  
 Persistence Factor: 0.7  
 Analysis Year: 2004

## Roadway Data

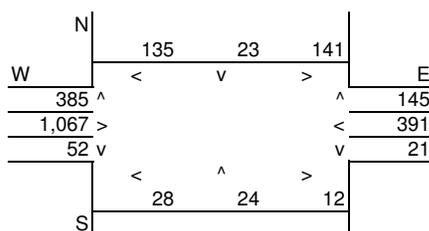
Intersection: Ridge Route & Rockfield  
 Analysis Condition: Existing Traffic Volumes

	Roadway Type	No. of Lanes	Average Speed	
			A.M.	P.M.
North-South Roadway:	Ridge Route	4	20	20
East-West Roadway:	Rockfield	6	20	20

### A.M. Peak Hour Traffic Volumes



### P.M. Peak Hour Traffic Volumes



### Highest Traffic Volumes (Vehicles per Hour)

N-S Road:	674	N-S Road:	853
E-W Road:	1,091	E-W Road:	2,058

## Roadway CO Contributions and Concentrations

$$\text{Emissions} = (A \times B \times C) / 100,000^1$$

Roadway	A <sub>1</sub>	A <sub>2</sub>	A <sub>3</sub>	B	C	Estimated CO Concentrations		
	Reference CO Concentrations 25 Feet	50 Feet	100 Feet	Traffic Volume	Emission Factors <sup>2</sup>	25 Feet	50 Feet	100 Feet
A.M. Peak Traffic Hour								
North-South Road	2.6	2.2	1.7	674	7.65	0.13	0.11	0.09
East-West Road	6.1	4.9	3.5	1,091	7.65	0.51	0.41	0.29
P.M. Peak Traffic Hour								
North-South Road	2.6	2.2	1.7	853	7.65	0.17	0.14	0.11
East-West Road	6.1	4.9	3.5	2,058	7.65	0.96	0.77	0.55

<sup>1</sup> Methodology from Bay Area Air Quality Management District *BAAQMD CEQA Guidelines* (1996).

<sup>2</sup> Emission factors from EMFAC2002 (2003).

## Total Roadway CO Concentrations

$$\text{Peak Hour Emissions} = \text{North-South Concentration} + \text{East-West Concentration} + \text{Background 1-hour Concentration}^2$$

$$\text{8-Hour Emissions} = ((\text{Highest Peak Hour Concentration} - \text{Background 1-hour Concentration}) \times \text{Persistence Factor}) + \text{Background 8-hour Concentration}$$

	A.M. Peak Hour	P.M. Peak Hour	8-Hour
25 Feet from Roadway Edge	3.6	4.1	2.3
50 Feet from Roadway Edge	3.5	3.9	2.1
100 Feet from Roadway Edge	3.4	3.7	2.0

<sup>2</sup> Methodology from Bay Area Air Quality Management District *BAAQMD CEQA Guidelines* (1996).

# SIMPLIFIED CALINE4 CARBON MONOXIDE ANALYSIS

**Project Number:** 10953-00  
**Project Title:** City of Lake Forest Opportunities Study Program EIR

## Background Information

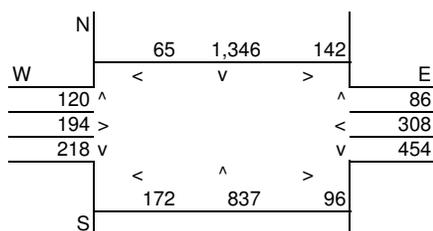
Nearest Air Monitoring Station measuring CO: Mission Viejo - 26081 Via Pera  
 Background 1-hour CO Concentration (ppm): 3.0  
 Background 8-hour CO Concentration (ppm): 1.5  
 Persistence Factor: 0.7  
 Analysis Year: 2004

## Roadway Data

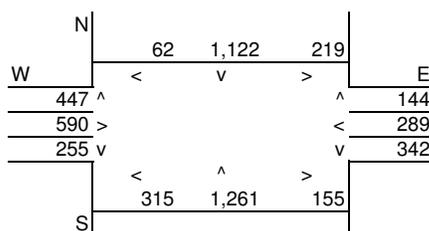
Intersection: El Toro & Rockfield  
 Analysis Condition: Existing Traffic Volumes

	Roadway Type	No. of Lanes	Average Speed		
			A.M.	P.M.	
North-South Roadway:	El Toro	At Grade	8	20	20
East-West Roadway:	Rockfield	At Grade	8	20	20

### A.M. Peak Hour Traffic Volumes



### P.M. Peak Hour Traffic Volumes



### Highest Traffic Volumes (Vehicles per Hour)

N-S Road: 3,123                      N-S Road: 3,450  
 E-W Road: 1,280                    E-W Road: 1,958

## Roadway CO Contributions and Concentrations

$$\text{Emissions} = (A \times B \times C) / 100,000^1$$

Roadway	Reference CO Concentrations			B Traffic Volume	C Emission Factors <sup>2</sup>	Estimated CO Concentrations		
	A <sub>1</sub> 25 Feet	A <sub>2</sub> 50 Feet	A <sub>3</sub> 100 Feet			25 Feet	50 Feet	100 Feet
<b>A.M. Peak Traffic Hour</b>								
North-South Road	5.7	4.6	3.4	3,123	7.65	1.36	1.10	0.81
East-West Road	2.2	1.9	1.6	1,280	7.65	0.22	0.19	0.16
<b>P.M. Peak Traffic Hour</b>								
North-South Road	5.7	4.6	3.4	3,450	7.65	1.50	1.21	0.90
East-West Road	2.2	1.9	1.6	1,958	7.65	0.33	0.28	0.24

<sup>1</sup> Methodology from Bay Area Air Quality Management District *BAAQMD CEQA Guidelines* (1996).

<sup>2</sup> Emission factors from EMFAC2002 (2003).

## Total Roadway CO Concentrations

$$\text{Peak Hour Emissions} = \text{North-South Concentration} + \text{East-West Concentration} + \text{Background 1-hour Concentration}^2$$

$$\text{8-Hour Emissions} = ((\text{Highest Peak Hour Concentration} - \text{Background 1-hour Concentration}) \times \text{Persistence Factor}) + \text{Background 8-hour Concentration}$$

	A.M. Peak Hour	P.M. Peak Hour	8-Hour
25 Feet from Roadway Edge	4.6	4.8	2.8
50 Feet from Roadway Edge	4.3	4.5	2.5
100 Feet from Roadway Edge	4.0	4.1	2.3

<sup>2</sup> Methodology from Bay Area Air Quality Management District *BAAQMD CEQA Guidelines* (1996).

# SIMPLIFIED CALINE4 CARBON MONOXIDE ANALYSIS

Project Number: 10953-00  
 Project Title: City of Lake Forest Opportunities Study Program EIR

## Background Information

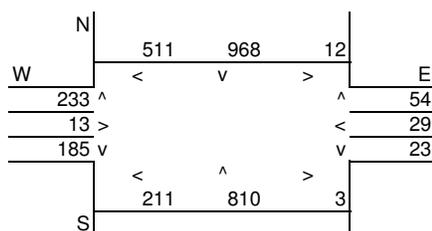
Nearest Air Monitoring Station measuring CO: Mission Viejo - 26081 Via Pera  
 Background 1-hour CO Concentration (ppm): 3.0  
 Background 8-hour CO Concentration (ppm): 1.5  
 Persistence Factor: 0.7  
 Analysis Year: 2004

## Roadway Data

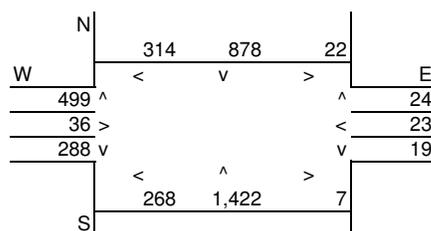
Intersection: Los Alisos & Rockfield  
 Analysis Condition: Existing Traffic Volumes

	Roadway Type	No. of Lanes	Average Speed		
			A.M.	P.M.	
North-South Roadway:	Los Alisos	At Grade	6	20	20
East-West Roadway:	Rockfield	At Grade	6	20	20

### A.M. Peak Hour Traffic Volumes



### P.M. Peak Hour Traffic Volumes



### Highest Traffic Volumes (Vehicles per Hour)

N-S Road: 2,588                      N-S Road: 3,159  
 E-W Road: 1,182                      E-W Road: 1,428

## Roadway CO Contributions and Concentrations

$$\text{Emissions} = (A \times B \times C) / 100,000^1$$

Roadway	A <sub>1</sub>	A <sub>2</sub>	A <sub>3</sub>	B	C	Estimated CO Concentrations		
	Reference CO Concentrations 25 Feet	50 Feet	100 Feet	Traffic Volume	Emission Factors <sup>2</sup>	25 Feet	50 Feet	100 Feet
A.M. Peak Traffic Hour								
North-South Road	6.1	4.9	3.5	2,588	7.65	1.21	0.97	0.69
East-West Road	2.3	2.0	1.7	1,182	7.65	0.21	0.18	0.15
P.M. Peak Traffic Hour								
North-South Road	6.1	4.9	3.5	3,159	7.65	1.47	1.18	0.85
East-West Road	2.3	2.0	1.7	1,428	7.65	0.25	0.22	0.19

<sup>1</sup> Methodology from Bay Area Air Quality Management District *BAAQMD CEQA Guidelines* (1996).

<sup>2</sup> Emission factors from EMFAC2002 (2003).

## Total Roadway CO Concentrations

$$\text{Peak Hour Emissions} = \text{North-South Concentration} + \text{East-West Concentration} + \text{Background 1-hour Concentration}^2$$

$$\text{8-Hour Emissions} = ((\text{Highest Peak Hour Concentration} - \text{Background 1-hour Concentration}) \times \text{Persistence Factor}) + \text{Background 8-hour Concentration}$$

	A.M. Peak Hour	P.M. Peak Hour	8-Hour
25 Feet from Roadway Edge	4.4	4.7	2.7
50 Feet from Roadway Edge	4.2	4.4	2.5
100 Feet from Roadway Edge	3.8	4.0	2.2

<sup>2</sup> Methodology from Bay Area Air Quality Management District *BAAQMD CEQA Guidelines* (1996).

# SIMPLIFIED CALINE4 CARBON MONOXIDE ANALYSIS

Project Number: 10953-00  
 Project Title: City of Lake Forest Opportunities Study Program EIR

## Background Information

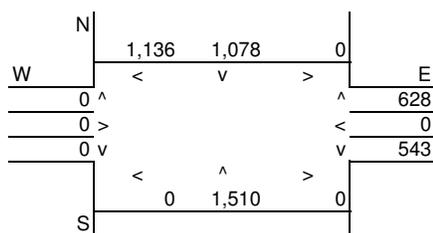
Nearest Air Monitoring Station measuring CO: Mission Viejo - 26081 Via Pera  
 Background 1-hour CO Concentration (ppm): 3.0  
 Background 8-hour CO Concentration (ppm): 1.5  
 Persistence Factor: 0.7  
 Analysis Year: 2004

## Roadway Data

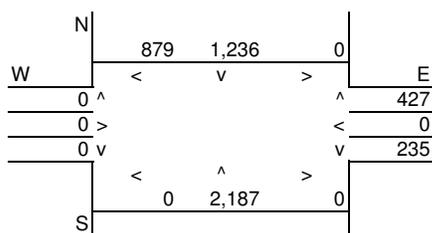
Intersection: Lake Forest & I-5 NB  
 Analysis Condition: Existing Traffic Volumes

	Roadway Type	No. of Lanes	Average Speed		
			A.M.	P.M.	
North-South Roadway:	Lake Forest	At Grade	6	20	20
East-West Roadway:	I-5 NB	At Grade	4	20	20

### A.M. Peak Hour Traffic Volumes



### P.M. Peak Hour Traffic Volumes



### Highest Traffic Volumes (Vehicles per Hour)

N-S Road: 4,352  
 E-W Road: 1,171

N-S Road: 4,729  
 E-W Road: 879

## Roadway CO Contributions and Concentrations

$$\text{Emissions} = (A \times B \times C) / 100,000^1$$

Roadway	A <sub>1</sub>	A <sub>2</sub>	A <sub>3</sub>	B	C	Estimated CO Concentrations		
	Reference CO Concentrations 25 Feet	50 Feet	100 Feet	Traffic Volume	Emission Factors <sup>2</sup>	25 Feet	50 Feet	100 Feet
A.M. Peak Traffic Hour								
North-South Road	6.1	4.9	3.5	4,352	7.65	2.03	1.63	1.17
East-West Road	2.6	2.2	1.7	1,171	7.65	0.23	0.20	0.15
P.M. Peak Traffic Hour								
North-South Road	6.1	4.9	3.5	4,729	7.65	2.21	1.77	1.27
East-West Road	2.6	2.2	1.7	879	7.65	0.17	0.15	0.11

<sup>1</sup> Methodology from Bay Area Air Quality Management District *BAAQMD CEQA Guidelines* (1996).

<sup>2</sup> Emission factors from EMFAC2002 (2003).

## Total Roadway CO Concentrations

$$\text{Peak Hour Emissions} = \text{North-South Concentration} + \text{East-West Concentration} + \text{Background 1-hour Concentration}^2$$

$$\text{8-Hour Emissions} = ((\text{Highest Peak Hour Concentration} - \text{Background 1-hour Concentration}) \times \text{Persistence Factor}) + \text{Background 8-hour Concentration}$$

	A.M. Peak Hour	P.M. Peak Hour	8-Hour
25 Feet from Roadway Edge	5.3	5.4	3.2
50 Feet from Roadway Edge	4.8	4.9	2.8
100 Feet from Roadway Edge	4.3	4.4	2.5

<sup>2</sup> Methodology from Bay Area Air Quality Management District *BAAQMD CEQA Guidelines* (1996).

# SIMPLIFIED CALINE4 CARBON MONOXIDE ANALYSIS

**Project Number:** 10953-00  
**Project Title:** City of Lake Forest Opportunities Study Program EIR

## Background Information

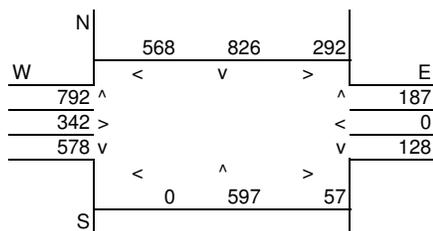
Nearest Air Monitoring Station measuring CO: Mission Viejo - 26081 Via Pera  
 Background 1-hour CO Concentration (ppm): 3.0  
 Background 8-hour CO Concentration (ppm): 1.5  
 Persistence Factor: 0.7  
 Analysis Year: 2004

## Roadway Data

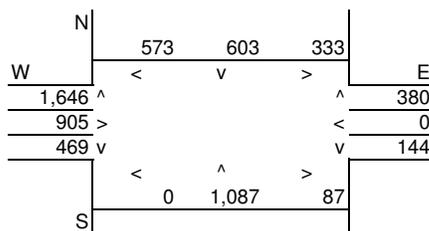
Intersection: Lake Forest & I-5/Carlota  
 Analysis Condition: Existing Traffic Volumes

	Roadway Type	No. of Lanes	Average Speed		
			A.M.	P.M.	
North-South Roadway:	Lake Forest	At Grade	8	20	20
East-West Roadway:	I-5 Carlota	At Grade	8	20	20

### A.M. Peak Hour Traffic Volumes



### P.M. Peak Hour Traffic Volumes



### Highest Traffic Volumes (Vehicles per Hour)

N-S Road: 3,262      N-S Road: 4,622  
 E-W Road: 2,280      E-W Road: 3,593

## Roadway CO Contributions and Concentrations

$$\text{Emissions} = (A \times B \times C) / 100,000^1$$

Roadway	A <sub>1</sub>	A <sub>2</sub>	A <sub>3</sub>	B	C	Estimated CO Concentrations		
	Reference CO Concentrations 25 Feet	50 Feet	100 Feet	Traffic Volume	Emission Factors <sup>2</sup>	25 Feet	50 Feet	100 Feet
<b>A.M. Peak Traffic Hour</b>								
North-South Road	5.7	4.6	3.4	3,262	7.65	1.42	1.15	0.85
East-West Road	2.2	1.9	1.6	2,280	7.65	0.38	0.33	0.28
<b>P.M. Peak Traffic Hour</b>								
North-South Road	5.7	4.6	3.4	4,622	7.65	2.02	1.63	1.20
East-West Road	2.2	1.9	1.6	3,593	7.65	0.60	0.52	0.44

<sup>1</sup> Methodology from Bay Area Air Quality Management District *BAAQMD CEQA Guidelines* (1996).

<sup>2</sup> Emission factors from EMFAC2002 (2003).

## Total Roadway CO Concentrations

$$\text{Peak Hour Emissions} = \text{North-South Concentration} + \text{East-West Concentration} + \text{Background 1-hour Concentration}^2$$

$$\text{8-Hour Emissions} = ((\text{Highest Peak Hour Concentration} - \text{Background 1-hour Concentration}) \times \text{Persistence Factor}) + \text{Background 8-hour Concentration}$$

	A.M. Peak Hour	P.M. Peak Hour	8-Hour
25 Feet from Roadway Edge	4.8	5.6	3.3
50 Feet from Roadway Edge	4.5	5.1	3.0
100 Feet from Roadway Edge	4.1	4.6	2.6

<sup>2</sup> Methodology from Bay Area Air Quality Management District *BAAQMD CEQA Guidelines* (1996).

# SIMPLIFIED CALINE4 CARBON MONOXIDE ANALYSIS

**Project Number:** 10953-00  
**Project Title:** City of Lake Forest Opportunities Study Program EIR

## Background Information

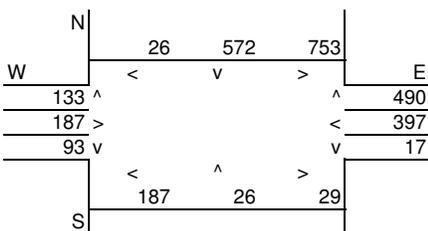
Nearest Air Monitoring Station measuring CO: Mission Viejo - 26081 Via Pera  
 Background 1-hour CO Concentration (ppm): 3.0  
 Background 8-hour CO Concentration (ppm): 1.5  
 Persistence Factor: 0.7  
 Analysis Year: 2004

## Roadway Data

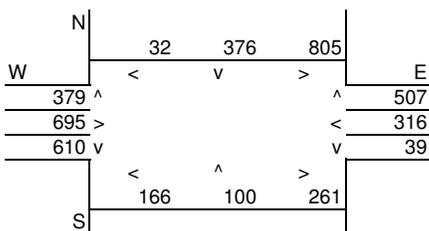
Intersection: Paseo De Valencia & Carlota  
 Analysis Condition: Existing Traffic Volumes

	Roadway Type	No. of Lanes	Average Speed		
			A.M.	P.M.	
North-South Roadway:	Paseo De Valencia	At Grade	8	20	20
East-West Roadway:	Carlota	At Grade	8	20	20

### A.M. Peak Hour Traffic Volumes



### P.M. Peak Hour Traffic Volumes



### Highest Traffic Volumes (Vehicles per Hour)

N-S Road:	2,000	N-S Road:	2,199
E-W Road:	1,873	E-W Road:	2,623

## Roadway CO Contributions and Concentrations

$$\text{Emissions} = (A \times B \times C) / 100,000^1$$

Roadway	A <sub>1</sub>	A <sub>2</sub>	A <sub>3</sub>	B	C	Estimated CO Concentrations		
	Reference CO Concentrations 25 Feet	50 Feet	100 Feet	Traffic Volume	Emission Factors <sup>2</sup>	25 Feet	50 Feet	100 Feet
<b>A.M. Peak Traffic Hour</b>								
North-South Road	5.7	4.6	3.4	2,000	7.65	0.87	0.70	0.52
East-West Road	2.2	1.9	1.6	1,873	7.65	0.32	0.27	0.23
<b>P.M. Peak Traffic Hour</b>								
North-South Road	2.2	1.9	1.6	2,199	7.65	0.37	0.32	0.27
East-West Road	5.7	4.6	3.4	2,623	7.65	1.14	0.92	0.68

<sup>1</sup> Methodology from Bay Area Air Quality Management District *BAAQMD CEQA Guidelines* (1996).

<sup>2</sup> Emission factors from EMFAC2002 (2003).

## Total Roadway CO Concentrations

$$\text{Peak Hour Emissions} = \text{North-South Concentration} + \text{East-West Concentration} + \text{Background 1-hour Concentration}^2$$

$$\text{8-Hour Emissions} = ((\text{Highest Peak Hour Concentration} - \text{Background 1-hour Concentration}) \times \text{Persistence Factor}) + \text{Background 8-hour Concentration}$$

	A.M. Peak Hour	P.M. Peak Hour	8-Hour
25 Feet from Roadway Edge	4.2	4.5	2.6
50 Feet from Roadway Edge	4.0	4.2	2.4
100 Feet from Roadway Edge	3.7	4.0	2.2

<sup>2</sup> Methodology from Bay Area Air Quality Management District *BAAQMD CEQA Guidelines* (1996).

# SIMPLIFIED CALINE4 CARBON MONOXIDE ANALYSIS

Project Number: 10953-00  
 Project Title: City of Lake Forest Opportunities Study Program EIR

## Background Information

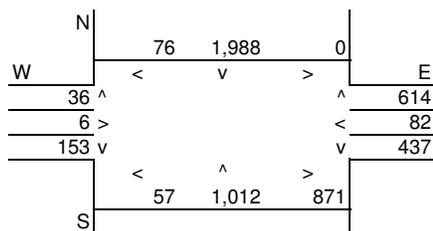
Nearest Air Monitoring Station measuring CO: Mission Viejo - 26081 Via Pera  
 Background 1-hour CO Concentration (ppm): 3.0  
 Background 8-hour CO Concentration (ppm): 1.5  
 Persistence Factor: 0.7  
 Analysis Year: 2004

## Roadway Data

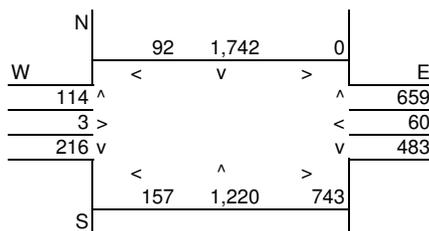
Intersection: El Toro & Bridger/I-5 NB  
 Analysis Condition: Existing Traffic Volumes

	Roadway Type	No. of Lanes	Average Speed		
			A.M.	P.M.	
North-South Roadway:	El Toro	At Grade	8	20	15
East-West Roadway:	Bridger/I-5 NB	At Grade	6	20	20

### A.M. Peak Hour Traffic Volumes



### P.M. Peak Hour Traffic Volumes



### Highest Traffic Volumes (Vehicles per Hour)

N-S Road: 4,518	N-S Road: 4,561
E-W Road: 2,010	E-W Road: 1,948

## Roadway CO Contributions and Concentrations

Emissions = (A x B x C) / 100,000<sup>1</sup>

Roadway	A <sub>1</sub>	A <sub>2</sub>	A <sub>3</sub>	B	C	Estimated CO Concentrations		
	Reference CO Concentrations 25 Feet	50 Feet	100 Feet	Traffic Volume	Emission Factors <sup>2</sup>	25 Feet	50 Feet	100 Feet
<b>A.M. Peak Traffic Hour</b>								
North-South Road	5.7	4.6	3.4	4,518	7.65	1.97	1.59	1.18
East-West Road	2.3	2.0	1.7	2,010	7.65	0.35	0.31	0.26
<b>P.M. Peak Traffic Hour</b>								
North-South Road	5.7	4.6	3.4	4,561	8.95	2.33	1.88	1.39
East-West Road	2.3	2.0	1.7	1,948	7.65	0.34	0.30	0.25

<sup>1</sup> Methodology from Bay Area Air Quality Management District *BAAQMD CEQA Guidelines* (1996).

<sup>2</sup> Emission factors from EMFAC2002 (2003).

## Total Roadway CO Concentrations

Peak Hour Emissions = North-South Concentration + East-West Concentration + Background 1-hour Concentration<sup>2</sup>

8-Hour Emissions = ((Highest Peak Hour Concentration - Background 1-hour Concentration) x Persistence Factor) + Background 8-hour Concentration

	A.M. Peak Hour	P.M. Peak Hour	8-Hour
25 Feet from Roadway Edge	5.3	5.7	3.4
50 Feet from Roadway Edge	4.9	5.2	3.0
100 Feet from Roadway Edge	4.4	4.6	2.6

<sup>2</sup> Methodology from Bay Area Air Quality Management District *BAAQMD CEQA Guidelines* (1996).

# SIMPLIFIED CALINE4 CARBON MONOXIDE ANALYSIS

Project Number: 10953-00  
 Project Title: City of Lake Forest Opportunities Study Program EIR

## Background Information

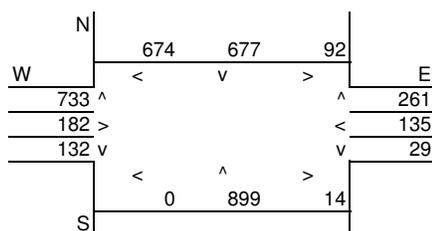
Nearest Air Monitoring Station measuring CO: Mission Viejo - 26081 Via Pera  
 Background 1-hour CO Concentration (ppm): 3.0  
 Background 8-hour CO Concentration (ppm): 1.5  
 Persistence Factor: 0.7  
 Analysis Year: 2004

## Roadway Data

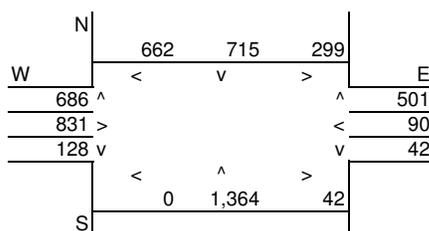
Intersection: El Toro & Avd Carlota  
 Analysis Condition: Existing Traffic Volumes

	Roadway Type	No. of Lanes	Average Speed		
			A.M.	P.M.	
North-South Roadway:	El Toro	At Grade	8	20	10
East-West Roadway:	Avd Carlota (a)	At Grade	8	20	10

### A.M. Peak Hour Traffic Volumes



### P.M. Peak Hour Traffic Volumes



### Highest Traffic Volumes (Vehicles per Hour)

N-S Road: 3,336	N-S Road: 4,227
E-W Road: 1,856	E-W Road: 2,397

## Roadway CO Contributions and Concentrations

$$\text{Emissions} = (A \times B \times C) / 100,000^1$$

Roadway	A <sub>1</sub>	A <sub>2</sub>	A <sub>3</sub>	B	C	Estimated CO Concentrations		
	Reference CO Concentrations 25 Feet	50 Feet	100 Feet	Traffic Volume	Emission Factors <sup>2</sup>	25 Feet	50 Feet	100 Feet
<b>A.M. Peak Traffic Hour</b>								
North-South Road	5.7	4.6	3.4	3,336	7.65	1.46	1.17	0.87
East-West Road	2.2	1.9	1.6	1,856	7.65	0.31	0.27	0.23
<b>P.M. Peak Traffic Hour</b>								
North-South Road	5.7	4.6	3.4	4,227	10.83	2.61	2.11	1.56
East-West Road	2.2	1.9	1.6	2,397	10.83	0.57	0.49	0.42

<sup>1</sup> Methodology from Bay Area Air Quality Management District *BAAQMD CEQA Guidelines* (1996).

<sup>2</sup> Emission factors from EMFAC2002 (2003).

## Total Roadway CO Concentrations

$$\text{Peak Hour Emissions} = \text{North-South Concentration} + \text{East-West Concentration} + \text{Background 1-hour Concentration}^2$$

$$\text{8-Hour Emissions} = ((\text{Highest Peak Hour Concentration} - \text{Background 1-hour Concentration}) \times \text{Persistence Factor}) + \text{Background 8-hour Concentration}$$

	A.M. Peak Hour	P.M. Peak Hour	8-Hour
25 Feet from Roadway Edge	4.8	6.2	3.7
50 Feet from Roadway Edge	4.4	5.6	3.3
100 Feet from Roadway Edge	4.1	5.0	2.9

<sup>2</sup> Methodology from Bay Area Air Quality Management District *BAAQMD CEQA Guidelines* (1996).



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**CO Analysis in Project Area—Existing General Plan Build-out**

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# SIMPLIFIED CALINE4 CARBON MONOXIDE ANALYSIS

Project Number: 10953-00  
 Project Title: City of Lake Forest Opportunities Study Program EIR

## Background Information

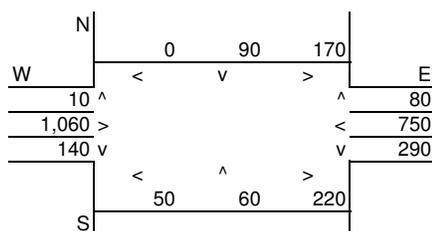
Nearest Air Monitoring Station measuring CO: Mission Viejo - 26081 Via Pera  
 Background 1-hour CO Concentration (ppm): 3.0  
 Background 8-hour CO Concentration (ppm): 1.5  
 Persistence Factor: 0.8  
 Analysis Year: 2030

## Roadway Data

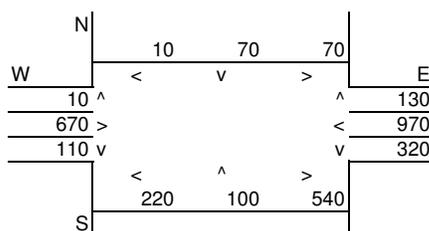
Intersection: Alton & Portola  
 Analysis Condition: Year 2030 Traffic Volumes - Existing General Plan

	Roadway Type	No. of Lanes	Average Speed		
			A.M.	P.M.	
North-South Roadway:	Alton	At Grade	8	20	20
East-West Roadway:	Portola	At Grade	8	20	20

### A.M. Peak Hour Traffic Volumes



### P.M. Peak Hour Traffic Volumes



### Highest Traffic Volumes (Vehicles per Hour)

N-S Road: 850  
 E-W Road: 2,570  
 N-S Road: 1,360  
 E-W Road: 2,700

## Roadway CO Contributions and Concentrations

$$\text{Emissions} = (A \times B \times C) / 100,000^1$$

Roadway	A <sub>1</sub>	A <sub>2</sub>	A <sub>3</sub>	B	C	Estimated CO Concentrations		
	Reference CO Concentrations 25 Feet	50 Feet	100 Feet	Traffic Volume	Emission Factors <sup>2</sup>	25 Feet	50 Feet	100 Feet
A.M. Peak Traffic Hour								
North-South Road	2.2	1.9	1.6	850	1.09	0.02	0.02	0.01
East-West Road	5.7	4.6	3.4	2,570	1.09	0.16	0.13	0.10
P.M. Peak Traffic Hour								
North-South Road	2.2	1.9	1.6	1,360	1.09	0.03	0.03	0.02
East-West Road	5.7	4.6	3.4	2,700	1.09	0.17	0.14	0.10

<sup>1</sup> Methodology from Bay Area Air Quality Management District *BAAQMD CEQA Guidelines* (1996).

<sup>2</sup> Emission factors from EMFAC2002 (2003).

## Total Roadway CO Concentrations

$$\text{Peak Hour Emissions} = \text{North-South Concentration} + \text{East-West Concentration} + \text{Background 1-hour Concentration}^2$$

$$\text{8-Hour Emissions} = ((\text{Highest Peak Hour Concentration} - \text{Background 1-hour Concentration}) \times \text{Persistence Factor}) + \text{Background 8-hour Concentration}$$

	A.M. Peak Hour	P.M. Peak Hour	8-Hour
25 Feet from Roadway Edge	3.2	3.2	1.7
50 Feet from Roadway Edge	3.1	3.2	1.6
100 Feet from Roadway Edge	3.1	3.1	1.6

<sup>2</sup> Methodology from Bay Area Air Quality Management District *BAAQMD CEQA Guidelines* (1996).

# SIMPLIFIED CALINE4 CARBON MONOXIDE ANALYSIS

Project Number: 10953-00  
 Project Title: City of Lake Forest Opportunities Study Program EIR

## Background Information

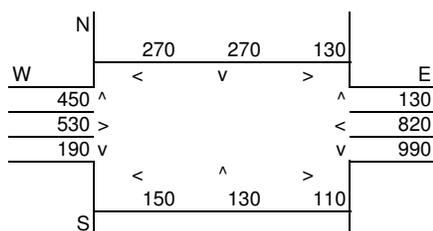
Nearest Air Monitoring Station measuring CO: Mission Viejo - 26081 Via Pera  
 Background 1-hour CO Concentration (ppm): 3.0  
 Background 8-hour CO Concentration (ppm): 1.5  
 Persistence Factor: 0.8  
 Analysis Year: 2030

## Roadway Data

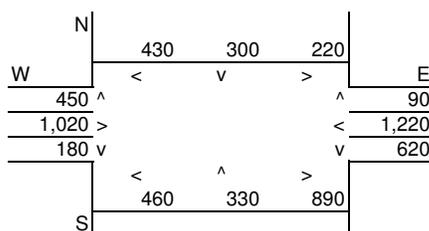
Intersection: Bake & Portola  
 Analysis Condition: Year 2030 Traffic Volumes - Existing General Plan

	Roadway Type	No. of Lanes	Average Speed		
			A.M.	P.M.	
North-South Roadway:	Bake	At Grade	8	20	5
East-West Roadway:	Portola	At Grade	8	20	5

### A.M. Peak Hour Traffic Volumes



### P.M. Peak Hour Traffic Volumes



### Highest Traffic Volumes (Vehicles per Hour)

N-S Road:	1,840	N-S Road:	2,780
E-W Road:	2,710	E-W Road:	4,060

## Roadway CO Contributions and Concentrations

$$\text{Emissions} = (A \times B \times C) / 100,000^1$$

Roadway	A <sub>1</sub>	A <sub>2</sub>	A <sub>3</sub>	B	C	Estimated CO Concentrations		
	Reference CO Concentrations 25 Feet	50 Feet	100 Feet	Traffic Volume	Emission Factors <sup>2</sup>	25 Feet	50 Feet	100 Feet
<b>A.M. Peak Traffic Hour</b>								
North-South Road	2.2	1.9	1.6	1,840	1.09	0.04	0.04	0.03
East-West Road	5.7	4.6	3.4	2,710	1.09	0.17	0.14	0.10
<b>P.M. Peak Traffic Hour</b>								
North-South Road	2.2	1.9	1.6	2,780	1.65	0.10	0.09	0.07
East-West Road	5.7	4.6	3.4	4,060	1.65	0.38	0.31	0.23

<sup>1</sup> Methodology from Bay Area Air Quality Management District *BAAQMD CEQA Guidelines* (1996).

<sup>2</sup> Emission factors from EMFAC2002 (2003).

## Total Roadway CO Concentrations

$$\text{Peak Hour Emissions} = \text{North-South Concentration} + \text{East-West Concentration} + \text{Background 1-hour Concentration}^2$$

$$\text{8-Hour Emissions} = ((\text{Highest Peak Hour Concentration} - \text{Background 1-hour Concentration}) \times \text{Persistence Factor}) + \text{Background 8-hour Concentration}$$

	A.M. Peak Hour	P.M. Peak Hour	8-Hour
25 Feet from Roadway Edge	3.2	3.5	1.9
50 Feet from Roadway Edge	3.2	3.4	1.8
100 Feet from Roadway Edge	3.1	3.3	1.7

<sup>2</sup> Methodology from Bay Area Air Quality Management District *BAAQMD CEQA Guidelines* (1996).

# SIMPLIFIED CALINE4 CARBON MONOXIDE ANALYSIS

**Project Number:** 10953-00  
**Project Title:** City of Lake Forest Opportunities Study Program EIR

## Background Information

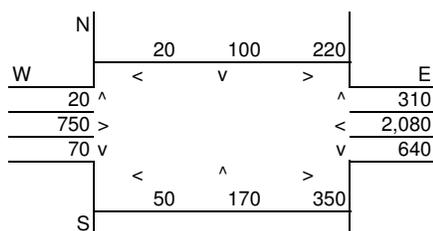
Nearest Air Monitoring Station measuring CO: Mission Viejo - 26081 Via Pera  
 Background 1-hour CO Concentration (ppm): 3.0  
 Background 8-hour CO Concentration (ppm): 1.5  
 Persistence Factor: 0.8  
 Analysis Year: 2030

## Roadway Data

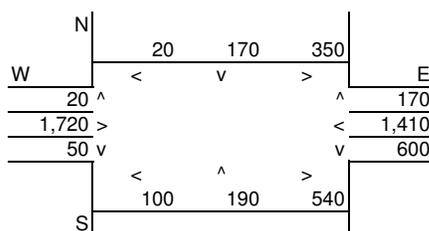
Intersection: Lake Forest & Portola  
 Analysis Condition: Year 2030 Traffic Volumes - Existing General Plan

	Roadway Type	No. of Lanes	Average Speed		
			A.M.	P.M.	
North-South Roadway:	Lake Forest	At Grade	8	20	10
East-West Roadway:	Portola	At Grade	8	20	10

### A.M. Peak Hour Traffic Volumes



### P.M. Peak Hour Traffic Volumes



### Highest Traffic Volumes (Vehicles per Hour)

N-S Road: 1,380                      N-S Road: 1,650  
 E-W Road: 4,350                      E-W Road: 4,790

## Roadway CO Contributions and Concentrations

$$\text{Emissions} = (A \times B \times C) / 100,000^1$$

Roadway	A <sub>1</sub>	A <sub>2</sub>	A <sub>3</sub>	B	C	Estimated CO Concentrations		
	Reference CO Concentrations 25 Feet	50 Feet	100 Feet	Traffic Volume	Emission Factors <sup>2</sup>	25 Feet	50 Feet	100 Feet
<b>A.M. Peak Traffic Hour</b>								
North-South Road	2.2	1.9	1.6	1,380	1.09	0.03	0.03	0.02
East-West Road	5.7	4.6	3.4	4,350	1.09	0.27	0.22	0.16
<b>P.M. Peak Traffic Hour</b>								
North-South Road	2.2	1.9	1.6	1,650	1.41	0.05	0.04	0.04
East-West Road	5.7	4.6	3.4	4,790	1.41	0.38	0.31	0.23

<sup>1</sup> Methodology from Bay Area Air Quality Management District *BAAQMD CEQA Guidelines* (1996).

<sup>2</sup> Emission factors from EMFAC2002 (2003).

## Total Roadway CO Concentrations

$$\text{Peak Hour Emissions} = \text{North-South Concentration} + \text{East-West Concentration} + \text{Background 1-hour Concentration}^2$$

$$\text{8-Hour Emissions} = ((\text{Highest Peak Hour Concentration} - \text{Background 1-hour Concentration}) \times \text{Persistence Factor}) + \text{Background 8-hour Concentration}$$

	A.M. Peak Hour	P.M. Peak Hour	8-Hour
25 Feet from Roadway Edge	3.3	3.4	1.8
50 Feet from Roadway Edge	3.2	3.4	1.8
100 Feet from Roadway Edge	3.2	3.3	1.7

<sup>2</sup> Methodology from Bay Area Air Quality Management District *BAAQMD CEQA Guidelines* (1996).

# SIMPLIFIED CALINE4 CARBON MONOXIDE ANALYSIS

**Project Number:** 10953-00  
**Project Title:** City of Lake Forest Opportunities Study Program EIR

## Background Information

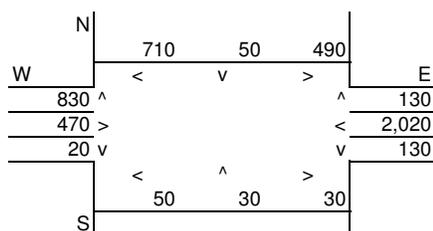
Nearest Air Monitoring Station measuring CO: Mission Viejo - 26081 Via Pera  
 Background 1-hour CO Concentration (ppm): 3.0  
 Background 8-hour CO Concentration (ppm): 1.5  
 Persistence Factor: 0.8  
 Analysis Year: 2030

## Roadway Data

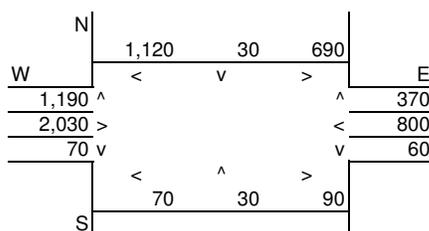
Intersection: Glenn Ranch & Portola  
 Analysis Condition: Year 2030 Traffic Volumes - Existing General Plan

	Roadway Type	No. of Lanes	Average Speed		
			A.M.	P.M.	
North-South Roadway:	Glenn Ranch	At Grade	8	15	20
East-West Roadway:	Portola	At Grade	8	15	20

### A.M. Peak Hour Traffic Volumes



### P.M. Peak Hour Traffic Volumes



### Highest Traffic Volumes (Vehicles per Hour)

N-S Road:	2,240	N-S Road:	3,430
E-W Road:	4,100	E-W Road:	5,280

## Roadway CO Contributions and Concentrations

$$\text{Emissions} = (A \times B \times C) / 100,000^1$$

Roadway	A <sub>1</sub>	A <sub>2</sub>	A <sub>3</sub>	B	C	Estimated CO Concentrations		
	Reference CO Concentrations 25 Feet	50 Feet	100 Feet	Traffic Volume	Emission Factors <sup>2</sup>	25 Feet	50 Feet	100 Feet
<b>A.M. Peak Traffic Hour</b>								
North-South Road	2.2	1.9	1.6	2,240	1.23	0.06	0.05	0.04
East-West Road	5.7	4.6	3.4	4,100	1.23	0.29	0.23	0.17
<b>P.M. Peak Traffic Hour</b>								
North-South Road	2.2	1.9	1.6	3,430	1.09	0.08	0.07	0.06
East-West Road	5.7	4.6	3.4	5,280	1.09	0.33	0.26	0.20

<sup>1</sup> Methodology from Bay Area Air Quality Management District *BAAQMD CEQA Guidelines* (1996).

<sup>2</sup> Emission factors from EMFAC2002 (2003).

## Total Roadway CO Concentrations

$$\text{Peak Hour Emissions} = \text{North-South Concentration} + \text{East-West Concentration} + \text{Background 1-hour Concentration}^2$$

$$\text{8-Hour Emissions} = ((\text{Highest Peak Hour Concentration} - \text{Background 1-hour Concentration}) \times \text{Persistence Factor}) + \text{Background 8-hour Concentration}$$

	A.M. Peak Hour	P.M. Peak Hour	8-Hour
25 Feet from Roadway Edge	3.3	3.4	1.8
50 Feet from Roadway Edge	3.3	3.3	1.8
100 Feet from Roadway Edge	3.2	3.3	1.7

<sup>2</sup> Methodology from Bay Area Air Quality Management District *BAAQMD CEQA Guidelines* (1996).

# SIMPLIFIED CALINE4 CARBON MONOXIDE ANALYSIS

Project Number: 10953-00  
 Project Title: City of Lake Forest Opportunities Study Program EIR

## Background Information

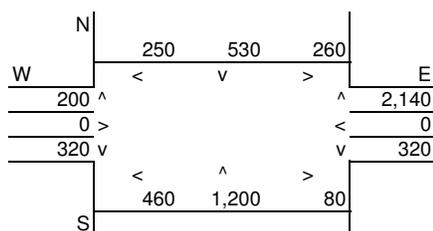
Nearest Air Monitoring Station measuring CO: Mission Viejo - 26081 Via Pera  
 Background 1-hour CO Concentration (ppm): 3.0  
 Background 8-hour CO Concentration (ppm): 1.5  
 Persistence Factor: 0.8  
 Analysis Year: 2030

## Roadway Data

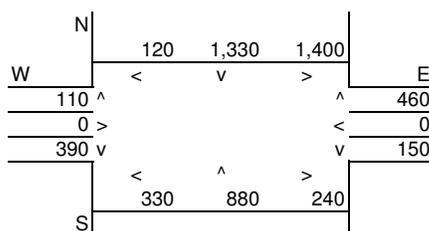
Intersection: Portola & SR-241 Ramps  
 Analysis Condition: Year 2030 Traffic Volumes - Existing General Plan

	Roadway Type	No. of Lanes	Average Speed		
			A.M.	P.M.	
North-South Roadway:	Portola	At Grade	8	20	20
East-West Roadway:	SR-241 Ramps	At Grade	4	20	20

### A.M. Peak Hour Traffic Volumes



### P.M. Peak Hour Traffic Volumes



### Highest Traffic Volumes (Vehicles per Hour)

N-S Road:	4,580	N-S Road:	4,300
E-W Road:	2,800	E-W Road:	2,250

## Roadway CO Contributions and Concentrations

Emissions = (A x B x C) / 100,000<sup>1</sup>

Roadway	A <sub>1</sub>	A <sub>2</sub>	A <sub>3</sub>	B	C	Estimated CO Concentrations		
	Reference CO Concentrations 25 Feet	Reference CO Concentrations 50 Feet	Reference CO Concentrations 100 Feet	Traffic Volume	Emission Factors <sup>2</sup>	25 Feet	50 Feet	100 Feet
A.M. Peak Traffic Hour								
North-South Road	5.7	4.6	3.4	4,580	1.09	0.28	0.23	0.17
East-West Road	2.6	2.2	1.7	2,800	1.09	0.08	0.07	0.05
P.M. Peak Traffic Hour								
North-South Road	5.7	4.6	3.4	4,300	1.09	0.27	0.22	0.16
East-West Road	2.6	2.2	1.7	2,250	1.09	0.06	0.05	0.04

<sup>1</sup> Methodology from Bay Area Air Quality Management District *BAAQMD CEQA Guidelines* (1996).

<sup>2</sup> Emission factors from EMFAC2002 (2003).

## Total Roadway CO Concentrations

Peak Hour Emissions = North-South Concentration + East-West Concentration + Background 1-hour Concentration<sup>2</sup>

8-Hour Emissions = ((Highest Peak Hour Concentration - Background 1-hour Concentration) x Persistence Factor) + Background 8-hour Concentration

	A.M. Peak Hour	P.M. Peak Hour	8-Hour
25 Feet from Roadway Edge	3.4	3.3	1.8
50 Feet from Roadway Edge	3.3	3.3	1.7
100 Feet from Roadway Edge	3.2	3.2	1.7

<sup>2</sup> Methodology from Bay Area Air Quality Management District *BAAQMD CEQA Guidelines* (1996).

# SIMPLIFIED CALINE4 CARBON MONOXIDE ANALYSIS

Project Number: 10953-00  
 Project Title: City of Lake Forest Opportunities Study Program EIR

## Background Information

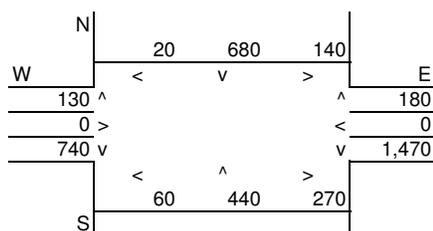
Nearest Air Monitoring Station measuring CO: Mission Viejo - 26081 Via Pera  
 Background 1-hour CO Concentration (ppm): 3.0  
 Background 8-hour CO Concentration (ppm): 1.5  
 Persistence Factor: 0.8  
 Analysis Year: 2030

## Roadway Data

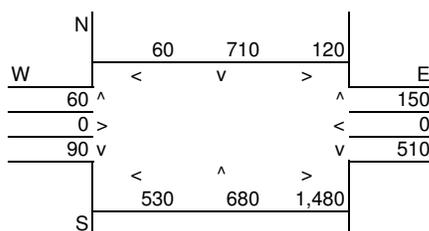
Intersection: Alton & SR-241 Ramps  
 Analysis Condition: Year 2030 Traffic Volumes - Existing General Plan

	Roadway Type	No. of Lanes	Average Speed		
			A.M.	P.M.	
North-South Roadway:	Alton	At Grade	8	20	20
East-West Roadway:	SR-241 Ramps	At Grade	4	20	20

### A.M. Peak Hour Traffic Volumes



### P.M. Peak Hour Traffic Volumes



### Highest Traffic Volumes (Vehicles per Hour)

N-S Road: 3,660                      N-S Road: 4,000  
 E-W Road: 2,060                      E-W Road: 2,260

## Roadway CO Contributions and Concentrations

$$\text{Emissions} = (A \times B \times C) / 100,000^1$$

Roadway	A <sub>1</sub>	A <sub>2</sub>	A <sub>3</sub>	B	C	Estimated CO Concentrations		
	Reference CO Concentrations 25 Feet	50 Feet	100 Feet	Traffic Volume	Emission Factors <sup>2</sup>	25 Feet	50 Feet	100 Feet
<b>A.M. Peak Traffic Hour</b>								
North-South Road	5.7	4.6	3.4	3,660	1.09	0.23	0.18	0.14
East-West Road	2.6	2.2	1.7	2,060	1.09	0.06	0.05	0.04
<b>P.M. Peak Traffic Hour</b>								
North-South Road	5.7	4.6	3.4	4,000	1.09	0.25	0.20	0.15
East-West Road	2.6	2.2	1.7	2,260	1.09	0.06	0.05	0.04

<sup>1</sup> Methodology from Bay Area Air Quality Management District *BAAQMD CEQA Guidelines* (1996).

<sup>2</sup> Emission factors from EMFAC2002 (2003).

## Total Roadway CO Concentrations

$$\text{Peak Hour Emissions} = \text{North-South Concentration} + \text{East-West Concentration} + \text{Background 1-hour Concentration}^2$$

$$\text{8-Hour Emissions} = ((\text{Highest Peak Hour Concentration} - \text{Background 1-hour Concentration}) \times \text{Persistence Factor}) + \text{Background 8-hour Concentration}$$

	A.M. Peak Hour	P.M. Peak Hour	8-Hour
25 Feet from Roadway Edge	3.3	3.3	1.8
50 Feet from Roadway Edge	3.2	3.3	1.7
100 Feet from Roadway Edge	3.2	3.2	1.7

<sup>2</sup> Methodology from Bay Area Air Quality Management District *BAAQMD CEQA Guidelines* (1996).

# SIMPLIFIED CALINE4 CARBON MONOXIDE ANALYSIS

**Project Number:** 10953-00  
**Project Title:** City of Lake Forest Opportunities Study Program EIR

## Background Information

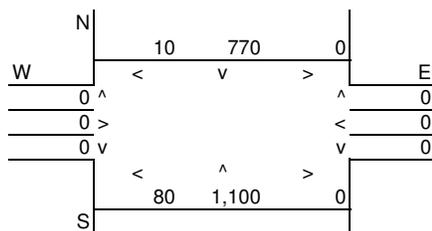
Nearest Air Monitoring Station measuring CO: Mission Viejo - 26081 Via Pera  
 Background 1-hour CO Concentration (ppm): 3.0  
 Background 8-hour CO Concentration (ppm): 1.5  
 Persistence Factor: 0.8  
 Analysis Year: 2030

## Roadway Data

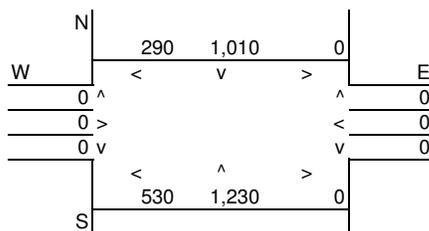
Intersection: Lake Forest & SR-241 NB  
 Analysis Condition: Year 2030 Traffic Volumes - Existing General Plan

	Roadway Type	No. of Lanes	Average Speed		
			A.M.	P.M.	
North-South Roadway:	Lake Forest	At Grade	8	20	20
East-West Roadway:	SR-241 NB	At Grade	2	20	20

### A.M. Peak Hour Traffic Volumes



### P.M. Peak Hour Traffic Volumes



### Highest Traffic Volumes (Vehicles per Hour)

N-S Road:	1,950	N-S Road:	2,770
E-W Road:	90	E-W Road:	820

## Roadway CO Contributions and Concentrations

Emissions = (A x B x C) / 100,000<sup>1</sup>

Roadway	A <sub>1</sub>	A <sub>2</sub>	A <sub>3</sub>	B	C	Estimated CO Concentrations		
	Reference CO Concentrations 25 Feet	50 Feet	100 Feet	Traffic Volume	Emission Factors <sup>2</sup>	25 Feet	50 Feet	100 Feet
<b>A.M. Peak Traffic Hour</b>								
North-South Road	5.7	4.6	3.4	1,950	1.09	0.12	0.10	0.07
East-West Road	2.7	2.2	1.7	90	1.09	0.00	0.00	0.00
<b>P.M. Peak Traffic Hour</b>								
North-South Road	5.7	4.6	3.4	2,770	1.09	0.17	0.14	0.10
East-West Road	2.7	2.2	1.7	820	1.09	0.02	0.02	0.02

<sup>1</sup> Methodology from Bay Area Air Quality Management District *BAAQMD CEQA Guidelines* (1996).

<sup>2</sup> Emission factors from EMFAC2002 (2003).

## Total Roadway CO Concentrations

Peak Hour Emissions = North-South Concentration + East-West Concentration + Background 1-hour Concentration<sup>2</sup>

8-Hour Emissions = ((Highest Peak Hour Concentration - Background 1-hour Concentration) x Persistence Factor) + Background 8-hour Concentration

	A.M. Peak Hour	P.M. Peak Hour	8-Hour
25 Feet from Roadway Edge	3.1	3.2	1.7
50 Feet from Roadway Edge	3.1	3.2	1.6
100 Feet from Roadway Edge	3.1	3.1	1.6

<sup>2</sup> Methodology from Bay Area Air Quality Management District *BAAQMD CEQA Guidelines* (1996).

# SIMPLIFIED CALINE4 CARBON MONOXIDE ANALYSIS

Project Number: 10953-00  
 Project Title: City of Lake Forest Opportunities Study Program EIR

## Background Information

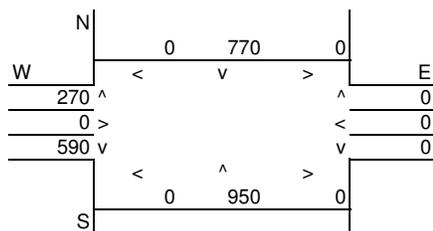
Nearest Air Monitoring Station measuring CO: Mission Viejo - 26081 Via Pera  
 Background 1-hour CO Concentration (ppm): 3.0  
 Background 8-hour CO Concentration (ppm): 1.5  
 Persistence Factor: 0.8  
 Analysis Year: 2030

## Roadway Data

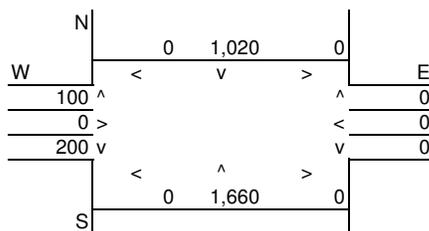
Intersection: Lake Forest & SR-241 SB  
 Analysis Condition: Year 2030 Traffic Volumes - Existing General Plan

	Roadway Type	No. of Lanes	Average Speed		
			A.M.	P.M.	
North-South Roadway:	Lake Forest	At Grade	4	20	20
East-West Roadway:	SR-241 SB	At Grade	4	20	20

### A.M. Peak Hour Traffic Volumes



### P.M. Peak Hour Traffic Volumes



### Highest Traffic Volumes (Vehicles per Hour)

N-S Road:	2,310	N-S Road:	2,880
E-W Road:	860	E-W Road:	300

## Roadway CO Contributions and Concentrations

Emissions = (A x B x C) / 100,000<sup>1</sup>

Roadway	A <sub>1</sub>	A <sub>2</sub>	A <sub>3</sub>	B	C	Estimated CO Concentrations		
	Reference CO Concentrations 25 Feet	50 Feet	100 Feet	Traffic Volume	Emission Factors <sup>2</sup>	25 Feet	50 Feet	100 Feet
<b>A.M. Peak Traffic Hour</b>								
North-South Road	7.0	5.4	3.8	2,310	1.09	0.18	0.14	0.10
East-West Road	2.6	2.2	1.7	860	1.09	0.02	0.02	0.02
<b>P.M. Peak Traffic Hour</b>								
North-South Road	7.0	5.4	3.8	2,880	1.09	0.22	0.17	0.12
East-West Road	2.6	2.2	1.7	300	1.09	0.01	0.01	0.01

<sup>1</sup> Methodology from Bay Area Air Quality Management District *BAAQMD CEQA Guidelines* (1996).

<sup>2</sup> Emission factors from EMFAC2002 (2003).

## Total Roadway CO Concentrations

Peak Hour Emissions = North-South Concentration + East-West Concentration + Background 1-hour Concentration<sup>2</sup>

8-Hour Emissions = ((Highest Peak Hour Concentration - Background 1-hour Concentration) x Persistence Factor) + Background 8-hour Concentration

	A.M. Peak Hour	P.M. Peak Hour	8-Hour
25 Feet from Roadway Edge	3.2	3.2	1.7
50 Feet from Roadway Edge	3.2	3.2	1.6
100 Feet from Roadway Edge	3.1	3.1	1.6

<sup>2</sup> Methodology from Bay Area Air Quality Management District *BAAQMD CEQA Guidelines* (1996).



# SIMPLIFIED CALINE4 CARBON MONOXIDE ANALYSIS

**Project Number:** 10953-00  
**Project Title:** City of Lake Forest Opportunities Study Program EIR

## Background Information

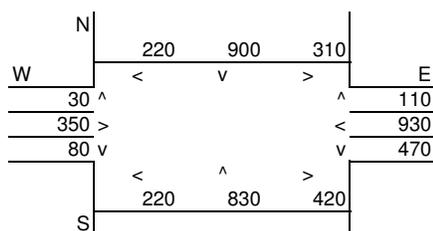
Nearest Air Monitoring Station measuring CO: Mission Viejo - 26081 Via Pera  
 Background 1-hour CO Concentration (ppm): 3.0  
 Background 8-hour CO Concentration (ppm): 1.5  
 Persistence Factor: 0.8  
 Analysis Year: 2030

## Roadway Data

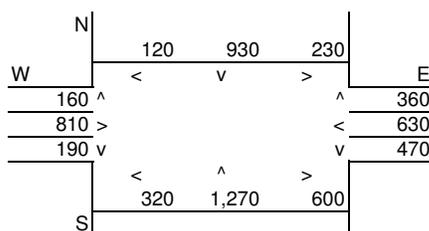
Intersection: Lake Forest & Rancho  
 Analysis Condition: Year 2030 Traffic Volumes - Existing General Plan

	Roadway Type	No. of Lanes	Average Speed		
			A.M.	P.M.	
North-South Roadway:	Lake Forest	At Grade	8	10	5
East-West Roadway:	Rancho	At Grade	8	10	5

### A.M. Peak Hour Traffic Volumes



### P.M. Peak Hour Traffic Volumes



### Highest Traffic Volumes (Vehicles per Hour)

N-S Road: 2,920                      N-S Road: 3,780  
 E-W Road: 2,590                      E-W Road: 3,100

## Roadway CO Contributions and Concentrations

$$\text{Emissions} = (A \times B \times C) / 100,000^1$$

Roadway	Reference CO Concentrations			B Traffic Volume	C Emission Factors <sup>2</sup>	Estimated CO Concentrations		
	A <sub>1</sub> 25 Feet	A <sub>2</sub> 50 Feet	A <sub>3</sub> 100 Feet			25 Feet	50 Feet	100 Feet
<b>A.M. Peak Traffic Hour</b>								
North-South Road	5.7	4.6	3.4	2,920	1.41	0.23	0.19	0.14
East-West Road	2.2	1.9	1.6	2,590	1.41	0.08	0.07	0.06
<b>P.M. Peak Traffic Hour</b>								
North-South Road	5.7	4.6	3.4	3,780	1.65	0.36	0.29	0.21
East-West Road	2.2	1.9	1.6	3,100	1.65	0.11	0.10	0.08

<sup>1</sup> Methodology from Bay Area Air Quality Management District *BAAQMD CEQA Guidelines* (1996).

<sup>2</sup> Emission factors from EMFAC2002 (2003).

## Total Roadway CO Concentrations

$$\text{Peak Hour Emissions} = \text{North-South Concentration} + \text{East-West Concentration} + \text{Background 1-hour Concentration}^2$$

$$\text{8-Hour Emissions} = ((\text{Highest Peak Hour Concentration} - \text{Background 1-hour Concentration}) \times \text{Persistence Factor}) + \text{Background 8-hour Concentration}$$

	A.M. Peak Hour	P.M. Peak Hour	8-Hour
25 Feet from Roadway Edge	3.3	3.5	1.9
50 Feet from Roadway Edge	3.3	3.4	1.8
100 Feet from Roadway Edge	3.2	3.3	1.7

<sup>2</sup> Methodology from Bay Area Air Quality Management District *BAAQMD CEQA Guidelines* (1996).

# SIMPLIFIED CALINE4 CARBON MONOXIDE ANALYSIS

Project Number: 10953-00  
 Project Title: City of Lake Forest Opportunities Study Program EIR

## Background Information

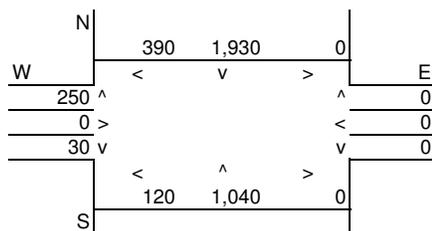
Nearest Air Monitoring Station measuring CO: Mission Viejo - 26081 Via Pera  
 Background 1-hour CO Concentration (ppm): 3.0  
 Background 8-hour CO Concentration (ppm): 1.5  
 Persistence Factor: 0.8  
 Analysis Year: 2030

## Roadway Data

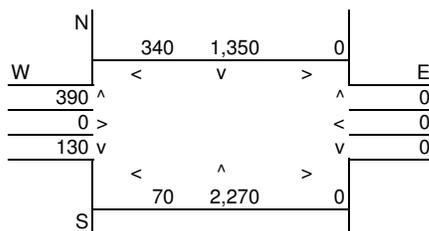
Intersection: Bake & Rancho South  
 Analysis Condition: Year 2030 Traffic Volumes - Existing General Plan

	Roadway Type	No. of Lanes	Average Speed		
			A.M.	P.M.	
North-South Roadway:	Bake	At Grade	6	20	15
East-West Roadway:	Rancho South	At Grade	4	20	15

### A.M. Peak Hour Traffic Volumes



### P.M. Peak Hour Traffic Volumes



### Highest Traffic Volumes (Vehicles per Hour)

N-S Road:	3,610	N-S Road:	4,350
E-W Road:	790	E-W Road:	930

## Roadway CO Contributions and Concentrations

$$\text{Emissions} = (A \times B \times C) / 100,000^1$$

Roadway	A <sub>1</sub>	A <sub>2</sub>	A <sub>3</sub>	B	C	Estimated CO Concentrations		
	Reference CO Concentrations 25 Feet	50 Feet	100 Feet	Traffic Volume	Emission Factors <sup>2</sup>	25 Feet	50 Feet	100 Feet
<b>A.M. Peak Traffic Hour</b>								
North-South Road	6.1	4.9	3.5	3,610	1.09	0.24	0.19	0.14
East-West Road	2.6	2.2	1.7	790	1.09	0.02	0.02	0.01
<b>P.M. Peak Traffic Hour</b>								
North-South Road	6.1	4.9	3.5	4,350	1.23	0.33	0.26	0.19
East-West Road	2.6	2.2	1.7	930	1.23	0.03	0.03	0.02

<sup>1</sup> Methodology from Bay Area Air Quality Management District *BAAQMD CEQA Guidelines* (1996).

<sup>2</sup> Emission factors from EMFAC2002 (2003).

## Total Roadway CO Concentrations

$$\text{Peak Hour Emissions} = \text{North-South Concentration} + \text{East-West Concentration} + \text{Background 1-hour Concentration}^2$$

$$\text{8-Hour Emissions} = ((\text{Highest Peak Hour Concentration} - \text{Background 1-hour Concentration}) \times \text{Persistence Factor}) + \text{Background 8-hour Concentration}$$

	A.M. Peak Hour	P.M. Peak Hour	8-Hour
25 Feet from Roadway Edge	3.3	3.4	1.8
50 Feet from Roadway Edge	3.2	3.3	1.7
100 Feet from Roadway Edge	3.2	3.2	1.7

<sup>2</sup> Methodology from Bay Area Air Quality Management District *BAAQMD CEQA Guidelines* (1996).

# SIMPLIFIED CALINE4 CARBON MONOXIDE ANALYSIS

**Project Number:** 10953-00  
**Project Title:** City of Lake Forest Opportunities Study Program EIR

## Background Information

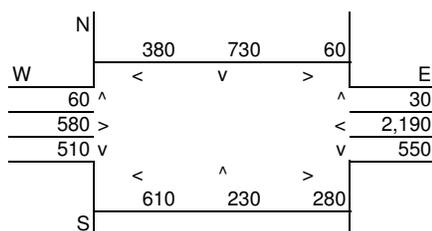
Nearest Air Monitoring Station measuring CO: Mission Viejo - 26081 Via Pera  
 Background 1-hour CO Concentration (ppm): 3.0  
 Background 8-hour CO Concentration (ppm): 1.5  
 Persistence Factor: 0.8  
 Analysis Year: 2030

## Roadway Data

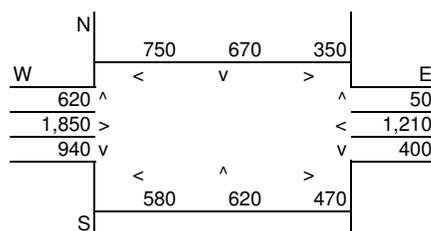
Intersection: El Toro & Portola/Santa Margarita  
 Analysis Condition: Year 2030 Traffic Volumes - Existing General Plan

	Roadway Type	No. of Lanes	Average Speed		
			A.M.	P.M.	
North-South Roadway:	El Toro	At Grade	8	10	5
East-West Roadway:	Portola/Santa Margarita	At Grade	8	10	5

### A.M. Peak Hour Traffic Volumes



### P.M. Peak Hour Traffic Volumes



### Highest Traffic Volumes (Vehicles per Hour)

N-S Road: 2,910  
 E-W Road: 4,330

N-S Road: 3,680  
 E-W Road: 5,950

## Roadway CO Contributions and Concentrations

$$\text{Emissions} = (A \times B \times C) / 100,000^1$$

Roadway	A <sub>1</sub>	A <sub>2</sub>	A <sub>3</sub>	B	C	Estimated CO Concentrations		
	Reference CO Concentrations 25 Feet	50 Feet	100 Feet	Traffic Volume	Emission Factors <sup>2</sup>	25 Feet	50 Feet	100 Feet
<b>A.M. Peak Traffic Hour</b>								
North-South Road	2.2	1.9	1.6	2,910	1.41	0.09	0.08	0.07
East-West Road	5.7	4.6	3.4	4,330	1.41	0.35	0.28	0.21
<b>P.M. Peak Traffic Hour</b>								
North-South Road	2.2	1.9	1.6	3,680	1.65	0.13	0.12	0.10
East-West Road	5.7	4.6	3.4	5,950	1.65	0.56	0.45	0.33

<sup>1</sup> Methodology from Bay Area Air Quality Management District *BAAQMD CEQA Guidelines* (1996).

<sup>2</sup> Emission factors from EMFAC2002 (2003).

## Total Roadway CO Concentrations

$$\text{Peak Hour Emissions} = \text{North-South Concentration} + \text{East-West Concentration} + \text{Background 1-hour Concentration}^2$$

$$\text{8-Hour Emissions} = ((\text{Highest Peak Hour Concentration} - \text{Background 1-hour Concentration}) \times \text{Persistence Factor}) + \text{Background 8-hour Concentration}$$

	A.M. Peak Hour	P.M. Peak Hour	8-Hour
25 Feet from Roadway Edge	3.4	3.7	2.1
50 Feet from Roadway Edge	3.4	3.6	2.0
100 Feet from Roadway Edge	3.3	3.4	1.8

<sup>2</sup> Methodology from Bay Area Air Quality Management District *BAAQMD CEQA Guidelines* (1996).

# SIMPLIFIED CALINE4 CARBON MONOXIDE ANALYSIS

Project Number: 10953-00  
 Project Title: City of Lake Forest Opportunities Study Program EIR

## Background Information

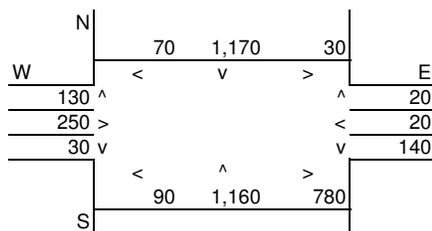
Nearest Air Monitoring Station measuring CO: Mission Viejo - 26081 Via Pera  
 Background 1-hour CO Concentration (ppm): 3.0  
 Background 8-hour CO Concentration (ppm): 1.5  
 Persistence Factor: 0.8  
 Analysis Year: 2030

## Roadway Data

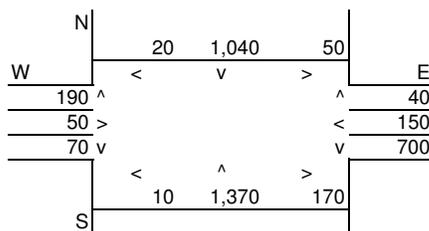
Intersection: Bake & Commercentre  
 Analysis Condition: Year 2030 Traffic Volumes - Existing General Plan

	Roadway Type	No. of Lanes	Average Speed		
			A.M.	P.M.	
North-South Roadway:	Bake	At Grade	8	20	20
East-West Roadway:	Commercentre	At Grade	6	20	20

### A.M. Peak Hour Traffic Volumes



### P.M. Peak Hour Traffic Volumes



### Highest Traffic Volumes (Vehicles per Hour)

N-S Road: 3,370  
 E-W Road: 1,240

N-S Road: 3,360  
 E-W Road: 1,160

## Roadway CO Contributions and Concentrations

$$\text{Emissions} = (A \times B \times C) / 100,000^1$$

Roadway	A <sub>1</sub>	A <sub>2</sub>	A <sub>3</sub>	B	C	Estimated CO Concentrations		
	Reference CO Concentrations 25 Feet	50 Feet	100 Feet	Traffic Volume	Emission Factors <sup>2</sup>	25 Feet	50 Feet	100 Feet
A.M. Peak Traffic Hour								
North-South Road	5.7	4.6	3.4	3,370	1.09	0.21	0.17	0.12
East-West Road	2.3	2.0	1.7	1,240	1.09	0.03	0.03	0.02
P.M. Peak Traffic Hour								
North-South Road	5.7	4.6	3.4	3,360	1.09	0.21	0.17	0.12
East-West Road	2.3	2.0	1.7	1,160	1.09	0.03	0.03	0.02

<sup>1</sup> Methodology from Bay Area Air Quality Management District *BAAQMD CEQA Guidelines* (1996).

<sup>2</sup> Emission factors from EMFAC2002 (2003).

## Total Roadway CO Concentrations

$$\text{Peak Hour Emissions} = \text{North-South Concentration} + \text{East-West Concentration} + \text{Background 1-hour Concentration}^2$$

$$\text{8-Hour Emissions} = ((\text{Highest Peak Hour Concentration} - \text{Background 1-hour Concentration}) \times \text{Persistence Factor}) + \text{Background 8-hour Concentration}$$

	A.M. Peak Hour	P.M. Peak Hour	8-Hour
25 Feet from Roadway Edge	3.2	3.2	1.7
50 Feet from Roadway Edge	3.2	3.2	1.7
100 Feet from Roadway Edge	3.1	3.1	1.6

<sup>2</sup> Methodology from Bay Area Air Quality Management District *BAAQMD CEQA Guidelines* (1996).

# SIMPLIFIED CALINE4 CARBON MONOXIDE ANALYSIS

Project Number: 10953-00  
 Project Title: City of Lake Forest Opportunities Study Program EIR

## Background Information

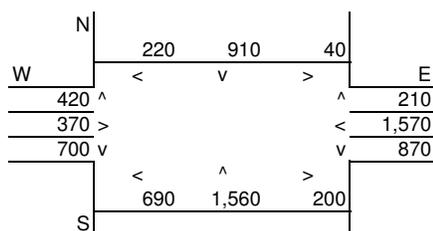
Nearest Air Monitoring Station measuring CO: Mission Viejo - 26081 Via Pera  
 Background 1-hour CO Concentration (ppm): 3.0  
 Background 8-hour CO Concentration (ppm): 1.5  
 Persistence Factor: 0.8  
 Analysis Year: 2030

## Roadway Data

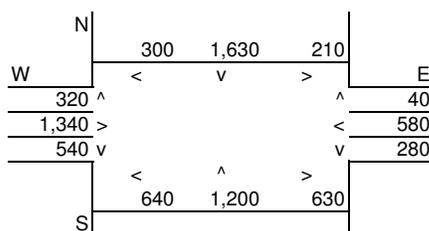
Intersection: Bake & Irvine/Trabuco  
 Analysis Condition: Year 2030 Traffic Volumes - Existing General Plan

	Roadway Type	No. of Lanes	Average Speed		
			A.M.	P.M.	
North-South Roadway:	Bake	At Grade	8	5	5
East-West Roadway:	Irvine/Trabuco	At Grade	8	5	5

### A.M. Peak Hour Traffic Volumes



### P.M. Peak Hour Traffic Volumes



### Highest Traffic Volumes (Vehicles per Hour)

N-S Road: 4,930                      N-S Road: 4,920  
 E-W Road: 3,970                      E-W Road: 3,720

## Roadway CO Contributions and Concentrations

$$\text{Emissions} = (A \times B \times C) / 100,000^1$$

Roadway	A <sub>1</sub>	A <sub>2</sub>	A <sub>3</sub>	B	C	Estimated CO Concentrations		
	Reference CO Concentrations 25 Feet	50 Feet	100 Feet	Traffic Volume	Emission Factors <sup>2</sup>	25 Feet	50 Feet	100 Feet
<b>A.M. Peak Traffic Hour</b>								
North-South Road	5.7	4.6	3.4	4,930	1.65	0.46	0.37	0.28
East-West Road	2.2	1.9	1.6	3,970	1.65	0.14	0.12	0.10
<b>P.M. Peak Traffic Hour</b>								
North-South Road	5.7	4.6	3.4	4,920	1.65	0.46	0.37	0.28
East-West Road	2.2	1.9	1.6	3,720	1.65	0.14	0.12	0.10

<sup>1</sup> Methodology from Bay Area Air Quality Management District *BAAQMD CEQA Guidelines* (1996).

<sup>2</sup> Emission factors from EMFAC2002 (2003).

## Total Roadway CO Concentrations

$$\text{Peak Hour Emissions} = \text{North-South Concentration} + \text{East-West Concentration} + \text{Background 1-hour Concentration}^2$$

$$\text{8-Hour Emissions} = ((\text{Highest Peak Hour Concentration} - \text{Background 1-hour Concentration}) \times \text{Persistence Factor}) + \text{Background 8-hour Concentration}$$

	A.M. Peak Hour	P.M. Peak Hour	8-Hour
25 Feet from Roadway Edge	3.6	3.6	2.0
50 Feet from Roadway Edge	3.5	3.5	1.9
100 Feet from Roadway Edge	3.4	3.4	1.8

<sup>2</sup> Methodology from Bay Area Air Quality Management District *BAAQMD CEQA Guidelines* (1996).

# SIMPLIFIED CALINE4 CARBON MONOXIDE ANALYSIS

Project Number: 10953-00  
 Project Title: City of Lake Forest Opportunities Study Program EIR

## Background Information

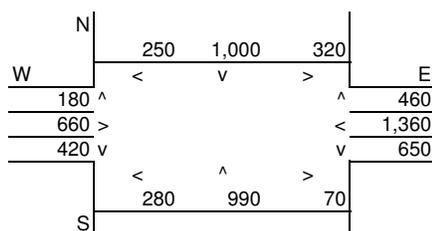
Nearest Air Monitoring Station measuring CO: Mission Viejo - 26081 Via Pera  
 Background 1-hour CO Concentration (ppm): 3.0  
 Background 8-hour CO Concentration (ppm): 1.5  
 Persistence Factor: 0.8  
 Analysis Year: 2030

## Roadway Data

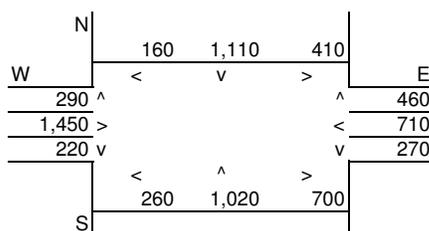
Intersection: Lake Forest & Trabuco  
 Analysis Condition: Year 2030 Traffic Volumes - Existing General Plan

	Roadway Type	No. of Lanes	Average Speed		
			A.M.	P.M.	
North-South Roadway:	Lake Forest	At Grade	8	20	15
East-West Roadway:	Trabuco	At Grade	8	20	15

### A.M. Peak Hour Traffic Volumes



### P.M. Peak Hour Traffic Volumes



### Highest Traffic Volumes (Vehicles per Hour)

N-S Road: 3,410                      N-S Road: 3,580  
 E-W Road: 3,520                      E-W Road: 4,000

## Roadway CO Contributions and Concentrations

$$\text{Emissions} = (A \times B \times C) / 100,000^1$$

Roadway	Reference CO Concentrations			B Traffic Volume	C Emission Factors <sup>2</sup>	Estimated CO Concentrations		
	A <sub>1</sub> 25 Feet	A <sub>2</sub> 50 Feet	A <sub>3</sub> 100 Feet			25 Feet	50 Feet	100 Feet
A.M. Peak Traffic Hour								
North-South Road	2.2	1.9	1.6	3,410	1.09	0.08	0.07	0.06
East-West Road	5.7	4.6	3.4	3,520	1.09	0.22	0.18	0.13
P.M. Peak Traffic Hour								
North-South Road	2.2	1.9	1.6	3,580	1.23	0.10	0.08	0.07
East-West Road	5.7	4.6	3.4	4,000	1.23	0.28	0.23	0.17

<sup>1</sup> Methodology from Bay Area Air Quality Management District *BAAQMD CEQA Guidelines* (1996).

<sup>2</sup> Emission factors from EMFAC2002 (2003).

## Total Roadway CO Concentrations

$$\text{Peak Hour Emissions} = \text{North-South Concentration} + \text{East-West Concentration} + \text{Background 1-hour Concentration}^2$$

$$\text{8-Hour Emissions} = ((\text{Highest Peak Hour Concentration} - \text{Background 1-hour Concentration}) \times \text{Persistence Factor}) + \text{Background 8-hour Concentration}$$

	A.M. Peak Hour	P.M. Peak Hour	8-Hour
25 Feet from Roadway Edge	3.3	3.4	1.8
50 Feet from Roadway Edge	3.2	3.3	1.7
100 Feet from Roadway Edge	3.2	3.2	1.7

<sup>2</sup> Methodology from Bay Area Air Quality Management District *BAAQMD CEQA Guidelines* (1996).

# SIMPLIFIED CALINE4 CARBON MONOXIDE ANALYSIS

Project Number: 10953-00  
 Project Title: City of Lake Forest Opportunities Study Program EIR

## Background Information

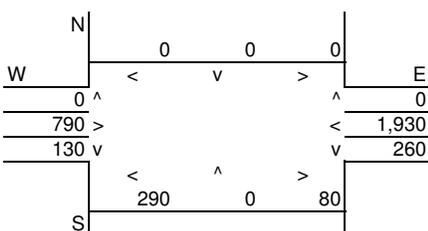
Nearest Air Monitoring Station measuring CO: Mission Viejo - 26081 Via Pera  
 Background 1-hour CO Concentration (ppm): 3.0  
 Background 8-hour CO Concentration (ppm): 1.5  
 Persistence Factor: 0.8  
 Analysis Year: 2030

## Roadway Data

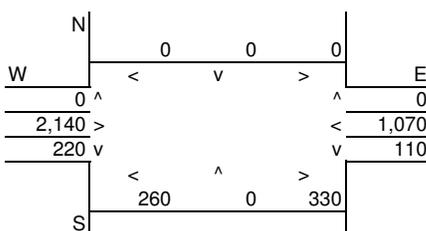
Intersection: Ridge Route & Trabuco  
 Analysis Condition: Year 2030 Traffic Volumes - Existing General Plan

	Roadway Type	No. of Lanes	Average Speed	
			A.M.	P.M.
North-South Roadway:	Lake Forest	At Grade	20	20
East-West Roadway:	Trabuco	At Grade	20	20

### A.M. Peak Hour Traffic Volumes



### P.M. Peak Hour Traffic Volumes



### Highest Traffic Volumes (Vehicles per Hour)

N-S Road:	760	N-S Road:	920
E-W Road:	3,140	E-W Road:	3,690

## Roadway CO Contributions and Concentrations

$$\text{Emissions} = (A \times B \times C) / 100,000^1$$

Roadway	A <sub>1</sub>	A <sub>2</sub>	A <sub>3</sub>	B	C	Estimated CO Concentrations		
	Reference CO Concentrations 25 Feet	50 Feet	100 Feet	Traffic Volume	Emission Factors <sup>2</sup>	25 Feet	50 Feet	100 Feet
<b>A.M. Peak Traffic Hour</b>								
North-South Road	2.7	2.2	1.7	760	1.09	0.02	0.02	0.01
East-West Road	5.7	4.6	3.4	3,140	1.09	0.20	0.16	0.12
<b>P.M. Peak Traffic Hour</b>								
North-South Road	2.7	2.2	1.7	920	1.09	0.03	0.02	0.02
East-West Road	5.7	4.6	3.4	3,690	1.09	0.23	0.19	0.14

<sup>1</sup> Methodology from Bay Area Air Quality Management District *BAAQMD CEQA Guidelines* (1996).

<sup>2</sup> Emission factors from EMFAC2002 (2003).

## Total Roadway CO Concentrations

$$\text{Peak Hour Emissions} = \text{North-South Concentration} + \text{East-West Concentration} + \text{Background 1-hour Concentration}^2$$

$$\text{8-Hour Emissions} = ((\text{Highest Peak Hour Concentration} - \text{Background 1-hour Concentration}) \times \text{Persistence Factor}) + \text{Background 8-hour Concentration}$$

	A.M. Peak Hour	P.M. Peak Hour	8-Hour
25 Feet from Roadway Edge	3.2	3.3	1.7
50 Feet from Roadway Edge	3.2	3.2	1.7
100 Feet from Roadway Edge	3.1	3.2	1.6

<sup>2</sup> Methodology from Bay Area Air Quality Management District *BAAQMD CEQA Guidelines* (1996).



# SIMPLIFIED CALINE4 CARBON MONOXIDE ANALYSIS

Project Number: 10953-00  
 Project Title: City of Lake Forest Opportunities Study Program EIR

## Background Information

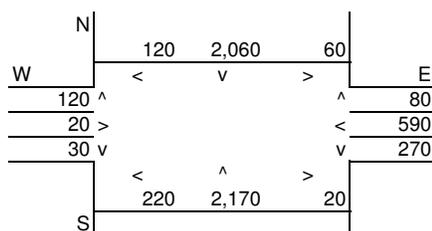
Nearest Air Monitoring Station measuring CO: Mission Viejo - 26081 Via Pera  
 Background 1-hour CO Concentration (ppm): 3.0  
 Background 8-hour CO Concentration (ppm): 1.5  
 Persistence Factor: 0.8  
 Analysis Year: 2030

## Roadway Data

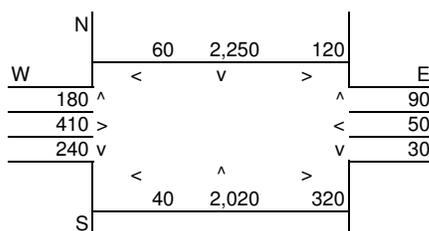
Intersection: Bake & Toledo  
 Analysis Condition: Year 2030 Traffic Volumes - Existing General Plan

	Roadway Type	No. of Lanes	Average Speed		
			A.M.	P.M.	
North-South Roadway:	Bake	At Grade	8	15	20
East-West Roadway:	Toledo	At Grade	8	15	20

### A.M. Peak Hour Traffic Volumes



### P.M. Peak Hour Traffic Volumes



### Highest Traffic Volumes (Vehicles per Hour)

N-S Road: 4,770                      N-S Road: 4,900  
 E-W Road: 1,100                    E-W Road: 1,020

## Roadway CO Contributions and Concentrations

$$\text{Emissions} = (A \times B \times C) / 100,000^1$$

Roadway	A <sub>1</sub>	A <sub>2</sub>	A <sub>3</sub>	B	C	Estimated CO Concentrations		
	Reference CO Concentrations 25 Feet	50 Feet	100 Feet	Traffic Volume	Emission Factors <sup>2</sup>	25 Feet	50 Feet	100 Feet
A.M. Peak Traffic Hour								
North-South Road	5.7	4.6	3.4	4,770	1.23	0.33	0.27	0.20
East-West Road	2.2	1.9	1.6	1,100	1.23	0.03	0.03	0.02
P.M. Peak Traffic Hour								
North-South Road	5.7	4.6	3.4	4,900	1.09	0.30	0.25	0.18
East-West Road	2.2	1.9	1.6	1,020	1.09	0.02	0.02	0.02

<sup>1</sup> Methodology from Bay Area Air Quality Management District *BAAQMD CEQA Guidelines* (1996).

<sup>2</sup> Emission factors from EMFAC2002 (2003).

## Total Roadway CO Concentrations

$$\text{Peak Hour Emissions} = \text{North-South Concentration} + \text{East-West Concentration} + \text{Background 1-hour Concentration}^2$$

$$\text{8-Hour Emissions} = ((\text{Highest Peak Hour Concentration} - \text{Background 1-hour Concentration}) \times \text{Persistence Factor}) + \text{Background 8-hour Concentration}$$

	A.M. Peak Hour	P.M. Peak Hour	8-Hour
25 Feet from Roadway Edge	3.4	3.3	1.8
50 Feet from Roadway Edge	3.3	3.3	1.7
100 Feet from Roadway Edge	3.2	3.2	1.7

<sup>2</sup> Methodology from Bay Area Air Quality Management District *BAAQMD CEQA Guidelines* (1996).

# SIMPLIFIED CALINE4 CARBON MONOXIDE ANALYSIS

**Project Number:** 10953-00  
**Project Title:** City of Lake Forest Opportunities Study Program EIR

## Background Information

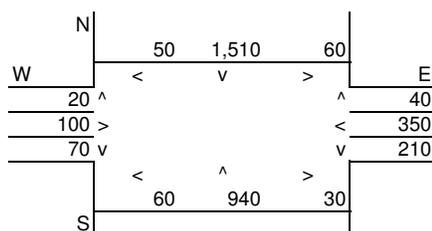
Nearest Air Monitoring Station measuring CO: Mission Viejo - 26081 Via Pera  
 Background 1-hour CO Concentration (ppm): 3.0  
 Background 8-hour CO Concentration (ppm): 1.5  
 Persistence Factor: 0.8  
 Analysis Year: 2030

## Roadway Data

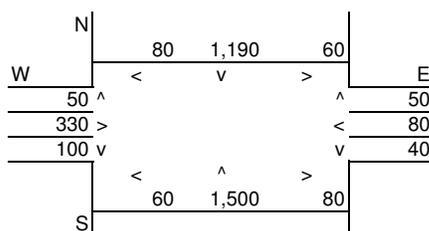
Intersection: Lake Forest & Toledo  
 Analysis Condition: Year 2030 Traffic Volumes - Existing General Plan

	Roadway Type	No. of Lanes	Average Speed		
			A.M.	P.M.	
North-South Roadway:	Lake Forest	At Grade	8	20	20
East-West Roadway:	Toledo	At Grade	6	20	20

### A.M. Peak Hour Traffic Volumes



### P.M. Peak Hour Traffic Volumes



### Highest Traffic Volumes (Vehicles per Hour)

N-S Road:	2,820	N-S Road:	2,970
E-W Road:	790	E-W Road:	700

## Roadway CO Contributions and Concentrations

Emissions = (A x B x C) / 100,000<sup>1</sup>

Roadway	A <sub>1</sub>	A <sub>2</sub>	A <sub>3</sub>	B	C	Estimated CO Concentrations		
	Reference CO Concentrations 25 Feet	50 Feet	100 Feet	Traffic Volume	Emission Factors <sup>2</sup>	25 Feet	50 Feet	100 Feet
<b>A.M. Peak Traffic Hour</b>								
North-South Road	5.7	4.6	3.4	2,820	1.09	0.18	0.14	0.10
East-West Road	2.3	2.0	1.7	790	1.09	0.02	0.02	0.01
<b>P.M. Peak Traffic Hour</b>								
North-South Road	5.7	4.6	3.4	2,970	1.09	0.18	0.15	0.11
East-West Road	2.3	2.0	1.7	700	1.09	0.02	0.02	0.01

<sup>1</sup> Methodology from Bay Area Air Quality Management District *BAAQMD CEQA Guidelines* (1996).

<sup>2</sup> Emission factors from EMFAC2002 (2003).

## Total Roadway CO Concentrations

Peak Hour Emissions = North-South Concentration + East-West Concentration + Background 1-hour Concentration<sup>2</sup>

8-Hour Emissions = ((Highest Peak Hour Concentration - Background 1-hour Concentration) x Persistence Factor) + Background 8-hour Concentration

	A.M. Peak Hour	P.M. Peak Hour	8-Hour
25 Feet from Roadway Edge	3.2	3.2	1.7
50 Feet from Roadway Edge	3.2	3.2	1.6
100 Feet from Roadway Edge	3.1	3.1	1.6

<sup>2</sup> Methodology from Bay Area Air Quality Management District *BAAQMD CEQA Guidelines* (1996).

# SIMPLIFIED CALINE4 CARBON MONOXIDE ANALYSIS

Project Number: 10953-00  
 Project Title: City of Lake Forest Opportunities Study Program EIR

## Background Information

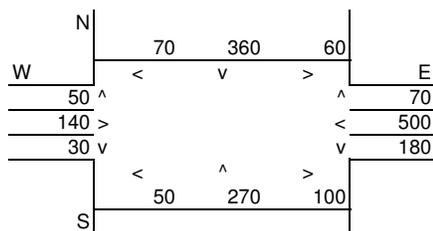
Nearest Air Monitoring Station measuring CO: Mission Viejo - 26081 Via Pera  
 Background 1-hour CO Concentration (ppm): 3.0  
 Background 8-hour CO Concentration (ppm): 1.5  
 Persistence Factor: 0.8  
 Analysis Year: 2030

## Roadway Data

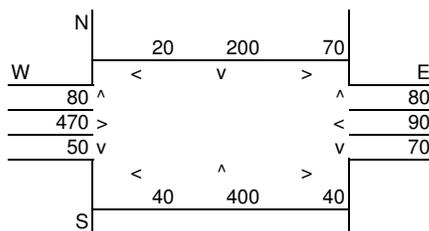
Intersection: Ridge Route & Toledo  
 Analysis Condition: Year 2030 Traffic Volumes - Existing General Plan

	Roadway Type	No. of Lanes	Average Speed		
			A.M.	P.M.	
North-South Roadway:	Ridge Route	At Grade	6	20	20
East-West Roadway:	Toledo	At Grade	6	20	20

### A.M. Peak Hour Traffic Volumes



### P.M. Peak Hour Traffic Volumes



### Highest Traffic Volumes (Vehicles per Hour)

N-S Road:	990	N-S Road:	850
E-W Road:	1,050	E-W Road:	820

## Roadway CO Contributions and Concentrations

$$\text{Emissions} = (A \times B \times C) / 100,000^1$$

Roadway	A <sub>1</sub>	A <sub>2</sub>	A <sub>3</sub>	B	C	Estimated CO Concentrations		
	Reference CO Concentrations 25 Feet	50 Feet	100 Feet	Traffic Volume	Emission Factors <sup>2</sup>	25 Feet	50 Feet	100 Feet
A.M. Peak Traffic Hour								
North-South Road	2.3	2.0	1.7	990	1.09	0.02	0.02	0.02
East-West Road	6.1	4.9	3.5	1,050	1.09	0.07	0.06	0.04
P.M. Peak Traffic Hour								
North-South Road	6.1	4.9	3.5	850	1.09	0.06	0.05	0.03
East-West Road	2.3	2.0	1.7	820	1.09	0.02	0.02	0.02

<sup>1</sup> Methodology from Bay Area Air Quality Management District *BAAQMD CEQA Guidelines* (1996).

<sup>2</sup> Emission factors from EMFAC2002 (2003).

## Total Roadway CO Concentrations

$$\text{Peak Hour Emissions} = \text{North-South Concentration} + \text{East-West Concentration} + \text{Background 1-hour Concentration}^2$$

$$\text{8-Hour Emissions} = ((\text{Highest Peak Hour Concentration} - \text{Background 1-hour Concentration}) \times \text{Persistence Factor}) + \text{Background 8-hour Concentration}$$

	A.M. Peak Hour	P.M. Peak Hour	8-Hour
25 Feet from Roadway Edge	3.1	3.1	1.6
50 Feet from Roadway Edge	3.1	3.1	1.6
100 Feet from Roadway Edge	3.1	3.0	1.5

<sup>2</sup> Methodology from Bay Area Air Quality Management District *BAAQMD CEQA Guidelines* (1996).

# SIMPLIFIED CALINE4 CARBON MONOXIDE ANALYSIS

**Project Number:** 10953-00  
**Project Title:** City of Lake Forest Opportunities Study Program EIR

## Background Information

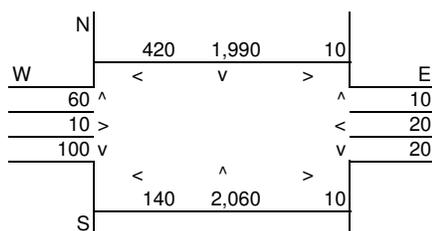
Nearest Air Monitoring Station measuring CO: Mission Viejo - 26081 Via Pera  
 Background 1-hour CO Concentration (ppm): 3.0  
 Background 8-hour CO Concentration (ppm): 1.5  
 Persistence Factor: 0.8  
 Analysis Year: 2030

## Roadway Data

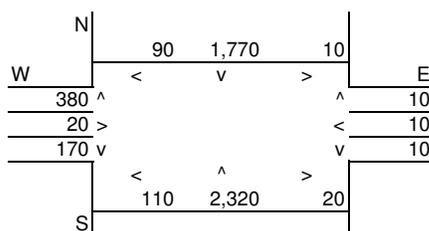
Intersection: El Toro & Toledo  
 Analysis Condition: Year 2030 Traffic Volumes - Existing General Plan

	Roadway Type	No. of Lanes	Average Speed		
			A.M.	P.M.	
North-South Roadway:	El Toro	At Grade	8	20	20
East-West Roadway:	Toledo	At Grade	4	20	20

### A.M. Peak Hour Traffic Volumes



### P.M. Peak Hour Traffic Volumes



### Highest Traffic Volumes (Vehicles per Hour)

N-S Road:	4,550	N-S Road:	4,580
E-W Road:	750	E-W Road:	780

## Roadway CO Contributions and Concentrations

$$\text{Emissions} = (A \times B \times C) / 100,000^1$$

Roadway	A <sub>1</sub>	A <sub>2</sub>	A <sub>3</sub>	B	C	Estimated CO Concentrations		
	Reference CO Concentrations 25 Feet	50 Feet	100 Feet	Traffic Volume	Emission Factors <sup>2</sup>	25 Feet	50 Feet	100 Feet
<b>A.M. Peak Traffic Hour</b>								
North-South Road	5.7	4.6	3.4	4,550	1.09	0.28	0.23	0.17
East-West Road	2.6	2.2	1.7	750	1.09	0.02	0.02	0.01
<b>P.M. Peak Traffic Hour</b>								
North-South Road	5.7	4.6	3.4	4,580	1.09	0.28	0.23	0.17
East-West Road	2.6	2.2	1.7	780	1.09	0.02	0.02	0.01

<sup>1</sup> Methodology from Bay Area Air Quality Management District *BAAQMD CEQA Guidelines* (1996).

<sup>2</sup> Emission factors from EMFAC2002 (2003).

## Total Roadway CO Concentrations

$$\text{Peak Hour Emissions} = \text{North-South Concentration} + \text{East-West Concentration} + \text{Background 1-hour Concentration}^2$$

$$\text{8-Hour Emissions} = ((\text{Highest Peak Hour Concentration} - \text{Background 1-hour Concentration}) \times \text{Persistence Factor}) + \text{Background 8-hour Concentration}$$

	A.M. Peak Hour	P.M. Peak Hour	8-Hour
25 Feet from Roadway Edge	3.3	3.3	1.7
50 Feet from Roadway Edge	3.2	3.2	1.7
100 Feet from Roadway Edge	3.2	3.2	1.6

<sup>2</sup> Methodology from Bay Area Air Quality Management District *BAAQMD CEQA Guidelines* (1996).

# SIMPLIFIED CALINE4 CARBON MONOXIDE ANALYSIS

Project Number: 10953-00  
 Project Title: City of Lake Forest Opportunities Study Program EIR

## Background Information

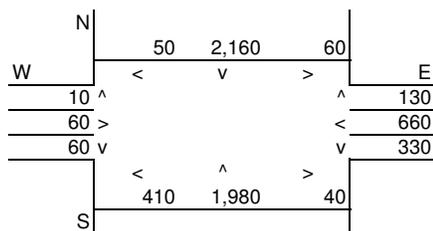
Nearest Air Monitoring Station measuring CO: Mission Viejo - 26081 Via Pera  
 Background 1-hour CO Concentration (ppm): 3.0  
 Background 8-hour CO Concentration (ppm): 1.5  
 Persistence Factor: 0.8  
 Analysis Year: 2030

## Roadway Data

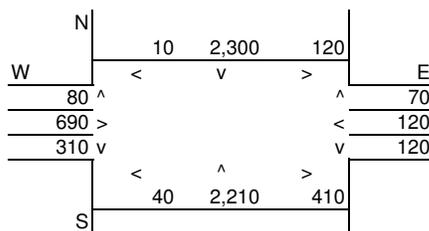
Intersection: Bake & Jeronimo  
 Analysis Condition: Year 2030 Traffic Volumes - Existing General Plan

	Roadway Type	No. of Lanes	Average Speed		
			A.M.	P.M.	
North-South Roadway:	Bake	At Grade	8	10	15
East-West Roadway:	Jeronimo	At Grade	8	10	15

### A.M. Peak Hour Traffic Volumes



### P.M. Peak Hour Traffic Volumes



### Highest Traffic Volumes (Vehicles per Hour)

N-S Road: 4,980                      N-S Road: 5,390  
 E-W Road: 1,280                      E-W Road: 1,530

## Roadway CO Contributions and Concentrations

Emissions = (A x B x C) / 100,000<sup>1</sup>

Roadway	A <sub>1</sub>	A <sub>2</sub>	A <sub>3</sub>	B	C	Estimated CO Concentrations		
	Reference CO Concentrations 25 Feet	50 Feet	100 Feet	Traffic Volume	Emission Factors <sup>2</sup>	25 Feet	50 Feet	100 Feet
<b>A.M. Peak Traffic Hour</b>								
North-South Road	5.7	4.6	3.4	4,980	1.41	0.40	0.32	0.24
East-West Road	2.2	1.9	1.6	1,280	1.41	0.04	0.03	0.03
<b>P.M. Peak Traffic Hour</b>								
North-South Road	5.7	4.6	3.4	5,390	1.23	0.38	0.30	0.23
East-West Road	2.2	1.9	1.6	1,530	1.23	0.04	0.04	0.03

<sup>1</sup> Methodology from Bay Area Air Quality Management District *BAAQMD CEQA Guidelines* (1996).

<sup>2</sup> Emission factors from EMFAC2002 (2003).

## Total Roadway CO Concentrations

Peak Hour Emissions = North-South Concentration + East-West Concentration + Background 1-hour Concentration<sup>2</sup>

8-Hour Emissions = ((Highest Peak Hour Concentration - Background 1-hour Concentration) x Persistence Factor) + Background 8-hour Concentration

	A.M. Peak Hour	P.M. Peak Hour	8-Hour
25 Feet from Roadway Edge	3.4	3.4	1.9
50 Feet from Roadway Edge	3.4	3.3	1.8
100 Feet from Roadway Edge	3.3	3.3	1.7

<sup>2</sup> Methodology from Bay Area Air Quality Management District *BAAQMD CEQA Guidelines* (1996).

# SIMPLIFIED CALINE4 CARBON MONOXIDE ANALYSIS

Project Number: 10953-00  
 Project Title: City of Lake Forest Opportunities Study Program EIR

## Background Information

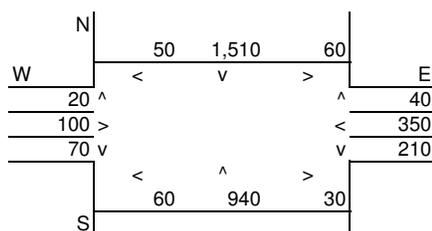
Nearest Air Monitoring Station measuring CO: Mission Viejo - 26081 Via Pera  
 Background 1-hour CO Concentration (ppm): 3.0  
 Background 8-hour CO Concentration (ppm): 1.5  
 Persistence Factor: 0.8  
 Analysis Year: 2030

## Roadway Data

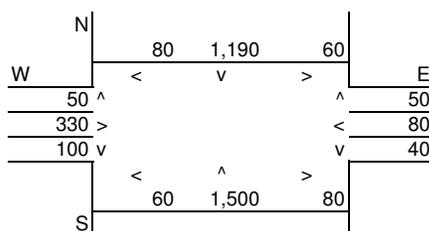
Intersection: Lake Forest & Toledo  
 Analysis Condition: Year 2030 Traffic Volumes - Existing General Plan

	Roadway Type	No. of Lanes	Average Speed		
			A.M.	P.M.	
North-South Roadway:	Lake Forest	At Grade	8	20	20
East-West Roadway:	Toledo	At Grade	6	20	20

### A.M. Peak Hour Traffic Volumes



### P.M. Peak Hour Traffic Volumes



### Highest Traffic Volumes (Vehicles per Hour)

N-S Road:	2,820	N-S Road:	2,970
E-W Road:	790	E-W Road:	700

## Roadway CO Contributions and Concentrations

$$\text{Emissions} = (A \times B \times C) / 100,000^1$$

Roadway	A <sub>1</sub>	A <sub>2</sub>	A <sub>3</sub>	B	C	Estimated CO Concentrations		
	Reference CO Concentrations 25 Feet	50 Feet	100 Feet	Traffic Volume	Emission Factors <sup>2</sup>	25 Feet	50 Feet	100 Feet
<b>A.M. Peak Traffic Hour</b>								
North-South Road	5.7	4.6	3.4	2,820	1.09	0.18	0.14	0.10
East-West Road	2.3	2.0	1.7	790	1.09	0.02	0.02	0.01
<b>P.M. Peak Traffic Hour</b>								
North-South Road	5.7	4.6	3.4	2,970	1.09	0.18	0.15	0.11
East-West Road	2.3	2.0	1.7	700	1.09	0.02	0.02	0.01

<sup>1</sup> Methodology from Bay Area Air Quality Management District *BAAQMD CEQA Guidelines* (1996).

<sup>2</sup> Emission factors from EMFAC2002 (2003).

## Total Roadway CO Concentrations

$$\text{Peak Hour Emissions} = \text{North-South Concentration} + \text{East-West Concentration} + \text{Background 1-hour Concentration}^2$$

$$\text{8-Hour Emissions} = ((\text{Highest Peak Hour Concentration} - \text{Background 1-hour Concentration}) \times \text{Persistence Factor}) + \text{Background 8-hour Concentration}$$

	A.M. Peak Hour	P.M. Peak Hour	8-Hour
25 Feet from Roadway Edge	3.2	3.2	1.7
50 Feet from Roadway Edge	3.2	3.2	1.6
100 Feet from Roadway Edge	3.1	3.1	1.6

<sup>2</sup> Methodology from Bay Area Air Quality Management District *BAAQMD CEQA Guidelines* (1996).

# SIMPLIFIED CALINE4 CARBON MONOXIDE ANALYSIS

**Project Number:** 10953-00  
**Project Title:** City of Lake Forest Opportunities Study Program EIR

## Background Information

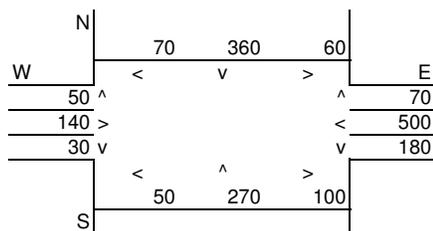
Nearest Air Monitoring Station measuring CO: Mission Viejo - 26081 Via Pera  
 Background 1-hour CO Concentration (ppm): 3.0  
 Background 8-hour CO Concentration (ppm): 1.5  
 Persistence Factor: 0.8  
 Analysis Year: 2030

## Roadway Data

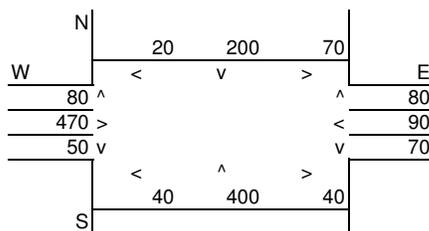
Intersection: Ridge Route & Toledo  
 Analysis Condition: Year 2030 Traffic Volumes - Existing General Plan

	Roadway Type	No. of Lanes	Average Speed		
			A.M.	P.M.	
North-South Roadway:	Ridge Route	At Grade	6	20	20
East-West Roadway:	Toledo	At Grade	6	20	20

### A.M. Peak Hour Traffic Volumes



### P.M. Peak Hour Traffic Volumes



### Highest Traffic Volumes (Vehicles per Hour)

N-S Road:	990	N-S Road:	850
E-W Road:	1,050	E-W Road:	820

## Roadway CO Contributions and Concentrations

$$\text{Emissions} = (A \times B \times C) / 100,000^1$$

Roadway	A <sub>1</sub>	A <sub>2</sub>	A <sub>3</sub>	B	C	Estimated CO Concentrations		
	Reference CO Concentrations 25 Feet	50 Feet	100 Feet	Traffic Volume	Emission Factors <sup>2</sup>	25 Feet	50 Feet	100 Feet
<b>A.M. Peak Traffic Hour</b>								
North-South Road	2.3	2.0	1.7	990	1.09	0.02	0.02	0.02
East-West Road	6.1	4.9	3.5	1,050	1.09	0.07	0.06	0.04
<b>P.M. Peak Traffic Hour</b>								
North-South Road	6.1	4.9	3.5	850	1.09	0.06	0.05	0.03
East-West Road	2.3	2.0	1.7	820	1.09	0.02	0.02	0.02

<sup>1</sup> Methodology from Bay Area Air Quality Management District *BAAQMD CEQA Guidelines* (1996).

<sup>2</sup> Emission factors from EMFAC2002 (2003).

## Total Roadway CO Concentrations

$$\text{Peak Hour Emissions} = \text{North-South Concentration} + \text{East-West Concentration} + \text{Background 1-hour Concentration}^2$$

$$\text{8-Hour Emissions} = ((\text{Highest Peak Hour Concentration} - \text{Background 1-hour Concentration}) \times \text{Persistence Factor}) + \text{Background 8-hour Concentration}$$

	A.M. Peak Hour	P.M. Peak Hour	8-Hour
25 Feet from Roadway Edge	3.1	3.1	1.6
50 Feet from Roadway Edge	3.1	3.1	1.6
100 Feet from Roadway Edge	3.1	3.0	1.5

<sup>2</sup> Methodology from Bay Area Air Quality Management District *BAAQMD CEQA Guidelines* (1996).

# SIMPLIFIED CALINE4 CARBON MONOXIDE ANALYSIS

Project Number: 10953-00  
 Project Title: City of Lake Forest Opportunities Study Program EIR

## Background Information

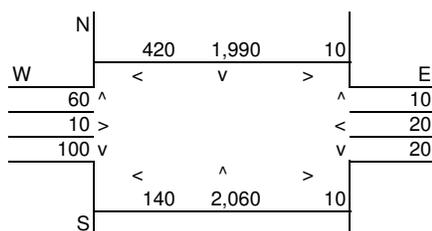
Nearest Air Monitoring Station measuring CO: Mission Viejo - 26081 Via Pera  
 Background 1-hour CO Concentration (ppm): 3.0  
 Background 8-hour CO Concentration (ppm): 1.5  
 Persistence Factor: 0.8  
 Analysis Year: 2030

## Roadway Data

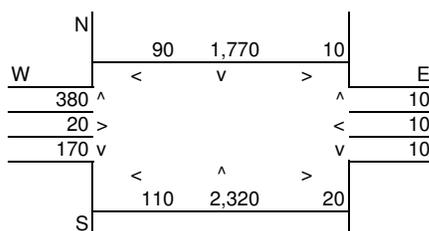
Intersection: El Toro & Toledo  
 Analysis Condition: Year 2030 Traffic Volumes - Existing General Plan

	Roadway Type	No. of Lanes	Average Speed		
			A.M.	P.M.	
North-South Roadway:	El Toro	At Grade	8	20	20
East-West Roadway:	Toledo	At Grade	4	20	20

### A.M. Peak Hour Traffic Volumes



### P.M. Peak Hour Traffic Volumes



### Highest Traffic Volumes (Vehicles per Hour)

N-S Road:	4,550	N-S Road:	4,580
E-W Road:	750	E-W Road:	780

## Roadway CO Contributions and Concentrations

$$\text{Emissions} = (A \times B \times C) / 100,000^1$$

Roadway	A <sub>1</sub>	A <sub>2</sub>	A <sub>3</sub>	B	C	Estimated CO Concentrations		
	Reference CO Concentrations 25 Feet	50 Feet	100 Feet	Traffic Volume	Emission Factors <sup>2</sup>	25 Feet	50 Feet	100 Feet
<b>A.M. Peak Traffic Hour</b>								
North-South Road	5.7	4.6	3.4	4,550	1.09	0.28	0.23	0.17
East-West Road	2.6	2.2	1.7	750	1.09	0.02	0.02	0.01
<b>P.M. Peak Traffic Hour</b>								
North-South Road	5.7	4.6	3.4	4,580	1.09	0.28	0.23	0.17
East-West Road	2.6	2.2	1.7	780	1.09	0.02	0.02	0.01

<sup>1</sup> Methodology from Bay Area Air Quality Management District *BAAQMD CEQA Guidelines* (1996).

<sup>2</sup> Emission factors from EMFAC2002 (2003).

## Total Roadway CO Concentrations

$$\text{Peak Hour Emissions} = \text{North-South Concentration} + \text{East-West Concentration} + \text{Background 1-hour Concentration}^2$$

$$\text{8-Hour Emissions} = ((\text{Highest Peak Hour Concentration} - \text{Background 1-hour Concentration}) \times \text{Persistence Factor}) + \text{Background 8-hour Concentration}$$

	A.M. Peak Hour	P.M. Peak Hour	8-Hour
25 Feet from Roadway Edge	3.3	3.3	1.7
50 Feet from Roadway Edge	3.2	3.2	1.7
100 Feet from Roadway Edge	3.2	3.2	1.6

<sup>2</sup> Methodology from Bay Area Air Quality Management District *BAAQMD CEQA Guidelines* (1996).

# SIMPLIFIED CALINE4 CARBON MONOXIDE ANALYSIS

Project Number: 10953-00  
 Project Title: City of Lake Forest Opportunities Study Program EIR

## Background Information

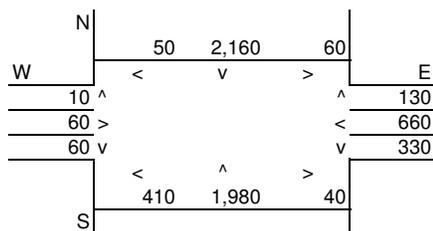
Nearest Air Monitoring Station measuring CO: Mission Viejo - 26081 Via Pera  
 Background 1-hour CO Concentration (ppm): 3.0  
 Background 8-hour CO Concentration (ppm): 1.5  
 Persistence Factor: 0.8  
 Analysis Year: 2030

## Roadway Data

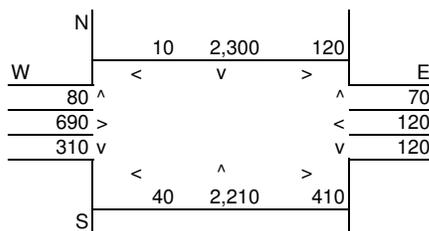
Intersection: Bake & Jeronimo  
 Analysis Condition: Year 2030 Traffic Volumes - Existing General Plan

	Roadway Type	No. of Lanes	Average Speed		
			A.M.	P.M.	
North-South Roadway:	Bake	At Grade	8	10	15
East-West Roadway:	Jeronimo	At Grade	8	10	15

### A.M. Peak Hour Traffic Volumes



### P.M. Peak Hour Traffic Volumes



### Highest Traffic Volumes (Vehicles per Hour)

N-S Road: 4,980	N-S Road: 5,390
E-W Road: 1,280	E-W Road: 1,530

## Roadway CO Contributions and Concentrations

$$\text{Emissions} = (A \times B \times C) / 100,000^1$$

Roadway	A <sub>1</sub>	A <sub>2</sub>	A <sub>3</sub>	B	C	Estimated CO Concentrations		
	Reference CO Concentrations 25 Feet	50 Feet	100 Feet	Traffic Volume	Emission Factors <sup>2</sup>	25 Feet	50 Feet	100 Feet
<b>A.M. Peak Traffic Hour</b>								
North-South Road	5.7	4.6	3.4	4,980	1.41	0.40	0.32	0.24
East-West Road	2.2	1.9	1.6	1,280	1.41	0.04	0.03	0.03
<b>P.M. Peak Traffic Hour</b>								
North-South Road	5.7	4.6	3.4	5,390	1.23	0.38	0.30	0.23
East-West Road	2.2	1.9	1.6	1,530	1.23	0.04	0.04	0.03

<sup>1</sup> Methodology from Bay Area Air Quality Management District *BAAQMD CEQA Guidelines* (1996).

<sup>2</sup> Emission factors from EMFAC2002 (2003).

## Total Roadway CO Concentrations

$$\text{Peak Hour Emissions} = \text{North-South Concentration} + \text{East-West Concentration} + \text{Background 1-hour Concentration}^2$$

$$\text{8-Hour Emissions} = ((\text{Highest Peak Hour Concentration} - \text{Background 1-hour Concentration}) \times \text{Persistence Factor}) + \text{Background 8-hour Concentration}$$

	A.M. Peak Hour	P.M. Peak Hour	8-Hour
25 Feet from Roadway Edge	3.4	3.4	1.9
50 Feet from Roadway Edge	3.4	3.3	1.8
100 Feet from Roadway Edge	3.3	3.3	1.7

<sup>2</sup> Methodology from Bay Area Air Quality Management District *BAAQMD CEQA Guidelines* (1996).

# SIMPLIFIED CALINE4 CARBON MONOXIDE ANALYSIS

Project Number: 10953-00  
 Project Title: City of Lake Forest Opportunities Study Program EIR

## Background Information

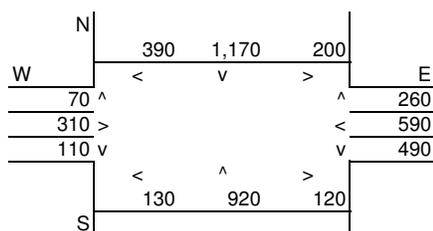
Nearest Air Monitoring Station measuring CO: Mission Viejo - 26081 Via Pera  
 Background 1-hour CO Concentration (ppm): 3.0  
 Background 8-hour CO Concentration (ppm): 1.5  
 Persistence Factor: 0.8  
 Analysis Year: 2030

## Roadway Data

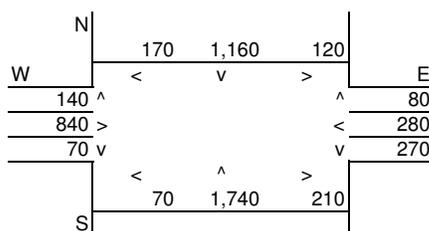
Intersection: Lake Forest & Jeronimo  
 Analysis Condition: Year 2030 Traffic Volumes - Existing General Plan

	Roadway Type	No. of Lanes	Average Speed		
			A.M.	P.M.	
North-South Roadway:	Lake Forest	At Grade	8	20	15
East-West Roadway:	Jeronimo	At Grade	6	20	15

### A.M. Peak Hour Traffic Volumes



### P.M. Peak Hour Traffic Volumes



### Highest Traffic Volumes (Vehicles per Hour)

N-S Road: 3,010                      N-S Road: 3,520  
 E-W Road: 1,970                      E-W Road: 1,800

## Roadway CO Contributions and Concentrations

$$\text{Emissions} = (A \times B \times C) / 100,000^1$$

Roadway	A <sub>1</sub>	A <sub>2</sub>	A <sub>3</sub>	B	C	Estimated CO Concentrations		
	Reference CO Concentrations 25 Feet	50 Feet	100 Feet	Traffic Volume	Emission Factors <sup>2</sup>	25 Feet	50 Feet	100 Feet
<b>A.M. Peak Traffic Hour</b>								
North-South Road	5.7	4.6	3.4	3,010	1.09	0.19	0.15	0.11
East-West Road	2.3	2.0	1.7	1,970	1.09	0.05	0.04	0.04
<b>P.M. Peak Traffic Hour</b>								
North-South Road	5.7	4.6	3.4	3,520	1.23	0.25	0.20	0.15
East-West Road	2.3	2.0	1.7	1,800	1.23	0.05	0.04	0.04

<sup>1</sup> Methodology from Bay Area Air Quality Management District *BAAQMD CEQA Guidelines* (1996).

<sup>2</sup> Emission factors from EMFAC2002 (2003).

## Total Roadway CO Concentrations

$$\text{Peak Hour Emissions} = \text{North-South Concentration} + \text{East-West Concentration} + \text{Background 1-hour Concentration}^2$$

$$\text{8-Hour Emissions} = ((\text{Highest Peak Hour Concentration} - \text{Background 1-hour Concentration}) \times \text{Persistence Factor}) + \text{Background 8-hour Concentration}$$

	A.M. Peak Hour	P.M. Peak Hour	8-Hour
25 Feet from Roadway Edge	3.2	3.3	1.7
50 Feet from Roadway Edge	3.2	3.2	1.7
100 Feet from Roadway Edge	3.1	3.2	1.6

<sup>2</sup> Methodology from Bay Area Air Quality Management District *BAAQMD CEQA Guidelines* (1996).

# SIMPLIFIED CALINE4 CARBON MONOXIDE ANALYSIS

**Project Number:** 10953-00  
**Project Title:** City of Lake Forest Opportunities Study Program EIR

## Background Information

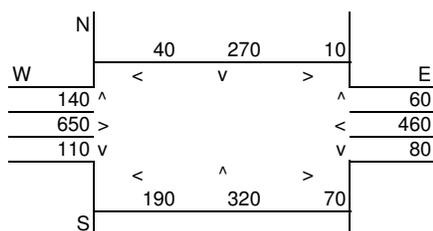
Nearest Air Monitoring Station measuring CO: Mission Viejo - 26081 Via Pera  
 Background 1-hour CO Concentration (ppm): 3.0  
 Background 8-hour CO Concentration (ppm): 1.5  
 Persistence Factor: 0.8  
 Analysis Year: 2030

## Roadway Data

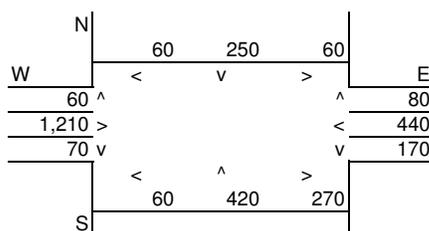
Intersection: Ridge Route & Jeronimo  
 Analysis Condition: Year 2030 Traffic Volumes - Existing General Plan

	Roadway Type	No. of Lanes	Average Speed		
			A.M.	P.M.	
North-South Roadway:	Ridge Route	At Grade	8	20	20
East-West Roadway:	Jeronimo	At Grade	6	20	20

### A.M. Peak Hour Traffic Volumes



### P.M. Peak Hour Traffic Volumes



### Highest Traffic Volumes (Vehicles per Hour)

N-S Road: 1,040                      N-S Road: 1,240  
 E-W Road: 1,590                      E-W Road: 2,230

## Roadway CO Contributions and Concentrations

Emissions = (A x B x C) / 100,000<sup>1</sup>

Roadway	A <sub>1</sub>	A <sub>2</sub>	A <sub>3</sub>	B	C	Estimated CO Concentrations		
	Reference CO Concentrations 25 Feet	50 Feet	100 Feet	Traffic Volume	Emission Factors <sup>2</sup>	25 Feet	50 Feet	100 Feet
<b>A.M. Peak Traffic Hour</b>								
North-South Road	2.2	1.9	1.6	1,040	1.09	0.02	0.02	0.02
East-West Road	6.1	4.9	3.5	1,590	1.09	0.11	0.08	0.06
<b>P.M. Peak Traffic Hour</b>								
North-South Road	2.2	1.9	1.6	1,240	1.09	0.03	0.03	0.02
East-West Road	6.1	4.9	3.5	2,230	1.09	0.15	0.12	0.09

<sup>1</sup> Methodology from Bay Area Air Quality Management District *BAAQMD CEQA Guidelines* (1996).

<sup>2</sup> Emission factors from EMFAC2002 (2003).

## Total Roadway CO Concentrations

Peak Hour Emissions = North-South Concentration + East-West Concentration + Background 1-hour Concentration<sup>2</sup>

8-Hour Emissions = ((Highest Peak Hour Concentration - Background 1-hour Concentration) x Persistence Factor) + Background 8-hour Concentration

	A.M. Peak Hour	P.M. Peak Hour	8-Hour
25 Feet from Roadway Edge	3.1	3.2	1.6
50 Feet from Roadway Edge	3.1	3.1	1.6
100 Feet from Roadway Edge	3.1	3.1	1.6

<sup>2</sup> Methodology from Bay Area Air Quality Management District *BAAQMD CEQA Guidelines* (1996).



# SIMPLIFIED CALINE4 CARBON MONOXIDE ANALYSIS

Project Number: 10953-00  
 Project Title: City of Lake Forest Opportunities Study Program EIR

## Background Information

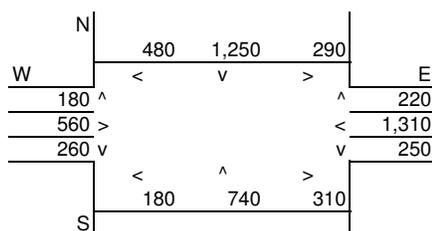
Nearest Air Monitoring Station measuring CO: Mission Viejo - 26081 Via Pera  
 Background 1-hour CO Concentration (ppm): 3.0  
 Background 8-hour CO Concentration (ppm): 1.5  
 Persistence Factor: 0.8  
 Analysis Year: 2030

## Roadway Data

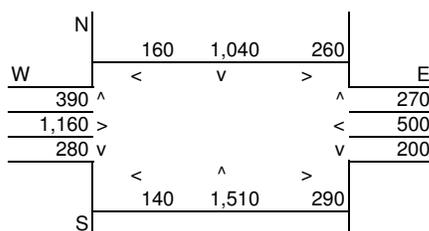
Intersection: Los Alisos & Jeronimo  
 Analysis Condition: Year 2030 Traffic Volumes - Existing General Plan

	Roadway Type	No. of Lanes	Average Speed		
			A.M.	P.M.	
North-South Roadway:	Los Alisos	At Grade	8	10	10
East-West Roadway:	Jeronimo	At Grade	8	10	10

### A.M. Peak Hour Traffic Volumes



### P.M. Peak Hour Traffic Volumes



### Highest Traffic Volumes (Vehicles per Hour)

A.M. Peak Hour:  
 N-S Road: 3,160  
 E-W Road: 2,970

P.M. Peak Hour:  
 N-S Road: 3,630  
 E-W Road: 2,680

## Roadway CO Contributions and Concentrations

$$\text{Emissions} = (A \times B \times C) / 100,000^1$$

Roadway	Reference CO Concentrations			B Traffic Volume	C Emission Factors <sup>2</sup>	Estimated CO Concentrations		
	A <sub>1</sub> 25 Feet	A <sub>2</sub> 50 Feet	A <sub>3</sub> 100 Feet			25 Feet	50 Feet	100 Feet
<b>A.M. Peak Traffic Hour</b>								
North-South Road	5.7	4.6	3.4	3,160	1.41	0.25	0.20	0.15
East-West Road	2.2	1.9	1.6	2,970	1.41	0.09	0.08	0.07
<b>P.M. Peak Traffic Hour</b>								
North-South Road	5.7	4.6	3.4	3,630	1.41	0.29	0.24	0.17
East-West Road	2.2	1.9	1.6	2,680	1.41	0.08	0.07	0.06

<sup>1</sup> Methodology from Bay Area Air Quality Management District *BAAQMD CEQA Guidelines* (1996).

<sup>2</sup> Emission factors from EMFAC2002 (2003).

## Total Roadway CO Concentrations

$$\text{Peak Hour Emissions} = \text{North-South Concentration} + \text{East-West Concentration} + \text{Background 1-hour Concentration}^2$$

$$\text{8-Hour Emissions} = ((\text{Highest Peak Hour Concentration} - \text{Background 1-hour Concentration}) \times \text{Persistence Factor}) + \text{Background 8-hour Concentration}$$

	A.M. Peak Hour	P.M. Peak Hour	8-Hour
25 Feet from Roadway Edge	3.3	3.4	1.8
50 Feet from Roadway Edge	3.3	3.3	1.7
100 Feet from Roadway Edge	3.2	3.2	1.7

<sup>2</sup> Methodology from Bay Area Air Quality Management District *BAAQMD CEQA Guidelines* (1996).

# SIMPLIFIED CALINE4 CARBON MONOXIDE ANALYSIS

**Project Number:** 10953-00  
**Project Title:** City of Lake Forest Opportunities Study Program EIR

## Background Information

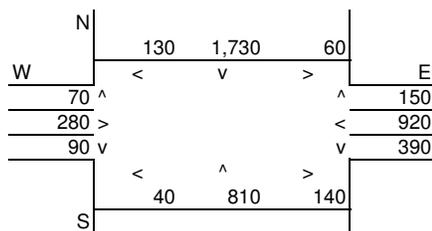
Nearest Air Monitoring Station measuring CO: Mission Viejo - 26081 Via Pera  
 Background 1-hour CO Concentration (ppm): 3.0  
 Background 8-hour CO Concentration (ppm): 1.5  
 Persistence Factor: 0.8  
 Analysis Year: 2030

## Roadway Data

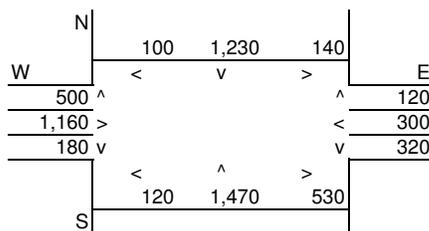
Intersection: Lake Forest & Muirlands  
 Analysis Condition: Year 2030 Traffic Volumes - Existing General Plan

	Roadway Type	No. of Lanes	Average Speed		
			A.M.	P.M.	
North-South Roadway:	Lake Forest	At Grade	8	20	15
East-West Roadway:	Muirlands	At Grade	8	20	15

### A.M. Peak Hour Traffic Volumes



### P.M. Peak Hour Traffic Volumes



### Highest Traffic Volumes (Vehicles per Hour)

N-S Road:	3,200	N-S Road:	3,850
E-W Road:	1,940	E-W Road:	2,570

## Roadway CO Contributions and Concentrations

$$\text{Emissions} = (A \times B \times C) / 100,000^1$$

Roadway	Reference CO Concentrations			B Traffic Volume	C Emission Factors <sup>2</sup>	Estimated CO Concentrations		
	A <sub>1</sub> 25 Feet	A <sub>2</sub> 50 Feet	A <sub>3</sub> 100 Feet			25 Feet	50 Feet	100 Feet
<b>A.M. Peak Traffic Hour</b>								
North-South Road	5.7	4.6	3.4	3,200	1.09	0.20	0.16	0.12
East-West Road	2.2	1.9	1.6	1,940	1.09	0.05	0.04	0.03
<b>P.M. Peak Traffic Hour</b>								
North-South Road	5.7	4.6	3.4	3,850	1.23	0.27	0.22	0.16
East-West Road	2.2	1.9	1.6	2,570	1.23	0.07	0.06	0.05

<sup>1</sup> Methodology from Bay Area Air Quality Management District *BAAQMD CEQA Guidelines* (1996).

<sup>2</sup> Emission factors from EMFAC2002 (2003).

## Total Roadway CO Concentrations

$$\text{Peak Hour Emissions} = \text{North-South Concentration} + \text{East-West Concentration} + \text{Background 1-hour Concentration}^2$$

$$\text{8-Hour Emissions} = ((\text{Highest Peak Hour Concentration} - \text{Background 1-hour Concentration}) \times \text{Persistence Factor}) + \text{Background 8-hour Concentration}$$

	A.M. Peak Hour	P.M. Peak Hour	8-Hour
25 Feet from Roadway Edge	3.2	3.3	1.8
50 Feet from Roadway Edge	3.2	3.3	1.7
100 Feet from Roadway Edge	3.2	3.2	1.7

<sup>2</sup> Methodology from Bay Area Air Quality Management District *BAAQMD CEQA Guidelines* (1996).

# SIMPLIFIED CALINE4 CARBON MONOXIDE ANALYSIS

Project Number: 10953-00  
 Project Title: City of Lake Forest Opportunities Study Program EIR

## Background Information

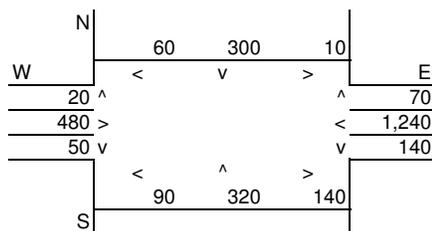
Nearest Air Monitoring Station measuring CO: Mission Viejo - 26081 Via Pera  
 Background 1-hour CO Concentration (ppm): 3.0  
 Background 8-hour CO Concentration (ppm): 1.5  
 Persistence Factor: 0.8  
 Analysis Year: 2030

## Roadway Data

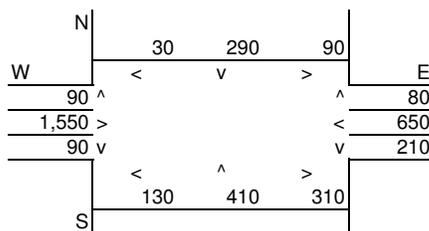
Intersection: Ridge Route & Muirlands  
 Analysis Condition: Year 2030 Traffic Volumes - Existing General Plan

	Roadway Type	No. of Lanes	Average Speed		
			A.M.	P.M.	
North-South Roadway:	Ridge Route	At Grade	8	20	20
East-West Roadway:	Muirlands	At Grade	8	20	20

### A.M. Peak Hour Traffic Volumes



### P.M. Peak Hour Traffic Volumes



### Highest Traffic Volumes (Vehicles per Hour)

N-S Road:	1,040	N-S Road:	1,440
E-W Road:	2,080	E-W Road:	2,890

## Roadway CO Contributions and Concentrations

$$\text{Emissions} = (A \times B \times C) / 100,000^1$$

Roadway	A <sub>1</sub>	A <sub>2</sub>	A <sub>3</sub>	B	C	Estimated CO Concentrations		
	Reference CO Concentrations 25 Feet	50 Feet	100 Feet	Traffic Volume	Emission Factors <sup>2</sup>	25 Feet	50 Feet	100 Feet
A.M. Peak Traffic Hour								
North-South Road	2.2	1.9	1.6	1,040	1.09	0.02	0.02	0.02
East-West Road	5.7	4.6	3.4	2,080	1.09	0.13	0.10	0.08
P.M. Peak Traffic Hour								
North-South Road	2.2	1.9	1.6	1,440	1.09	0.03	0.03	0.03
East-West Road	5.7	4.6	3.4	2,890	1.09	0.18	0.14	0.11

<sup>1</sup> Methodology from Bay Area Air Quality Management District *BAAQMD CEQA Guidelines* (1996).

<sup>2</sup> Emission factors from EMFAC2002 (2003).

## Total Roadway CO Concentrations

$$\text{Peak Hour Emissions} = \text{North-South Concentration} + \text{East-West Concentration} + \text{Background 1-hour Concentration}^2$$

$$\text{8-Hour Emissions} = ((\text{Highest Peak Hour Concentration} - \text{Background 1-hour Concentration}) \times \text{Persistence Factor}) + \text{Background 8-hour Concentration}$$

	A.M. Peak Hour	P.M. Peak Hour	8-Hour
25 Feet from Roadway Edge	3.2	3.2	1.7
50 Feet from Roadway Edge	3.1	3.2	1.6
100 Feet from Roadway Edge	3.1	3.1	1.6

<sup>2</sup> Methodology from Bay Area Air Quality Management District *BAAQMD CEQA Guidelines* (1996).



# SIMPLIFIED CALINE4 CARBON MONOXIDE ANALYSIS

**Project Number:** 10953-00  
**Project Title:** City of Lake Forest Opportunities Study Program EIR

## Background Information

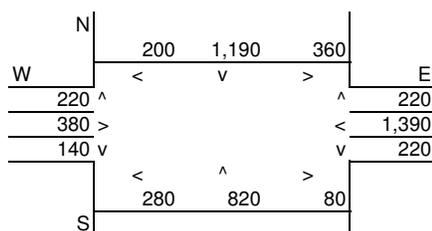
Nearest Air Monitoring Station measuring CO: Mission Viejo - 26081 Via Pera  
 Background 1-hour CO Concentration (ppm): 3.0  
 Background 8-hour CO Concentration (ppm): 1.5  
 Persistence Factor: 0.8  
 Analysis Year: 2030

## Roadway Data

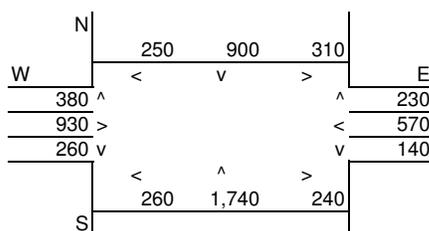
Intersection: Los Alisos & Muirlands  
 Analysis Condition: Year 2030 Traffic Volumes - Existing General Plan

	Roadway Type	No. of Lanes	Average Speed		
			A.M.	P.M.	
North-South Roadway:	Los Alisos	At Grade	8	5	5
East-West Roadway:	Muirlands	At Grade	6	5	5

### A.M. Peak Hour Traffic Volumes



### P.M. Peak Hour Traffic Volumes



### Highest Traffic Volumes (Vehicles per Hour)

N-S Road: 3,010                      N-S Road: 3,810  
 E-W Road: 2,650                      E-W Road: 2,650

## Roadway CO Contributions and Concentrations

$$\text{Emissions} = (A \times B \times C) / 100,000^1$$

Roadway	A <sub>1</sub>	A <sub>2</sub>	A <sub>3</sub>	B	C	Estimated CO Concentrations		
	Reference CO Concentrations 25 Feet	50 Feet	100 Feet	Traffic Volume	Emission Factors <sup>2</sup>	25 Feet	50 Feet	100 Feet
<b>A.M. Peak Traffic Hour</b>								
North-South Road	5.7	4.6	3.4	3,010	1.65	0.28	0.23	0.17
East-West Road	2.3	2.0	1.7	2,650	1.65	0.10	0.09	0.07
<b>P.M. Peak Traffic Hour</b>								
North-South Road	5.7	4.6	3.4	3,810	1.65	0.36	0.29	0.21
East-West Road	2.3	2.0	1.7	2,650	1.65	0.10	0.09	0.07

<sup>1</sup> Methodology from Bay Area Air Quality Management District *BAAQMD CEQA Guidelines* (1996).

<sup>2</sup> Emission factors from EMFAC2002 (2003).

## Total Roadway CO Concentrations

$$\text{Peak Hour Emissions} = \text{North-South Concentration} + \text{East-West Concentration} + \text{Background 1-hour Concentration}^2$$

$$\text{8-Hour Emissions} = ((\text{Highest Peak Hour Concentration} - \text{Background 1-hour Concentration}) \times \text{Persistence Factor}) + \text{Background 8-hour Concentration}$$

	A.M. Peak Hour	P.M. Peak Hour	8-Hour
25 Feet from Roadway Edge	3.4	3.5	1.9
50 Feet from Roadway Edge	3.3	3.4	1.8
100 Feet from Roadway Edge	3.2	3.3	1.7

<sup>2</sup> Methodology from Bay Area Air Quality Management District *BAAQMD CEQA Guidelines* (1996).

# SIMPLIFIED CALINE4 CARBON MONOXIDE ANALYSIS

**Project Number:** 10953-00  
**Project Title:** City of Lake Forest Opportunities Study Program EIR

## Background Information

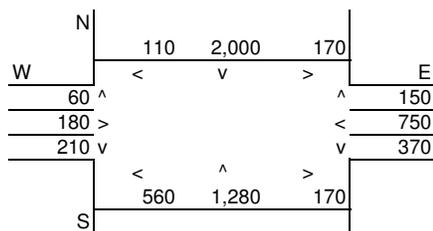
Nearest Air Monitoring Station measuring CO: Mission Viejo - 26081 Via Pera  
 Background 1-hour CO Concentration (ppm): 3.0  
 Background 8-hour CO Concentration (ppm): 1.5  
 Persistence Factor: 0.8  
 Analysis Year: 2030

## Roadway Data

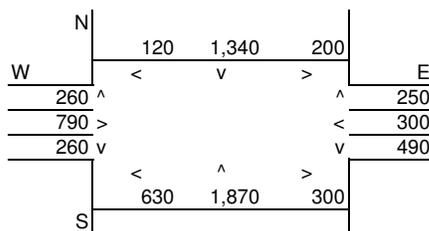
Intersection: Lake Forest & Rockfield  
 Analysis Condition: Year 2030 Traffic Volumes - Existing General Plan

	Roadway Type	No. of Lanes	Average Speed		
			A.M.	P.M.	
North-South Roadway:	Lake Forest	At Grade	8	20	15
East-West Roadway:	Rockfield	At Grade	8	20	15

### A.M. Peak Hour Traffic Volumes



### P.M. Peak Hour Traffic Volumes



### Highest Traffic Volumes (Vehicles per Hour)

N-S Road: 4,590                      N-S Road: 4,890  
 E-W Road: 1,870                    E-W Road: 2,360

## Roadway CO Contributions and Concentrations

Emissions = (A x B x C) / 100,000<sup>1</sup>

Roadway	A <sub>1</sub>	A <sub>2</sub>	A <sub>3</sub>	B	C	Estimated CO Concentrations		
	Reference CO Concentrations 25 Feet	50 Feet	100 Feet	Traffic Volume	Emission Factors <sup>2</sup>	25 Feet	50 Feet	100 Feet
<b>A.M. Peak Traffic Hour</b>								
North-South Road	5.7	4.6	3.4	4,590	1.09	0.29	0.23	0.17
East-West Road	2.2	1.9	1.6	1,870	1.09	0.04	0.04	0.03
<b>P.M. Peak Traffic Hour</b>								
North-South Road	5.7	4.6	3.4	4,890	1.23	0.34	0.28	0.20
East-West Road	2.2	1.9	1.6	2,360	1.23	0.06	0.06	0.05

<sup>1</sup> Methodology from Bay Area Air Quality Management District *BAAQMD CEQA Guidelines* (1996).

<sup>2</sup> Emission factors from EMFAC2002 (2003).

## Total Roadway CO Concentrations

Peak Hour Emissions = North-South Concentration + East-West Concentration + Background 1-hour Concentration<sup>2</sup>

8-Hour Emissions = ((Highest Peak Hour Concentration - Background 1-hour Concentration) x Persistence Factor) + Background 8-hour Concentration

	A.M. Peak Hour	P.M. Peak Hour	8-Hour
25 Feet from Roadway Edge	3.3	3.4	1.8
50 Feet from Roadway Edge	3.3	3.3	1.8
100 Feet from Roadway Edge	3.2	3.3	1.7

<sup>2</sup> Methodology from Bay Area Air Quality Management District *BAAQMD CEQA Guidelines* (1996).







# SIMPLIFIED CALINE4 CARBON MONOXIDE ANALYSIS

**Project Number:** 10953-00  
**Project Title:** City of Lake Forest Opportunities Study Program EIR

## Background Information

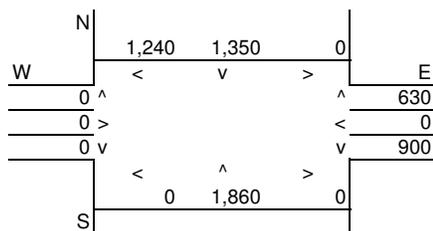
Nearest Air Monitoring Station measuring CO: Mission Viejo - 26081 Via Pera  
 Background 1-hour CO Concentration (ppm): 3.0  
 Background 8-hour CO Concentration (ppm): 1.5  
 Persistence Factor: 0.8  
 Analysis Year: 2030

## Roadway Data

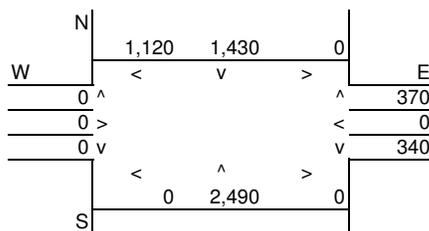
Intersection: Lake Forest & I-5 NB  
 Analysis Condition: Year 2030 Traffic Volumes - Existing General Plan

	Roadway Type	No. of Lanes	Average Speed		
			A.M.	P.M.	
North-South Roadway:	Lake Forest	At Grade	6	20	20
East-West Roadway:	I-5 NB	At Grade	4	20	20

### A.M. Peak Hour Traffic Volumes



### P.M. Peak Hour Traffic Volumes



### Highest Traffic Volumes (Vehicles per Hour)

N-S Road: 5,080                      N-S Road: 5,410  
 E-W Road: 1,530                      E-W Road: 1,120

## Roadway CO Contributions and Concentrations

Emissions = (A x B x C) / 100,000<sup>1</sup>

Roadway	A <sub>1</sub>	A <sub>2</sub>	A <sub>3</sub>	B	C	Estimated CO Concentrations		
	Reference CO Concentrations 25 Feet	50 Feet	100 Feet	Traffic Volume	Emission Factors <sup>2</sup>	25 Feet	50 Feet	100 Feet
<b>A.M. Peak Traffic Hour</b>								
North-South Road	6.1	4.9	3.5	5,080	1.09	0.34	0.27	0.19
East-West Road	2.6	2.2	1.7	1,530	1.09	0.04	0.04	0.03
<b>P.M. Peak Traffic Hour</b>								
North-South Road	6.1	4.9	3.5	5,410	1.09	0.36	0.29	0.21
East-West Road	2.6	2.2	1.7	1,120	1.09	0.03	0.03	0.02

<sup>1</sup> Methodology from Bay Area Air Quality Management District *BAAQMD CEQA Guidelines* (1996).

<sup>2</sup> Emission factors from EMFAC2002 (2003).

## Total Roadway CO Concentrations

Peak Hour Emissions = North-South Concentration + East-West Concentration + Background 1-hour Concentration<sup>2</sup>

8-Hour Emissions = ((Highest Peak Hour Concentration - Background 1-hour Concentration) x Persistence Factor) + Background 8-hour Concentration

	A.M. Peak Hour	P.M. Peak Hour	8-Hour
25 Feet from Roadway Edge	3.4	3.4	1.8
50 Feet from Roadway Edge	3.3	3.3	1.8
100 Feet from Roadway Edge	3.2	3.2	1.7

<sup>2</sup> Methodology from Bay Area Air Quality Management District *BAAQMD CEQA Guidelines* (1996).

# SIMPLIFIED CALINE4 CARBON MONOXIDE ANALYSIS

**Project Number:** 10953-00  
**Project Title:** City of Lake Forest Opportunities Study Program EIR

## Background Information

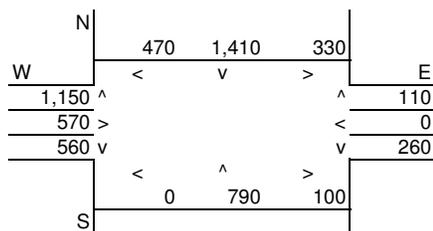
Nearest Air Monitoring Station measuring CO: Mission Viejo - 26081 Via Pera  
 Background 1-hour CO Concentration (ppm): 3.0  
 Background 8-hour CO Concentration (ppm): 1.5  
 Persistence Factor: 0.8  
 Analysis Year: 2030

## Roadway Data

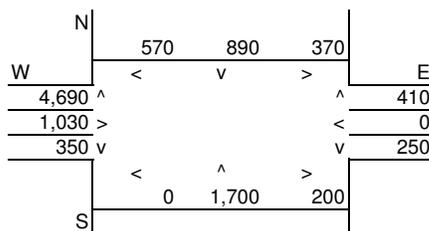
Intersection: Lake Forest & I-5 Carlota  
 Analysis Condition: Year 2030 Traffic Volumes - Existing General Plan

	Roadway Type	No. of Lanes	Average Speed		
			A.M.	P.M.	
North-South Roadway:	Lake Forest	At Grade	8	15	10
East-West Roadway:	I-5 Carlota	At Grade	8	15	10

### A.M. Peak Hour Traffic Volumes



### P.M. Peak Hour Traffic Volumes



### Highest Traffic Volumes (Vehicles per Hour)

N-S Road:	4,260	N-S Road:	8,630
E-W Road:	2,750	E-W Road:	6,640

## Roadway CO Contributions and Concentrations

Emissions = (A x B x C) / 100,000<sup>1</sup>

Roadway	A <sub>1</sub>	A <sub>2</sub>	A <sub>3</sub>	B	C	Estimated CO Concentrations		
	Reference CO Concentrations 25 Feet	50 Feet	100 Feet	Traffic Volume	Emission Factors <sup>2</sup>	25 Feet	50 Feet	100 Feet
<b>A.M. Peak Traffic Hour</b>								
North-South Road	5.7	4.6	3.4	4,260	1.23	0.30	0.24	0.18
East-West Road	2.2	1.9	1.6	2,750	1.23	0.07	0.06	0.05
<b>P.M. Peak Traffic Hour</b>								
North-South Road	5.7	4.6	3.4	8,630	1.41	0.69	0.56	0.41
East-West Road	2.2	1.9	1.6	6,640	1.41	0.21	0.18	0.15

<sup>1</sup> Methodology from Bay Area Air Quality Management District *BAAQMD CEQA Guidelines* (1996).

<sup>2</sup> Emission factors from EMFAC2002 (2003).

## Total Roadway CO Concentrations

Peak Hour Emissions = North-South Concentration + East-West Concentration + Background 1-hour Concentration<sup>2</sup>

8-Hour Emissions = ((Highest Peak Hour Concentration - Background 1-hour Concentration) x Persistence Factor) + Background 8-hour Concentration

	A.M. Peak Hour	P.M. Peak Hour	8-Hour
25 Feet from Roadway Edge	3.4	3.9	2.2
50 Feet from Roadway Edge	3.3	3.7	2.1
100 Feet from Roadway Edge	3.2	3.6	2.0

<sup>2</sup> Methodology from Bay Area Air Quality Management District *BAAQMD CEQA Guidelines* (1996).



# SIMPLIFIED CALINE4 CARBON MONOXIDE ANALYSIS

Project Number: 10953-00  
 Project Title: City of Lake Forest Opportunities Study Program EIR

## Background Information

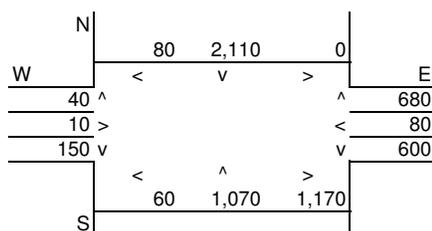
Nearest Air Monitoring Station measuring CO: Mission Viejo - 26081 Via Pera  
 Background 1-hour CO Concentration (ppm): 3.0  
 Background 8-hour CO Concentration (ppm): 1.5  
 Persistence Factor: 0.8  
 Analysis Year: 2030

## Roadway Data

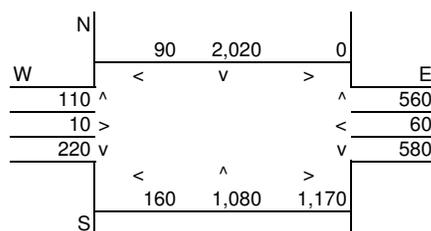
Intersection: El Toro & Bridger I-5 NB  
 Analysis Condition: Year 2030 Traffic Volumes - Existing General Plan

	Roadway Type	No. of Lanes	Average Speed		
			A.M.	P.M.	
North-South Roadway:	El Toro	At Grade	8	20	20
East-West Roadway:	Bridger I-5 NB	At Grade	6	20	20

### A.M. Peak Hour Traffic Volumes



### P.M. Peak Hour Traffic Volumes



### Highest Traffic Volumes (Vehicles per Hour)

N-S Road: 5,160	N-S Road: 5,230
E-W Road: 2,540	E-W Road: 2,380

## Roadway CO Contributions and Concentrations

$$\text{Emissions} = (A \times B \times C) / 100,000^1$$

Roadway	A <sub>1</sub>	A <sub>2</sub>	A <sub>3</sub>	B	C	Estimated CO Concentrations		
	Reference CO Concentrations 25 Feet	50 Feet	100 Feet	Traffic Volume	Emission Factors <sup>2</sup>	25 Feet	50 Feet	100 Feet
<b>A.M. Peak Traffic Hour</b>								
North-South Road	5.7	4.6	3.4	5,160	1.09	0.32	0.26	0.19
East-West Road	2.3	2.0	1.7	2,540	1.09	0.06	0.06	0.05
<b>P.M. Peak Traffic Hour</b>								
North-South Road	5.7	4.6	3.4	5,230	1.09	0.32	0.26	0.19
East-West Road	2.3	2.0	1.7	2,380	1.09	0.06	0.05	0.04

<sup>1</sup> Methodology from Bay Area Air Quality Management District *BAAQMD CEQA Guidelines* (1996).

<sup>2</sup> Emission factors from EMFAC2002 (2003).

## Total Roadway CO Concentrations

$$\text{Peak Hour Emissions} = \text{North-South Concentration} + \text{East-West Concentration} + \text{Background 1-hour Concentration}^2$$

$$\text{8-Hour Emissions} = ((\text{Highest Peak Hour Concentration} - \text{Background 1-hour Concentration}) \times \text{Persistence Factor}) + \text{Background 8-hour Concentration}$$

	A.M. Peak Hour	P.M. Peak Hour	8-Hour
25 Feet from Roadway Edge	3.4	3.4	1.8
50 Feet from Roadway Edge	3.3	3.3	1.8
100 Feet from Roadway Edge	3.2	3.2	1.7

<sup>2</sup> Methodology from Bay Area Air Quality Management District *BAAQMD CEQA Guidelines* (1996).

# SIMPLIFIED CALINE4 CARBON MONOXIDE ANALYSIS

**Project Number:** 10953-00  
**Project Title:** City of Lake Forest Opportunities Study Program EIR

## Background Information

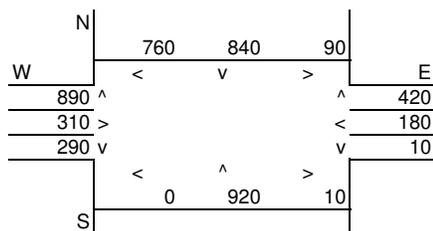
Nearest Air Monitoring Station measuring CO: Mission Viejo - 26081 Via Pera  
 Background 1-hour CO Concentration (ppm): 3.0  
 Background 8-hour CO Concentration (ppm): 1.5  
 Persistence Factor: 0.8  
 Analysis Year: 2030

## Roadway Data

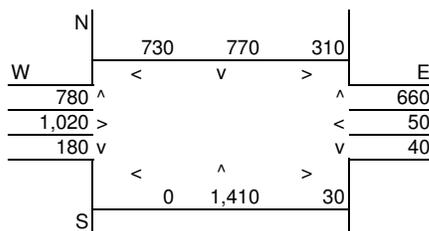
Intersection: El Toro & Avd Carlota  
 Analysis Condition: Year 2030 Traffic Volumes - Existing General Plan

	Roadway Type	No. of Lanes	Average Speed		
			A.M.	P.M.	
North-South Roadway:	El Toro	At Grade	8	20	10
East-West Roadway:	Avd Carlota	At Grade	8	20	10

### A.M. Peak Hour Traffic Volumes



### P.M. Peak Hour Traffic Volumes



### Highest Traffic Volumes (Vehicles per Hour)

N-S Road: 3,920  
 E-W Road: 2,430

N-S Road: 4,660  
 E-W Road: 2,760

## Roadway CO Contributions and Concentrations

$$\text{Emissions} = (A \times B \times C) / 100,000^1$$

Roadway	Reference CO Concentrations			B Traffic Volume	C Emission Factors <sup>2</sup>	Estimated CO Concentrations		
	A <sub>1</sub> 25 Feet	A <sub>2</sub> 50 Feet	A <sub>3</sub> 100 Feet			25 Feet	50 Feet	100 Feet
<b>A.M. Peak Traffic Hour</b>								
North-South Road	5.7	4.6	3.4	3,920	1.09	0.24	0.20	0.15
East-West Road	2.2	1.9	1.6	2,430	1.09	0.06	0.05	0.04
<b>P.M. Peak Traffic Hour</b>								
North-South Road	5.7	4.6	3.4	4,660	1.41	0.37	0.30	0.22
East-West Road	2.2	1.9	1.6	2,760	1.41	0.09	0.07	0.06

<sup>1</sup> Methodology from Bay Area Air Quality Management District *BAAQMD CEQA Guidelines* (1996).

<sup>2</sup> Emission factors from EMFAC2002 (2003).

## Total Roadway CO Concentrations

$$\text{Peak Hour Emissions} = \text{North-South Concentration} + \text{East-West Concentration} + \text{Background 1-hour Concentration}^2$$

$$\text{8-Hour Emissions} = ((\text{Highest Peak Hour Concentration} - \text{Background 1-hour Concentration}) \times \text{Persistence Factor}) + \text{Background 8-hour Concentration}$$

	A.M. Peak Hour	P.M. Peak Hour	8-Hour
25 Feet from Roadway Edge	3.3	3.5	1.9
50 Feet from Roadway Edge	3.2	3.4	1.8
100 Feet from Roadway Edge	3.2	3.3	1.7

<sup>2</sup> Methodology from Bay Area Air Quality Management District *BAAQMD CEQA Guidelines* (1996).

# SIMPLIFIED CALINE4 CARBON MONOXIDE ANALYSIS

Project Number: 10953-00  
 Project Title: City of Lake Forest Opportunities Study Program EIR

## Background Information

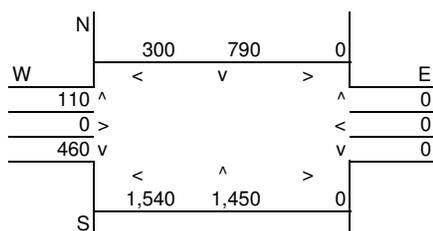
Nearest Air Monitoring Station measuring CO: Mission Viejo - 26081 Via Pera  
 Background 1-hour CO Concentration (ppm): 3.0  
 Background 8-hour CO Concentration (ppm): 1.5  
 Persistence Factor: 0.8  
 Analysis Year: 2030

## Roadway Data

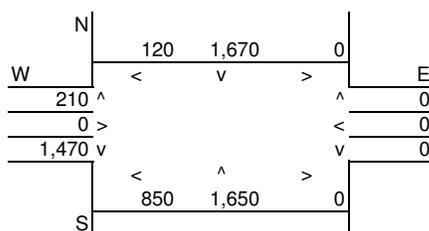
Intersection: Portola & Rancho  
 Analysis Condition: Year 2030 Traffic Volumes - Existing General Plan

	Roadway Type	No. of Lanes	Average Speed		
			A.M.	P.M.	
North-South Roadway:	Portola	At Grade	8	20	20
East-West Roadway:	Rancho	At Grade	4	20	20

### A.M. Peak Hour Traffic Volumes



### P.M. Peak Hour Traffic Volumes



### Highest Traffic Volumes (Vehicles per Hour)

N-S Road: 4,240                      N-S Road: 5,640  
 E-W Road: 2,410                      E-W Road: 2,650

## Roadway CO Contributions and Concentrations

$$\text{Emissions} = (A \times B \times C) / 100,000^1$$

Roadway	A <sub>1</sub>	A <sub>2</sub>	A <sub>3</sub>	B	C	Estimated CO Concentrations		
	Reference CO Concentrations 25 Feet	50 Feet	100 Feet	Traffic Volume	Emission Factors <sup>2</sup>	25 Feet	50 Feet	100 Feet
<b>A.M. Peak Traffic Hour</b>								
North-South Road	5.7	4.6	3.4	4,240	1.09	0.26	0.21	0.16
East-West Road	2.6	2.2	1.7	2,410	1.09	0.07	0.06	0.04
<b>P.M. Peak Traffic Hour</b>								
North-South Road	5.7	4.6	3.4	5,640	1.09	0.35	0.28	0.21
East-West Road	2.6	2.2	1.7	2,650	1.09	0.08	0.06	0.05

<sup>1</sup> Methodology from Bay Area Air Quality Management District *BAAQMD CEQA Guidelines* (1996).

<sup>2</sup> Emission factors from EMFAC2002 (2003).

## Total Roadway CO Concentrations

$$\text{Peak Hour Emissions} = \text{North-South Concentration} + \text{East-West Concentration} + \text{Background 1-hour Concentration}^2$$

$$\text{8-Hour Emissions} = ((\text{Highest Peak Hour Concentration} - \text{Background 1-hour Concentration}) \times \text{Persistence Factor}) + \text{Background 8-hour Concentration}$$

	A.M. Peak Hour	P.M. Peak Hour	8-Hour
25 Feet from Roadway Edge	3.3	3.4	1.8
50 Feet from Roadway Edge	3.3	3.3	1.8
100 Feet from Roadway Edge	3.2	3.3	1.7

<sup>2</sup> Methodology from Bay Area Air Quality Management District *BAAQMD CEQA Guidelines* (1996).

# SIMPLIFIED CALINE4 CARBON MONOXIDE ANALYSIS

**Project Number:** 10953-00  
**Project Title:** City of Lake Forest Opportunities Study Program EIR

## Background Information

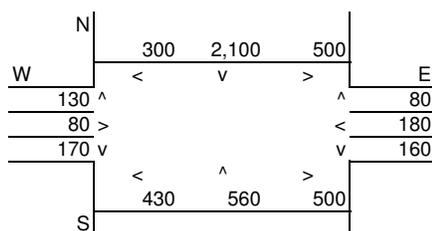
Nearest Air Monitoring Station measuring CO: Mission Viejo - 26081 Via Pera  
 Background 1-hour CO Concentration (ppm): 3.0  
 Background 8-hour CO Concentration (ppm): 1.5  
 Persistence Factor: 0.8  
 Analysis Year: 2030

## Roadway Data

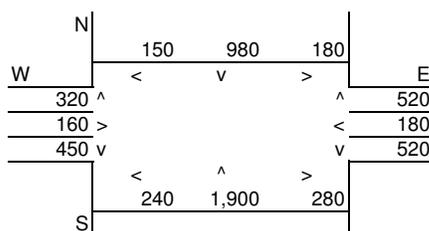
Intersection: Alton & Towne Centre Dr.  
 Analysis Condition: Year 2030 Traffic Volumes - Existing General Plan

	Roadway Type	No. of Lanes	Average Speed		
			A.M.	P.M.	
North-South Roadway:	Alton	At Grade	8	15	5
East-West Roadway:	Towne Centre Dr.	At Grade	6	15	5

### A.M. Peak Hour Traffic Volumes



### P.M. Peak Hour Traffic Volumes



### Highest Traffic Volumes (Vehicles per Hour)

N-S Road: 3,920                      N-S Road: 4,370  
 E-W Road: 1,500                    E-W Road: 1,840

## Roadway CO Contributions and Concentrations

Emissions = (A x B x C) / 100,000<sup>1</sup>

Roadway	A <sub>1</sub>	A <sub>2</sub>	A <sub>3</sub>	B	C	Estimated CO Concentrations		
	Reference CO Concentrations 25 Feet	50 Feet	100 Feet	Traffic Volume	Emission Factors <sup>2</sup>	25 Feet	50 Feet	100 Feet
<b>A.M. Peak Traffic Hour</b>								
North-South Road	5.7	4.6	3.4	3,920	1.23	0.27	0.22	0.16
East-West Road	2.3	2.0	1.7	1,500	1.23	0.04	0.04	0.03
<b>P.M. Peak Traffic Hour</b>								
North-South Road	5.7	4.6	3.4	4,370	1.65	0.41	0.33	0.25
East-West Road	2.3	2.0	1.7	1,840	1.65	0.07	0.06	0.05

<sup>1</sup> Methodology from Bay Area Air Quality Management District *BAAQMD CEQA Guidelines* (1996).

<sup>2</sup> Emission factors from EMFAC2002 (2003).

## Total Roadway CO Concentrations

Peak Hour Emissions = North-South Concentration + East-West Concentration + Background 1-hour Concentration<sup>2</sup>

8-Hour Emissions = ((Highest Peak Hour Concentration - Background 1-hour Concentration) x Persistence Factor) + Background 8-hour Concentration

	A.M. Peak Hour	P.M. Peak Hour	8-Hour
25 Feet from Roadway Edge	3.3	3.5	1.9
50 Feet from Roadway Edge	3.3	3.4	1.8
100 Feet from Roadway Edge	3.2	3.3	1.7

<sup>2</sup> Methodology from Bay Area Air Quality Management District *BAAQMD CEQA Guidelines* (1996).

# SIMPLIFIED CALINE4 CARBON MONOXIDE ANALYSIS

**Project Number:** 10953-00  
**Project Title:** City of Lake Forest Opportunities Study Program EIR

## Background Information

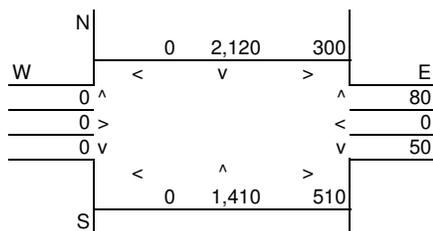
Nearest Air Monitoring Station measuring CO: Mission Viejo - 26081 Via Pera  
 Background 1-hour CO Concentration (ppm): 3.0  
 Background 8-hour CO Concentration (ppm): 1.5  
 Persistence Factor: 0.8  
 Analysis Year: 2030

## Roadway Data

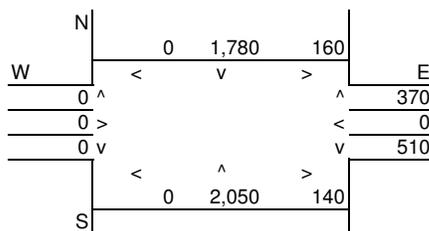
Intersection: Alton & Commercentre  
 Analysis Condition: Year 2030 Traffic Volumes - Existing General Plan

	Roadway Type	No. of Lanes	Average Speed		
			A.M.	P.M.	
North-South Roadway:	Alton	At Grade	8	20	20
East-West Roadway:	Commercentre	At Grade	4	20	20

### A.M. Peak Hour Traffic Volumes



### P.M. Peak Hour Traffic Volumes



### Highest Traffic Volumes (Vehicles per Hour)

N-S Road: 4,090                      N-S Road: 4,480  
 E-W Road: 940                        E-W Road: 1,180

## Roadway CO Contributions and Concentrations

Emissions = (A x B x C) / 100,000<sup>1</sup>

Roadway	A <sub>1</sub>	A <sub>2</sub>	A <sub>3</sub>	B	C	Estimated CO Concentrations		
	Reference CO Concentrations 25 Feet	50 Feet	100 Feet	Traffic Volume	Emission Factors <sup>2</sup>	25 Feet	50 Feet	100 Feet
<b>A.M. Peak Traffic Hour</b>								
North-South Road	5.7	4.6	3.4	4,090	1.09	0.25	0.21	0.15
East-West Road	2.6	2.2	1.7	940	1.09	0.03	0.02	0.02
<b>P.M. Peak Traffic Hour</b>								
North-South Road	5.7	4.6	3.4	4,480	1.09	0.28	0.22	0.17
East-West Road	2.6	2.2	1.7	1,180	1.09	0.03	0.03	0.02

<sup>1</sup> Methodology from Bay Area Air Quality Management District *BAAQMD CEQA Guidelines* (1996).

<sup>2</sup> Emission factors from EMFAC2002 (2003).

## Total Roadway CO Concentrations

Peak Hour Emissions = North-South Concentration + East-West Concentration + Background 1-hour Concentration<sup>2</sup>

8-Hour Emissions = ((Highest Peak Hour Concentration - Background 1-hour Concentration) x Persistence Factor) + Background 8-hour Concentration

	A.M. Peak Hour	P.M. Peak Hour	8-Hour
25 Feet from Roadway Edge	3.3	3.3	1.7
50 Feet from Roadway Edge	3.2	3.3	1.7
100 Feet from Roadway Edge	3.2	3.2	1.7

<sup>2</sup> Methodology from Bay Area Air Quality Management District *BAAQMD CEQA Guidelines* (1996).

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**CO Analysis in Project Area—Proposed Project Build-out**

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# SIMPLIFIED CALINE4 CARBON MONOXIDE ANALYSIS

Project Number: 10953-00  
 Project Title: City of Lake Forest Opportunities Study Program EIR

## Background Information

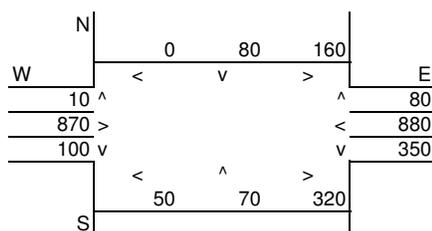
Nearest Air Monitoring Station measuring CO: Mission Viejo - 26081 Via Pera  
 Background 1-hour CO Concentration (ppm): 3.0  
 Background 8-hour CO Concentration (ppm): 1.5  
 Persistence Factor: 0.8  
 Analysis Year: 2030

## Roadway Data

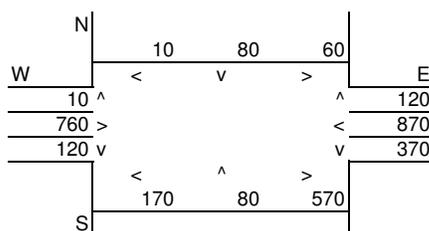
Intersection: Alton & Portola  
 Analysis Condition: Year 2030 Traffic Volumes - Proposed Project

	Roadway Type	No. of Lanes	Average Speed		
			A.M.	P.M.	
North-South Roadway:	Alton	At Grade	8	20	20
East-West Roadway:	Portola	At Grade	8	20	20

### A.M. Peak Hour Traffic Volumes



### P.M. Peak Hour Traffic Volumes



### Highest Traffic Volumes (Vehicles per Hour)

N-S Road: 970  
 E-W Road: 2,660  
 N-S Road: 1,390  
 E-W Road: 2,750

## Roadway CO Contributions and Concentrations

$$\text{Emissions} = (A \times B \times C) / 100,000^1$$

Roadway	A <sub>1</sub>	A <sub>2</sub>	A <sub>3</sub>	B	C	Estimated CO Concentrations		
	Reference CO Concentrations 25 Feet	50 Feet	100 Feet	Traffic Volume	Emission Factors <sup>2</sup>	25 Feet	50 Feet	100 Feet
A.M. Peak Traffic Hour								
North-South Road	2.2	1.9	1.6	970	1.09	0.02	0.02	0.02
East-West Road	5.7	4.6	3.4	2,660	1.09	0.17	0.13	0.10
P.M. Peak Traffic Hour								
North-South Road	2.2	1.9	1.6	1,390	1.09	0.03	0.03	0.02
East-West Road	5.7	4.6	3.4	2,750	1.09	0.17	0.14	0.10

<sup>1</sup> Methodology from Bay Area Air Quality Management District *BAAQMD CEQA Guidelines* (1996).

<sup>2</sup> Emission factors from EMFAC2002 (2003).

## Total Roadway CO Concentrations

$$\text{Peak Hour Emissions} = \text{North-South Concentration} + \text{East-West Concentration} + \text{Background 1-hour Concentration}^2$$

$$\text{8-Hour Emissions} = ((\text{Highest Peak Hour Concentration} - \text{Background 1-hour Concentration}) \times \text{Persistence Factor}) + \text{Background 8-hour Concentration}$$

	A.M. Peak Hour	P.M. Peak Hour	8-Hour
25 Feet from Roadway Edge	3.2	3.2	1.7
50 Feet from Roadway Edge	3.2	3.2	1.6
100 Feet from Roadway Edge	3.1	3.1	1.6

<sup>2</sup> Methodology from Bay Area Air Quality Management District *BAAQMD CEQA Guidelines* (1996).



# SIMPLIFIED CALINE4 CARBON MONOXIDE ANALYSIS

Project Number: 10953-00  
 Project Title: City of Lake Forest Opportunities Study Program EIR

## Background Information

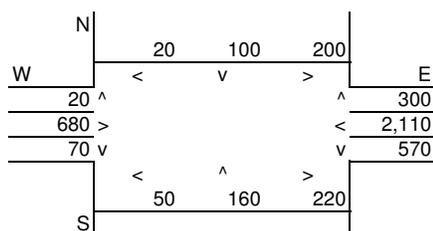
Nearest Air Monitoring Station measuring CO: Mission Viejo - 26081 Via Pera  
 Background 1-hour CO Concentration (ppm): 3.0  
 Background 8-hour CO Concentration (ppm): 1.5  
 Persistence Factor: 0.8  
 Analysis Year: 2030

## Roadway Data

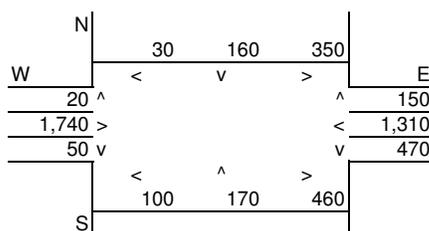
Intersection: Lake Forest & Portola  
 Analysis Condition: Year 2030 Traffic Volumes - Proposed Project

	Roadway Type	No. of Lanes	Average Speed		
			A.M.	P.M.	
North-South Roadway:	Lake Forest	At Grade	8	20	10
East-West Roadway:	Portola	At Grade	8	20	10

### A.M. Peak Hour Traffic Volumes



### P.M. Peak Hour Traffic Volumes



### Highest Traffic Volumes (Vehicles per Hour)

N-S Road: 1,170	N-S Road: 1,410
E-W Road: 4,080	E-W Road: 4,480

## Roadway CO Contributions and Concentrations

$$\text{Emissions} = (A \times B \times C) / 100,000^1$$

Roadway	A <sub>1</sub>	A <sub>2</sub>	A <sub>3</sub>	B	C	Estimated CO Concentrations		
	Reference CO Concentrations 25 Feet	50 Feet	100 Feet	Traffic Volume	Emission Factors <sup>2</sup>	25 Feet	50 Feet	100 Feet
<b>A.M. Peak Traffic Hour</b>								
North-South Road	2.2	1.9	1.6	1,170	1.09	0.03	0.02	0.02
East-West Road	5.7	4.6	3.4	4,080	1.09	0.25	0.20	0.15
<b>P.M. Peak Traffic Hour</b>								
North-South Road	2.2	1.9	1.6	1,410	1.41	0.04	0.04	0.03
East-West Road	5.7	4.6	3.4	4,480	1.41	0.36	0.29	0.21

<sup>1</sup> Methodology from Bay Area Air Quality Management District *BAAQMD CEQA Guidelines* (1996).

<sup>2</sup> Emission factors from EMFAC2002 (2003).

## Total Roadway CO Concentrations

$$\text{Peak Hour Emissions} = \text{North-South Concentration} + \text{East-West Concentration} + \text{Background 1-hour Concentration}^2$$

$$\text{8-Hour Emissions} = ((\text{Highest Peak Hour Concentration} - \text{Background 1-hour Concentration}) \times \text{Persistence Factor}) + \text{Background 8-hour Concentration}$$

	A.M. Peak Hour	P.M. Peak Hour	8-Hour
25 Feet from Roadway Edge	3.3	3.4	1.8
50 Feet from Roadway Edge	3.2	3.3	1.8
100 Feet from Roadway Edge	3.2	3.2	1.7

<sup>2</sup> Methodology from Bay Area Air Quality Management District *BAAQMD CEQA Guidelines* (1996).

# SIMPLIFIED CALINE4 CARBON MONOXIDE ANALYSIS

Project Number: 10953-00  
 Project Title: City of Lake Forest Opportunities Study Program EIR

## Background Information

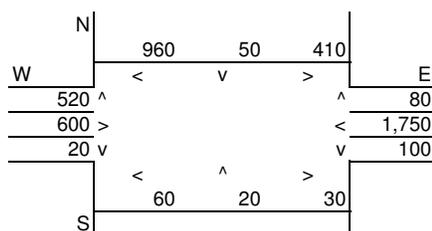
Nearest Air Monitoring Station measuring CO: Mission Viejo - 26081 Via Pera  
 Background 1-hour CO Concentration (ppm): 3.0  
 Background 8-hour CO Concentration (ppm): 1.5  
 Persistence Factor: 0.8  
 Analysis Year: 2030

## Roadway Data

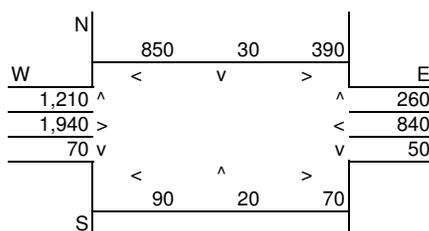
Intersection: Glenn Ranch & Portola  
 Analysis Condition: Year 2030 Traffic Volumes - Proposed Project

	Roadway Type	No. of Lanes	Average Speed		
			A.M.	P.M.	
North-South Roadway:	Glenn Ranch	At Grade	8	20	20
East-West Roadway:	Portola	At Grade	8	20	20

### A.M. Peak Hour Traffic Volumes



### P.M. Peak Hour Traffic Volumes



### Highest Traffic Volumes (Vehicles per Hour)

N-S Road: 2,040	N-S Road: 2,760
E-W Road: 3,910	E-W Road: 5,000

## Roadway CO Contributions and Concentrations

$$\text{Emissions} = (A \times B \times C) / 100,000^1$$

Roadway	Reference CO Concentrations			B Traffic Volume	C Emission Factors <sup>2</sup>	Estimated CO Concentrations		
	A <sub>1</sub> 25 Feet	A <sub>2</sub> 50 Feet	A <sub>3</sub> 100 Feet			25 Feet	50 Feet	100 Feet
A.M. Peak Traffic Hour								
North-South Road	2.2	1.9	1.6	2,040	1.09	0.05	0.04	0.04
East-West Road	5.7	4.6	3.4	3,910	1.09	0.24	0.20	0.14
P.M. Peak Traffic Hour								
North-South Road	2.2	1.9	1.6	2,760	1.09	0.07	0.06	0.05
East-West Road	5.7	4.6	3.4	5,000	1.09	0.31	0.25	0.19

<sup>1</sup> Methodology from Bay Area Air Quality Management District *BAAQMD CEQA Guidelines* (1996).

<sup>2</sup> Emission factors from EMFAC2002 (2003).

## Total Roadway CO Concentrations

$$\text{Peak Hour Emissions} = \text{North-South Concentration} + \text{East-West Concentration} + \text{Background 1-hour Concentration}^2$$

$$\text{8-Hour Emissions} = ((\text{Highest Peak Hour Concentration} - \text{Background 1-hour Concentration}) \times \text{Persistence Factor}) + \text{Background 8-hour Concentration}$$

	A.M. Peak Hour	P.M. Peak Hour	8-Hour
25 Feet from Roadway Edge	3.3	3.4	1.8
50 Feet from Roadway Edge	3.2	3.3	1.7
100 Feet from Roadway Edge	3.2	3.2	1.7

<sup>2</sup> Methodology from Bay Area Air Quality Management District *BAAQMD CEQA Guidelines* (1996).

# SIMPLIFIED CALINE4 CARBON MONOXIDE ANALYSIS

Project Number: 10953-00  
 Project Title: City of Lake Forest Opportunities Study Program EIR

## Background Information

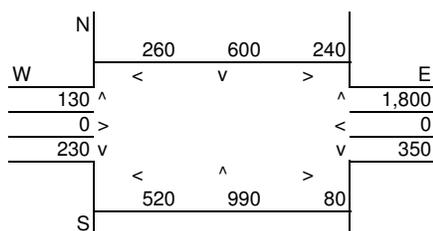
Nearest Air Monitoring Station measuring CO: Mission Viejo - 26081 Via Pera  
 Background 1-hour CO Concentration (ppm): 3.0  
 Background 8-hour CO Concentration (ppm): 1.5  
 Persistence Factor: 0.8  
 Analysis Year: 2030

## Roadway Data

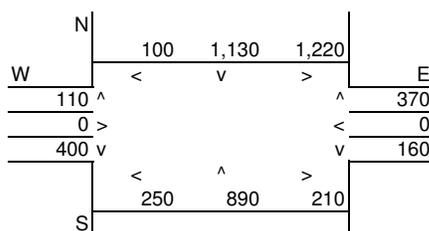
Intersection: Portola & SR-241 Ramps  
 Analysis Condition: Year 2030 Traffic Volumes - Proposed Project

	Roadway Type	No. of Lanes	Average Speed		
			A.M.	P.M.	
North-South Roadway:	Portola	At Grade	8	20	20
East-West Roadway:	SR-241 Ramps	At Grade	4	20	20

### A.M. Peak Hour Traffic Volumes



### P.M. Peak Hour Traffic Volumes



### Highest Traffic Volumes (Vehicles per Hour)

A.M. Peak Hour:  
 N-S Road: 4,020  
 E-W Road: 2,470

P.M. Peak Hour:  
 N-S Road: 3,820  
 E-W Road: 1,960

## Roadway CO Contributions and Concentrations

$$\text{Emissions} = (A \times B \times C) / 100,000^1$$

Roadway	A <sub>1</sub>	A <sub>2</sub>	A <sub>3</sub>	B	C	Estimated CO Concentrations		
	Reference CO Concentrations 25 Feet	50 Feet	100 Feet	Traffic Volume	Emission Factors <sup>2</sup>	25 Feet	50 Feet	100 Feet
<b>A.M. Peak Traffic Hour</b>								
North-South Road	5.7	4.6	3.4	4,020	1.09	0.25	0.20	0.15
East-West Road	2.6	2.2	1.7	2,470	1.09	0.07	0.06	0.05
<b>P.M. Peak Traffic Hour</b>								
North-South Road	5.7	4.6	3.4	3,820	1.09	0.24	0.19	0.14
East-West Road	2.6	2.2	1.7	1,960	1.09	0.06	0.05	0.04

<sup>1</sup> Methodology from Bay Area Air Quality Management District *BAAQMD CEQA Guidelines* (1996).

<sup>2</sup> Emission factors from EMFAC2002 (2003).

## Total Roadway CO Concentrations

$$\text{Peak Hour Emissions} = \text{North-South Concentration} + \text{East-West Concentration} + \text{Background 1-hour Concentration}^2$$

$$\text{8-Hour Emissions} = ((\text{Highest Peak Hour Concentration} - \text{Background 1-hour Concentration}) \times \text{Persistence Factor}) + \text{Background 8-hour Concentration}$$

	A.M. Peak Hour	P.M. Peak Hour	8-Hour
25 Feet from Roadway Edge	3.3	3.3	1.8
50 Feet from Roadway Edge	3.3	3.2	1.7
100 Feet from Roadway Edge	3.2	3.2	1.7

<sup>2</sup> Methodology from Bay Area Air Quality Management District *BAAQMD CEQA Guidelines* (1996).

# SIMPLIFIED CALINE4 CARBON MONOXIDE ANALYSIS

Project Number: 10953-00  
 Project Title: City of Lake Forest Opportunities Study Program EIR

## Background Information

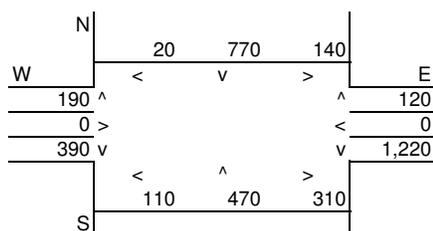
Nearest Air Monitoring Station measuring CO: Mission Viejo - 26081 Via Pera  
 Background 1-hour CO Concentration (ppm): 3.0  
 Background 8-hour CO Concentration (ppm): 1.5  
 Persistence Factor: 0.8  
 Analysis Year: 2030

## Roadway Data

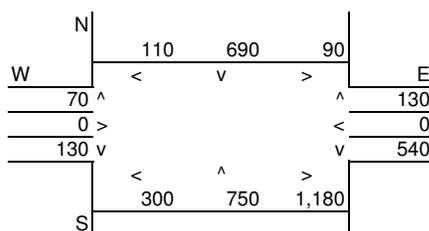
Intersection: Alton & SR-241 Ramps  
 Analysis Condition: Year 2030 Traffic Volumes - Proposed Project

	Roadway Type	No. of Lanes	Average Speed		
			A.M.	P.M.	
North-South Roadway:	Alton	At Grade	8	20	20
East-West Roadway:	SR-241 Ramps	At Grade	4	20	20

### A.M. Peak Hour Traffic Volumes



### P.M. Peak Hour Traffic Volumes



### Highest Traffic Volumes (Vehicles per Hour)

N-S Road: 3,270                      N-S Road: 3,590  
 E-W Road: 1,790                      E-W Road: 1,940

## Roadway CO Contributions and Concentrations

Emissions = (A x B x C) / 100,000<sup>1</sup>

Roadway	A <sub>1</sub>	A <sub>2</sub>	A <sub>3</sub>	B	C	Estimated CO Concentrations		
	Reference CO Concentrations 25 Feet	50 Feet	100 Feet	Traffic Volume	Emission Factors <sup>2</sup>	25 Feet	50 Feet	100 Feet
A.M. Peak Traffic Hour								
North-South Road	5.7	4.6	3.4	3,270	1.09	0.20	0.16	0.12
East-West Road	2.6	2.2	1.7	1,790	1.09	0.05	0.04	0.03
P.M. Peak Traffic Hour								
North-South Road	5.7	4.6	3.4	3,590	1.09	0.22	0.18	0.13
East-West Road	2.6	2.2	1.7	1,940	1.09	0.05	0.05	0.04

<sup>1</sup> Methodology from Bay Area Air Quality Management District *BAAQMD CEQA Guidelines* (1996).

<sup>2</sup> Emission factors from EMFAC2002 (2003).

## Total Roadway CO Concentrations

Peak Hour Emissions = North-South Concentration + East-West Concentration + Background 1-hour Concentration<sup>2</sup>

8-Hour Emissions = ((Highest Peak Hour Concentration - Background 1-hour Concentration) x Persistence Factor) + Background 8-hour Concentration

	A.M. Peak Hour	P.M. Peak Hour	8-Hour
25 Feet from Roadway Edge	3.3	3.3	1.7
50 Feet from Roadway Edge	3.2	3.2	1.7
100 Feet from Roadway Edge	3.2	3.2	1.6

<sup>2</sup> Methodology from Bay Area Air Quality Management District *BAAQMD CEQA Guidelines* (1996).

# SIMPLIFIED CALINE4 CARBON MONOXIDE ANALYSIS

**Project Number:** 10953-00  
**Project Title:** City of Lake Forest Opportunities Study Program EIR

## Background Information

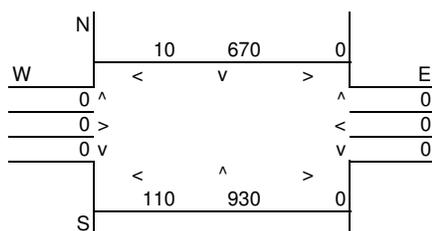
Nearest Air Monitoring Station measuring CO: Mission Viejo - 26081 Via Pera  
 Background 1-hour CO Concentration (ppm): 3.0  
 Background 8-hour CO Concentration (ppm): 1.5  
 Persistence Factor: 0.8  
 Analysis Year: 2030

## Roadway Data

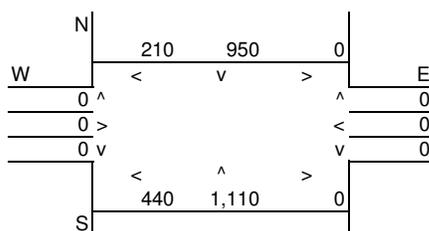
Intersection: Lake Forest & SR-241 NB  
 Analysis Condition: Year 2030 Traffic Volumes - Proposed Project

	Roadway Type	No. of Lanes	Average Speed		
			A.M.	P.M.	
North-South Roadway:	Lake Forest	At Grade	8	20	20
East-West Roadway:	SR-241 NB	At Grade	2	20	20

### A.M. Peak Hour Traffic Volumes



### P.M. Peak Hour Traffic Volumes



### Highest Traffic Volumes (Vehicles per Hour)

N-S Road:	1,710	N-S Road:	2,500
E-W Road:	120	E-W Road:	650

## Roadway CO Contributions and Concentrations

Emissions = (A x B x C) / 100,000<sup>1</sup>

Roadway	A <sub>1</sub>	A <sub>2</sub>	A <sub>3</sub>	B	C	Estimated CO Concentrations		
	Reference CO Concentrations 25 Feet	50 Feet	100 Feet	Traffic Volume	Emission Factors <sup>2</sup>	25 Feet	50 Feet	100 Feet
<b>A.M. Peak Traffic Hour</b>								
North-South Road	5.7	4.6	3.4	1,710	1.09	0.11	0.09	0.06
East-West Road	2.7	2.2	1.7	120	1.09	0.00	0.00	0.00
<b>P.M. Peak Traffic Hour</b>								
North-South Road	5.7	4.6	3.4	2,500	1.09	0.16	0.13	0.09
East-West Road	2.7	2.2	1.7	650	1.09	0.02	0.02	0.01

<sup>1</sup> Methodology from Bay Area Air Quality Management District *BAAQMD CEQA Guidelines* (1996).

<sup>2</sup> Emission factors from EMFAC2002 (2003).

## Total Roadway CO Concentrations

Peak Hour Emissions = North-South Concentration + East-West Concentration + Background 1-hour Concentration<sup>2</sup>

8-Hour Emissions = ((Highest Peak Hour Concentration - Background 1-hour Concentration) x Persistence Factor) + Background 8-hour Concentration

	A.M. Peak Hour	P.M. Peak Hour	8-Hour
25 Feet from Roadway Edge	3.1	3.2	1.6
50 Feet from Roadway Edge	3.1	3.1	1.6
100 Feet from Roadway Edge	3.1	3.1	1.6

<sup>2</sup> Methodology from Bay Area Air Quality Management District *BAAQMD CEQA Guidelines* (1996).

# SIMPLIFIED CALINE4 CARBON MONOXIDE ANALYSIS

Project Number: 10953-00  
 Project Title: City of Lake Forest Opportunities Study Program EIR

## Background Information

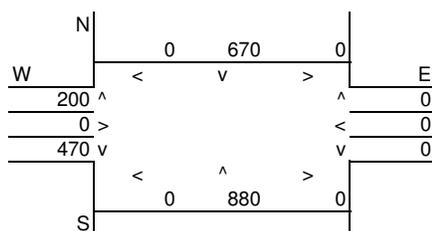
Nearest Air Monitoring Station measuring CO: Mission Viejo - 26081 Via Pera  
 Background 1-hour CO Concentration (ppm): 3.0  
 Background 8-hour CO Concentration (ppm): 1.5  
 Persistence Factor: 0.8  
 Analysis Year: 2030

## Roadway Data

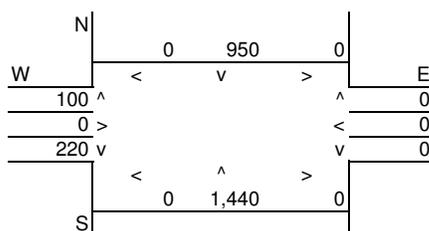
Intersection: Lake Forest & SR-241 SB  
 Analysis Condition: Year 2030 Traffic Volumes - Proposed Project

	Roadway Type	No. of Lanes	Average Speed		
			A.M.	P.M.	
North-South Roadway:	Lake Forest	At Grade	4	20	20
East-West Roadway:	SR-241 SB	At Grade	4	20	20

### A.M. Peak Hour Traffic Volumes



### P.M. Peak Hour Traffic Volumes



### Highest Traffic Volumes (Vehicles per Hour)

N-S Road:	2,020	N-S Road:	2,610
E-W Road:	670	E-W Road:	320

## Roadway CO Contributions and Concentrations

$$\text{Emissions} = (A \times B \times C) / 100,000^1$$

Roadway	Reference CO Concentrations			B Traffic Volume	C Emission Factors <sup>2</sup>	Estimated CO Concentrations		
	A <sub>1</sub> 25 Feet	A <sub>2</sub> 50 Feet	A <sub>3</sub> 100 Feet			25 Feet	50 Feet	100 Feet
A.M. Peak Traffic Hour								
North-South Road	7.0	5.4	3.8	2,020	1.09	0.15	0.12	0.08
East-West Road	2.6	2.2	1.7	670	1.09	0.02	0.02	0.01
P.M. Peak Traffic Hour								
North-South Road	7.0	5.4	3.8	2,610	1.09	0.20	0.15	0.11
East-West Road	2.6	2.2	1.7	320	1.09	0.01	0.01	0.01

<sup>1</sup> Methodology from Bay Area Air Quality Management District *BAAQMD CEQA Guidelines* (1996).

<sup>2</sup> Emission factors from EMFAC2002 (2003).

## Total Roadway CO Concentrations

$$\text{Peak Hour Emissions} = \text{North-South Concentration} + \text{East-West Concentration} + \text{Background 1-hour Concentration}^2$$

$$\text{8-Hour Emissions} = ((\text{Highest Peak Hour Concentration} - \text{Background 1-hour Concentration}) \times \text{Persistence Factor}) + \text{Background 8-hour Concentration}$$

	A.M. Peak Hour	P.M. Peak Hour	8-Hour
25 Feet from Roadway Edge	3.2	3.2	1.7
50 Feet from Roadway Edge	3.1	3.2	1.6
100 Feet from Roadway Edge	3.1	3.1	1.6

<sup>2</sup> Methodology from Bay Area Air Quality Management District *BAAQMD CEQA Guidelines* (1996).

# SIMPLIFIED CALINE4 CARBON MONOXIDE ANALYSIS

Project Number: 10953-00  
 Project Title: City of Lake Forest Opportunities Study Program EIR

## Background Information

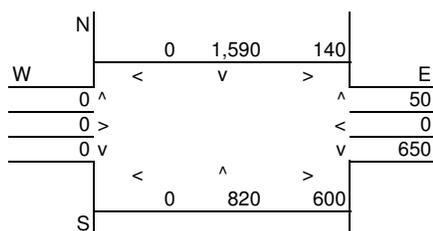
Nearest Air Monitoring Station measuring CO: Mission Viejo - 26081 Via Pera  
 Background 1-hour CO Concentration (ppm): 3.0  
 Background 8-hour CO Concentration (ppm): 1.5  
 Persistence Factor: 0.8  
 Analysis Year: 2030

## Roadway Data

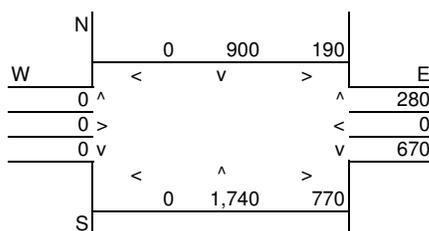
Intersection: Bake & Rancho North  
 Analysis Condition: Year 2030 Traffic Volumes - Proposed Project

	Roadway Type	No. of Lanes	Average Speed		
			A.M.	P.M.	
North-South Roadway:	Bake	At Grade	6	20	15
East-West Roadway:	Rancho North	At Grade	4	20	15

### A.M. Peak Hour Traffic Volumes



### P.M. Peak Hour Traffic Volumes



### Highest Traffic Volumes (Vehicles per Hour)

N-S Road:	3,660	N-S Road:	4,080
E-W Road:	1,440	E-W Road:	1,910

## Roadway CO Contributions and Concentrations

$$\text{Emissions} = (A \times B \times C) / 100,000^1$$

Roadway	A <sub>1</sub>	A <sub>2</sub>	A <sub>3</sub>	B	C	Estimated CO Concentrations		
	Reference CO Concentrations 25 Feet	50 Feet	100 Feet	Traffic Volume	Emission Factors <sup>2</sup>	25 Feet	50 Feet	100 Feet
A.M. Peak Traffic Hour								
North-South Road	6.1	4.9	3.5	3,660	1.09	0.24	0.20	0.14
East-West Road	2.6	2.2	1.7	1,440	1.09	0.04	0.03	0.03
P.M. Peak Traffic Hour								
North-South Road	6.1	4.9	3.5	4,080	1.23	0.31	0.25	0.18
East-West Road	2.6	2.2	1.7	1,910	1.23	0.06	0.05	0.04

<sup>1</sup> Methodology from Bay Area Air Quality Management District *BAAQMD CEQA Guidelines* (1996).

<sup>2</sup> Emission factors from EMFAC2002 (2003).

## Total Roadway CO Concentrations

$$\text{Peak Hour Emissions} = \text{North-South Concentration} + \text{East-West Concentration} + \text{Background 1-hour Concentration}^2$$

$$\text{8-Hour Emissions} = ((\text{Highest Peak Hour Concentration} - \text{Background 1-hour Concentration}) \times \text{Persistence Factor}) + \text{Background 8-hour Concentration}$$

	A.M. Peak Hour	P.M. Peak Hour	8-Hour
25 Feet from Roadway Edge	3.3	3.4	1.8
50 Feet from Roadway Edge	3.2	3.3	1.7
100 Feet from Roadway Edge	3.2	3.2	1.7

<sup>2</sup> Methodology from Bay Area Air Quality Management District *BAAQMD CEQA Guidelines* (1996).

# SIMPLIFIED CALINE4 CARBON MONOXIDE ANALYSIS

Project Number: 10953-00  
 Project Title: City of Lake Forest Opportunities Study Program EIR

## Background Information

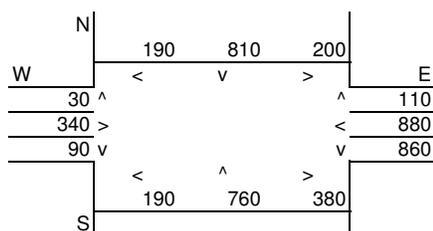
Nearest Air Monitoring Station measuring CO: Mission Viejo - 26081 Via Pera  
 Background 1-hour CO Concentration (ppm): 3.0  
 Background 8-hour CO Concentration (ppm): 1.5  
 Persistence Factor: 0.8  
 Analysis Year: 2030

## Roadway Data

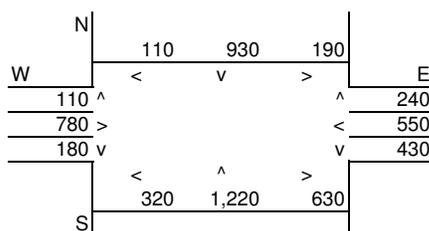
Intersection: Lake Forest & Rancho  
 Analysis Condition: Year 2030 Traffic Volumes - Proposed Project

	Roadway Type	No. of Lanes	Average Speed		
			A.M.	P.M.	
North-South Roadway:	Lake Forest	At Grade	8	10	5
East-West Roadway:	Rancho	At Grade	8	10	5

### A.M. Peak Hour Traffic Volumes



### P.M. Peak Hour Traffic Volumes



### Highest Traffic Volumes (Vehicles per Hour)

N-S Road: 3,090                      N-S Road: 3,710  
 E-W Road: 2,770                      E-W Road: 2,820

## Roadway CO Contributions and Concentrations

$$\text{Emissions} = (A \times B \times C) / 100,000^1$$

Roadway	A <sub>1</sub>	A <sub>2</sub>	A <sub>3</sub>	B	C	Estimated CO Concentrations		
	Reference CO Concentrations 25 Feet	50 Feet	100 Feet	Traffic Volume	Emission Factors <sup>2</sup>	25 Feet	50 Feet	100 Feet
<b>A.M. Peak Traffic Hour</b>								
North-South Road	5.7	4.6	3.4	3,090	1.41	0.25	0.20	0.15
East-West Road	2.2	1.9	1.6	2,770	1.41	0.09	0.07	0.06
<b>P.M. Peak Traffic Hour</b>								
North-South Road	5.7	4.6	3.4	3,710	1.65	0.35	0.28	0.21
East-West Road	2.2	1.9	1.6	2,820	1.65	0.10	0.09	0.07

<sup>1</sup> Methodology from Bay Area Air Quality Management District *BAAQMD CEQA Guidelines* (1996).

<sup>2</sup> Emission factors from EMFAC2002 (2003).

## Total Roadway CO Concentrations

$$\text{Peak Hour Emissions} = \text{North-South Concentration} + \text{East-West Concentration} + \text{Background 1-hour Concentration}^2$$

$$\text{8-Hour Emissions} = ((\text{Highest Peak Hour Concentration} - \text{Background 1-hour Concentration}) \times \text{Persistence Factor}) + \text{Background 8-hour Concentration}$$

	A.M. Peak Hour	P.M. Peak Hour	8-Hour
25 Feet from Roadway Edge	3.3	3.5	1.9
50 Feet from Roadway Edge	3.3	3.4	1.8
100 Feet from Roadway Edge	3.2	3.3	1.7

<sup>2</sup> Methodology from Bay Area Air Quality Management District *BAAQMD CEQA Guidelines* (1996).

# SIMPLIFIED CALINE4 CARBON MONOXIDE ANALYSIS

**Project Number:** 10953-00  
**Project Title:** City of Lake Forest Opportunities Study Program EIR

## Background Information

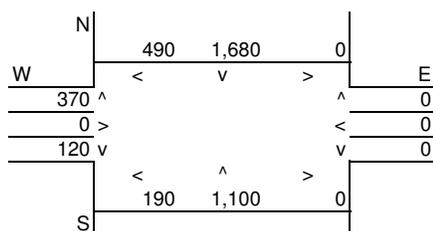
Nearest Air Monitoring Station measuring CO: Mission Viejo - 26081 Via Pera  
 Background 1-hour CO Concentration (ppm): 3.0  
 Background 8-hour CO Concentration (ppm): 1.5  
 Persistence Factor: 0.8  
 Analysis Year: 2030

## Roadway Data

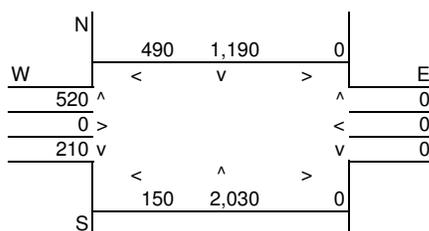
Intersection: Bake & Rancho South  
 Analysis Condition: Year 2030 Traffic Volumes - Proposed Project

	Roadway Type	No. of Lanes	Average Speed		
			A.M.	P.M.	
North-South Roadway:	Bake	At Grade	6	20	20
East-West Roadway:	Rancho South	At Grade	4	20	20

### A.M. Peak Hour Traffic Volumes



### P.M. Peak Hour Traffic Volumes



### Highest Traffic Volumes (Vehicles per Hour)

N-S Road: 3,640                      N-S Road: 4,230  
 E-W Road: 1,170                      E-W Road: 1,370

## Roadway CO Contributions and Concentrations

Emissions = (A x B x C) / 100,000<sup>1</sup>

Roadway	A <sub>1</sub>	A <sub>2</sub>	A <sub>3</sub>	B	C	Estimated CO Concentrations		
	Reference CO Concentrations 25 Feet	50 Feet	100 Feet	Traffic Volume	Emission Factors <sup>2</sup>	25 Feet	50 Feet	100 Feet
<b>A.M. Peak Traffic Hour</b>								
North-South Road	6.1	4.9	3.5	3,640	1.09	0.24	0.19	0.14
East-West Road	2.6	2.2	1.7	1,170	1.09	0.03	0.03	0.02
<b>P.M. Peak Traffic Hour</b>								
North-South Road	6.1	4.9	3.5	4,230	1.09	0.28	0.23	0.16
East-West Road	2.6	2.2	1.7	1,370	1.09	0.04	0.03	0.03

<sup>1</sup> Methodology from Bay Area Air Quality Management District *BAAQMD CEQA Guidelines* (1996).

<sup>2</sup> Emission factors from EMFAC2002 (2003).

## Total Roadway CO Concentrations

Peak Hour Emissions = North-South Concentration + East-West Concentration + Background 1-hour Concentration<sup>2</sup>

8-Hour Emissions = ((Highest Peak Hour Concentration - Background 1-hour Concentration) x Persistence Factor) + Background 8-hour Concentration

	A.M. Peak Hour	P.M. Peak Hour	8-Hour
25 Feet from Roadway Edge	3.3	3.3	1.8
50 Feet from Roadway Edge	3.2	3.3	1.7
100 Feet from Roadway Edge	3.2	3.2	1.6

<sup>2</sup> Methodology from Bay Area Air Quality Management District *BAAQMD CEQA Guidelines* (1996).



# SIMPLIFIED CALINE4 CARBON MONOXIDE ANALYSIS

Project Number: 10953-00  
 Project Title: City of Lake Forest Opportunities Study Program EIR

## Background Information

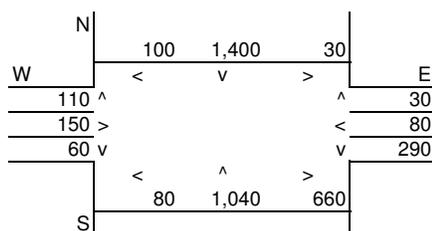
Nearest Air Monitoring Station measuring CO: Mission Viejo - 26081 Via Pera  
 Background 1-hour CO Concentration (ppm): 3.0  
 Background 8-hour CO Concentration (ppm): 1.5  
 Persistence Factor: 0.8  
 Analysis Year: 2030

## Roadway Data

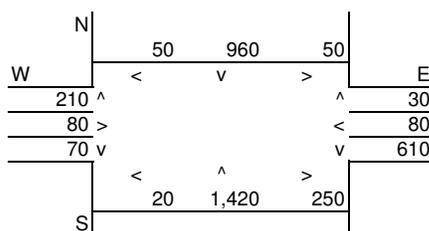
Intersection: Bake & Commercentre  
 Analysis Condition: Year 2030 Traffic Volumes - Proposed Project

	Roadway Type	No. of Lanes	Average Speed		
			A.M.	P.M.	
North-South Roadway:	Bake	At Grade	8	20	20
East-West Roadway:	Commercentre	At Grade	6	20	20

### A.M. Peak Hour Traffic Volumes



### P.M. Peak Hour Traffic Volumes



### Highest Traffic Volumes (Vehicles per Hour)

N-S Road: 3,530  
 E-W Road: 1,240

N-S Road: 3,330  
 E-W Road: 1,100

## Roadway CO Contributions and Concentrations

$$\text{Emissions} = (A \times B \times C) / 100,000^1$$

Roadway	A <sub>1</sub>	A <sub>2</sub>	A <sub>3</sub>	B	C	Estimated CO Concentrations		
	Reference CO Concentrations 25 Feet	50 Feet	100 Feet	Traffic Volume	Emission Factors <sup>2</sup>	25 Feet	50 Feet	100 Feet
A.M. Peak Traffic Hour								
North-South Road	5.7	4.6	3.4	3,530	1.09	0.22	0.18	0.13
East-West Road	2.3	2.0	1.7	1,240	1.09	0.03	0.03	0.02
P.M. Peak Traffic Hour								
North-South Road	5.7	4.6	3.4	3,330	1.09	0.21	0.17	0.12
East-West Road	2.3	2.0	1.7	1,100	1.09	0.03	0.02	0.02

<sup>1</sup> Methodology from Bay Area Air Quality Management District *BAAQMD CEQA Guidelines* (1996).

<sup>2</sup> Emission factors from EMFAC2002 (2003).

## Total Roadway CO Concentrations

$$\text{Peak Hour Emissions} = \text{North-South Concentration} + \text{East-West Concentration} + \text{Background 1-hour Concentration}^2$$

$$\text{8-Hour Emissions} = ((\text{Highest Peak Hour Concentration} - \text{Background 1-hour Concentration}) \times \text{Persistence Factor}) + \text{Background 8-hour Concentration}$$

	A.M. Peak Hour	P.M. Peak Hour	8-Hour
25 Feet from Roadway Edge	3.3	3.2	1.7
50 Feet from Roadway Edge	3.2	3.2	1.7
100 Feet from Roadway Edge	3.2	3.1	1.6

<sup>2</sup> Methodology from Bay Area Air Quality Management District *BAAQMD CEQA Guidelines* (1996).

# SIMPLIFIED CALINE4 CARBON MONOXIDE ANALYSIS

Project Number: 10953-00  
 Project Title: City of Lake Forest Opportunities Study Program EIR

## Background Information

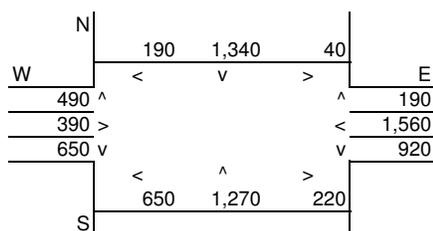
Nearest Air Monitoring Station measuring CO: Mission Viejo - 26081 Via Pera  
 Background 1-hour CO Concentration (ppm): 3.0  
 Background 8-hour CO Concentration (ppm): 1.5  
 Persistence Factor: 0.8  
 Analysis Year: 2030

## Roadway Data

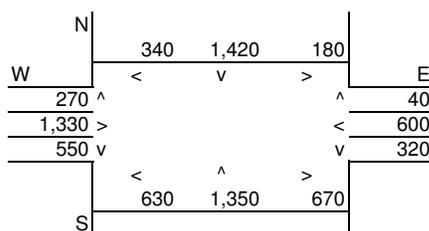
Intersection: Bake & Irvine/Trabuco  
 Analysis Condition: Year 2030 Traffic Volumes - Proposed Project

	Roadway Type	No. of Lanes	Average Speed		
			A.M.	P.M.	
North-South Roadway:	Bake	At Grade	8	5	5
East-West Roadway:	Irvine/Trabuco	At Grade	8	5	5

### A.M. Peak Hour Traffic Volumes



### P.M. Peak Hour Traffic Volumes



### Highest Traffic Volumes (Vehicles per Hour)

N-S Road: 5,050                      N-S Road: 4,940  
 E-W Road: 3,930                      E-W Road: 3,720

## Roadway CO Contributions and Concentrations

Emissions = (A x B x C) / 100,000<sup>1</sup>

Roadway	A <sub>1</sub>	A <sub>2</sub>	A <sub>3</sub>	B	C	Estimated CO Concentrations		
	Reference CO Concentrations 25 Feet	50 Feet	100 Feet	Traffic Volume	Emission Factors <sup>2</sup>	25 Feet	50 Feet	100 Feet
<b>A.M. Peak Traffic Hour</b>								
North-South Road	5.7	4.6	3.4	5,050	1.65	0.47	0.38	0.28
East-West Road	2.2	1.9	1.6	3,930	1.65	0.14	0.12	0.10
<b>P.M. Peak Traffic Hour</b>								
North-South Road	5.7	4.6	3.4	4,940	1.65	0.46	0.37	0.28
East-West Road	2.2	1.9	1.6	3,720	1.65	0.14	0.12	0.10

<sup>1</sup> Methodology from Bay Area Air Quality Management District *BAAQMD CEQA Guidelines* (1996).

<sup>2</sup> Emission factors from EMFAC2002 (2003).

## Total Roadway CO Concentrations

Peak Hour Emissions = North-South Concentration + East-West Concentration + Background 1-hour Concentration<sup>2</sup>

8-Hour Emissions = ((Highest Peak Hour Concentration - Background 1-hour Concentration) x Persistence Factor) + Background 8-hour Concentration

	A.M. Peak Hour	P.M. Peak Hour	8-Hour
25 Feet from Roadway Edge	3.6	3.6	2.0
50 Feet from Roadway Edge	3.5	3.5	1.9
100 Feet from Roadway Edge	3.4	3.4	1.8

<sup>2</sup> Methodology from Bay Area Air Quality Management District *BAAQMD CEQA Guidelines* (1996).

# SIMPLIFIED CALINE4 CARBON MONOXIDE ANALYSIS

**Project Number:** 10953-00  
**Project Title:** City of Lake Forest Opportunities Study Program EIR

## Background Information

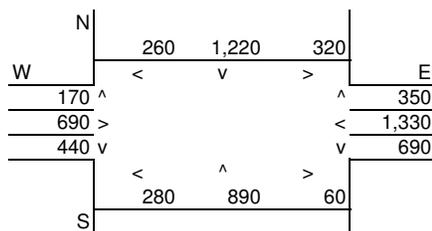
Nearest Air Monitoring Station measuring CO: Mission Viejo - 26081 Via Pera  
 Background 1-hour CO Concentration (ppm): 3.0  
 Background 8-hour CO Concentration (ppm): 1.5  
 Persistence Factor: 0.8  
 Analysis Year: 2030

## Roadway Data

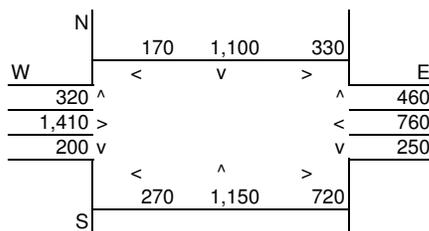
Intersection: Lake Forest & Trabuco  
 Analysis Condition: Year 2030 Traffic Volumes - Proposed Project

	Roadway Type	No. of Lanes	Average Speed		
			A.M.	P.M.	
North-South Roadway:	Lake Forest	At Grade	8	15	15
East-West Roadway:	Trabuco	At Grade	8	15	15

### A.M. Peak Hour Traffic Volumes



### P.M. Peak Hour Traffic Volumes



### Highest Traffic Volumes (Vehicles per Hour)

N-S Road: 3,580                      N-S Road: 3,690  
 E-W Road: 3,440                      E-W Road: 3,930

## Roadway CO Contributions and Concentrations

Emissions = (A x B x C) / 100,000<sup>1</sup>

Roadway	A <sub>1</sub>	A <sub>2</sub>	A <sub>3</sub>	B	C	Estimated CO Concentrations		
	Reference CO Concentrations 25 Feet	50 Feet	100 Feet	Traffic Volume	Emission Factors <sup>2</sup>	25 Feet	50 Feet	100 Feet
<b>A.M. Peak Traffic Hour</b>								
North-South Road	5.7	4.6	3.4	3,580	1.23	0.25	0.20	0.15
East-West Road	2.2	1.9	1.6	3,440	1.23	0.09	0.08	0.07
<b>P.M. Peak Traffic Hour</b>								
North-South Road	2.2	1.9	1.6	3,690	1.23	0.10	0.09	0.07
East-West Road	5.7	4.6	3.4	3,930	1.23	0.28	0.22	0.16

<sup>1</sup> Methodology from Bay Area Air Quality Management District *BAAQMD CEQA Guidelines* (1996).

<sup>2</sup> Emission factors from EMFAC2002 (2003).

## Total Roadway CO Concentrations

Peak Hour Emissions = North-South Concentration + East-West Concentration + Background 1-hour Concentration<sup>2</sup>

8-Hour Emissions = ((Highest Peak Hour Concentration - Background 1-hour Concentration) x Persistence Factor) + Background 8-hour Concentration

	A.M. Peak Hour	P.M. Peak Hour	8-Hour
25 Feet from Roadway Edge	3.3	3.4	1.8
50 Feet from Roadway Edge	3.3	3.3	1.7
100 Feet from Roadway Edge	3.2	3.2	1.7

<sup>2</sup> Methodology from Bay Area Air Quality Management District *BAAQMD CEQA Guidelines* (1996).

# SIMPLIFIED CALINE4 CARBON MONOXIDE ANALYSIS

**Project Number:** 10953-00  
**Project Title:** City of Lake Forest Opportunities Study Program EIR

## Background Information

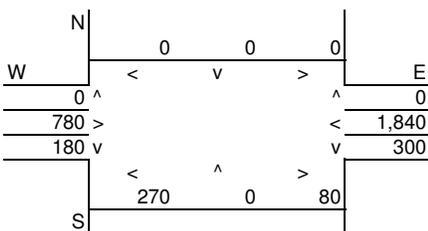
Nearest Air Monitoring Station measuring CO: Mission Viejo - 26081 Via Pera  
 Background 1-hour CO Concentration (ppm): 3.0  
 Background 8-hour CO Concentration (ppm): 1.5  
 Persistence Factor: 0.8  
 Analysis Year: 2030

## Roadway Data

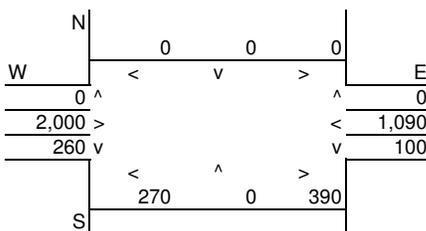
Intersection: Ridge Route & Trabuco  
 Analysis Condition: Year 2030 Traffic Volumes - Proposed Project

	Roadway Type	No. of Lanes	Average Speed	
			A.M.	P.M.
North-South Roadway:	Lake Forest	At Grade	20	20
East-West Roadway:	Trabuco	At Grade	20	20

### A.M. Peak Hour Traffic Volumes



### P.M. Peak Hour Traffic Volumes



### Highest Traffic Volumes (Vehicles per Hour)

N-S Road:	830	N-S Road:	1,020
E-W Road:	3,070	E-W Road:	3,620

## Roadway CO Contributions and Concentrations

Emissions = (A x B x C) / 100,000<sup>1</sup>

Roadway	A <sub>1</sub>	A <sub>2</sub>	A <sub>3</sub>	B	C	Estimated CO Concentrations		
	Reference CO Concentrations 25 Feet	50 Feet	100 Feet	Traffic Volume	Emission Factors <sup>2</sup>	25 Feet	50 Feet	100 Feet
<b>A.M. Peak Traffic Hour</b>								
North-South Road	2.7	2.2	1.7	830	1.09	0.02	0.02	0.02
East-West Road	5.7	4.6	3.4	3,070	1.09	0.19	0.15	0.11
<b>P.M. Peak Traffic Hour</b>								
North-South Road	2.7	2.2	1.7	1,020	1.09	0.03	0.02	0.02
East-West Road	5.7	4.6	3.4	3,620	1.09	0.22	0.18	0.13

<sup>1</sup> Methodology from Bay Area Air Quality Management District *BAAQMD CEQA Guidelines* (1996).

<sup>2</sup> Emission factors from EMFAC2002 (2003).

## Total Roadway CO Concentrations

Peak Hour Emissions = North-South Concentration + East-West Concentration + Background 1-hour Concentration<sup>2</sup>

8-Hour Emissions = ((Highest Peak Hour Concentration - Background 1-hour Concentration) x Persistence Factor) + Background 8-hour Concentration

	A.M. Peak Hour	P.M. Peak Hour	8-Hour
25 Feet from Roadway Edge	3.2	3.3	1.7
50 Feet from Roadway Edge	3.2	3.2	1.7
100 Feet from Roadway Edge	3.1	3.2	1.6

<sup>2</sup> Methodology from Bay Area Air Quality Management District *BAAQMD CEQA Guidelines* (1996).

# SIMPLIFIED CALINE4 CARBON MONOXIDE ANALYSIS

Project Number: 10953-00  
 Project Title: City of Lake Forest Opportunities Study Program EIR

## Background Information

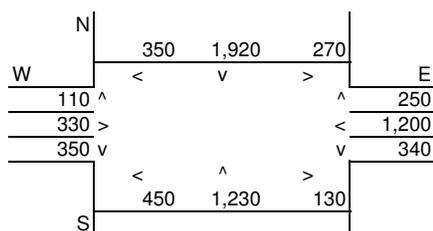
Nearest Air Monitoring Station measuring CO: Mission Viejo - 26081 Via Pera  
 Background 1-hour CO Concentration (ppm): 3.0  
 Background 8-hour CO Concentration (ppm): 1.5  
 Persistence Factor: 0.8  
 Analysis Year: 2030

## Roadway Data

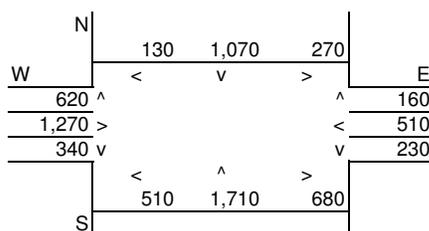
Intersection: El Toro & Trabuco  
 Analysis Condition: Year 2030 Traffic Volumes - Proposed Project

	Roadway Type	No. of Lanes	Average Speed		
			A.M.	P.M.	
North-South Roadway:	El Toro	At Grade	8	15	10
East-West Roadway:	Trabuco	At Grade	8	15	10

### A.M. Peak Hour Traffic Volumes



### P.M. Peak Hour Traffic Volumes



### Highest Traffic Volumes (Vehicles per Hour)

N-S Road: 4,420                      N-S Road: 4,540  
 E-W Road: 2,790                      E-W Road: 3,380

## Roadway CO Contributions and Concentrations

Emissions = (A x B x C) / 100,000<sup>1</sup>

Roadway	A <sub>1</sub>	A <sub>2</sub>	A <sub>3</sub>	B	C	Estimated CO Concentrations		
	Reference CO Concentrations 25 Feet	50 Feet	100 Feet	Traffic Volume	Emission Factors <sup>2</sup>	25 Feet	50 Feet	100 Feet
<b>A.M. Peak Traffic Hour</b>								
North-South Road	5.7	4.6	3.4	4,420	1.23	0.31	0.25	0.18
East-West Road	2.2	1.9	1.6	2,790	1.23	0.08	0.07	0.05
<b>P.M. Peak Traffic Hour</b>								
North-South Road	5.7	4.6	3.4	4,540	1.41	0.36	0.29	0.22
East-West Road	2.2	1.9	1.6	3,380	1.41	0.10	0.09	0.08

<sup>1</sup> Methodology from Bay Area Air Quality Management District *BAAQMD CEQA Guidelines* (1996).

<sup>2</sup> Emission factors from EMFAC2002 (2003).

## Total Roadway CO Concentrations

Peak Hour Emissions = North-South Concentration + East-West Concentration + Background 1-hour Concentration<sup>2</sup>

8-Hour Emissions = ((Highest Peak Hour Concentration - Background 1-hour Concentration) x Persistence Factor) + Background 8-hour Concentration

	A.M. Peak Hour	P.M. Peak Hour	8-Hour
25 Feet from Roadway Edge	3.4	3.5	1.9
50 Feet from Roadway Edge	3.3	3.4	1.8
100 Feet from Roadway Edge	3.2	3.3	1.7

<sup>2</sup> Methodology from Bay Area Air Quality Management District *BAAQMD CEQA Guidelines* (1996).

# SIMPLIFIED CALINE4 CARBON MONOXIDE ANALYSIS

**Project Number:** 10953-00  
**Project Title:** City of Lake Forest Opportunities Study Program EIR

## Background Information

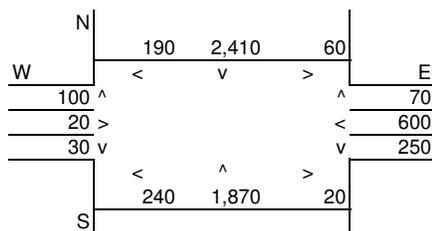
Nearest Air Monitoring Station measuring CO: Mission Viejo - 26081 Via Pera  
 Background 1-hour CO Concentration (ppm): 3.0  
 Background 8-hour CO Concentration (ppm): 1.5  
 Persistence Factor: 0.8  
 Analysis Year: 2030

## Roadway Data

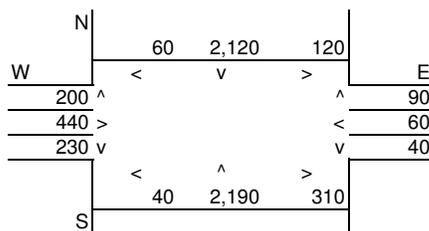
Intersection: Bake & Toledo  
 Analysis Condition: Year 2030 Traffic Volumes - Proposed Project

	Roadway Type	No. of Lanes	Average Speed		
			A.M.	P.M.	
North-South Roadway:	Bake	At Grade	8	15	20
East-West Roadway:	Toledo	At Grade	8	15	20

### A.M. Peak Hour Traffic Volumes



### P.M. Peak Hour Traffic Volumes



### Highest Traffic Volumes (Vehicles per Hour)

N-S Road:	4,820	N-S Road:	4,930
E-W Road:	1,180	E-W Road:	1,060

## Roadway CO Contributions and Concentrations

Emissions = (A x B x C) / 100,000<sup>1</sup>

Roadway	A <sub>1</sub>	A <sub>2</sub>	A <sub>3</sub>	B	C	Estimated CO Concentrations		
	Reference CO Concentrations 25 Feet	50 Feet	100 Feet	Traffic Volume	Emission Factors <sup>2</sup>	25 Feet	50 Feet	100 Feet
<b>A.M. Peak Traffic Hour</b>								
North-South Road	5.7	4.6	3.4	4,820	1.23	0.34	0.27	0.20
East-West Road	2.2	1.9	1.6	1,180	1.23	0.03	0.03	0.02
<b>P.M. Peak Traffic Hour</b>								
North-South Road	5.7	4.6	3.4	4,930	1.09	0.31	0.25	0.18
East-West Road	2.2	1.9	1.6	1,060	1.09	0.03	0.02	0.02

<sup>1</sup> Methodology from Bay Area Air Quality Management District *BAAQMD CEQA Guidelines* (1996).

<sup>2</sup> Emission factors from EMFAC2002 (2003).

## Total Roadway CO Concentrations

Peak Hour Emissions = North-South Concentration + East-West Concentration + Background 1-hour Concentration<sup>2</sup>

8-Hour Emissions = ((Highest Peak Hour Concentration - Background 1-hour Concentration) x Persistence Factor) + Background 8-hour Concentration

	A.M. Peak Hour	P.M. Peak Hour	8-Hour
25 Feet from Roadway Edge	3.4	3.3	1.8
50 Feet from Roadway Edge	3.3	3.3	1.7
100 Feet from Roadway Edge	3.2	3.2	1.7

<sup>2</sup> Methodology from Bay Area Air Quality Management District *BAAQMD CEQA Guidelines* (1996).

# SIMPLIFIED CALINE4 CARBON MONOXIDE ANALYSIS

**Project Number:** 10953-00  
**Project Title:** City of Lake Forest Opportunities Study Program EIR

## Background Information

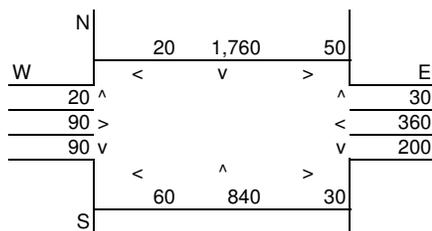
Nearest Air Monitoring Station measuring CO: Mission Viejo - 26081 Via Pera  
 Background 1-hour CO Concentration (ppm): 3.0  
 Background 8-hour CO Concentration (ppm): 1.5  
 Persistence Factor: 0.8  
 Analysis Year: 2030

## Roadway Data

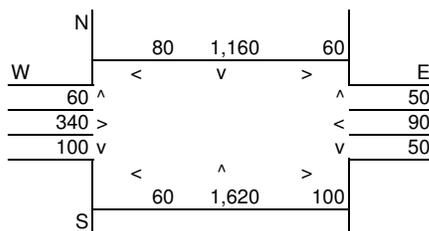
Intersection: Lake Forest & Toledo  
 Analysis Condition: Year 2030 Traffic Volumes - Proposed Project

	Roadway Type	No. of Lanes	Average Speed		
			A.M.	P.M.	
North-South Roadway:	Lake Forest	At Grade	8	20	20
East-West Roadway:	Toledo	At Grade	6	20	20

### A.M. Peak Hour Traffic Volumes



### P.M. Peak Hour Traffic Volumes



### Highest Traffic Volumes (Vehicles per Hour)

N-S Road:	2,980	N-S Road:	3,090
E-W Road:	760	E-W Road:	730

## Roadway CO Contributions and Concentrations

Emissions = (A x B x C) / 100,000<sup>1</sup>

Roadway	A <sub>1</sub>	A <sub>2</sub>	A <sub>3</sub>	B	C	Estimated CO Concentrations		
	Reference CO Concentrations 25 Feet	50 Feet	100 Feet	Traffic Volume	Emission Factors <sup>2</sup>	25 Feet	50 Feet	100 Feet
<b>A.M. Peak Traffic Hour</b>								
North-South Road	5.7	4.6	3.4	2,980	1.09	0.19	0.15	0.11
East-West Road	2.3	2.0	1.7	760	1.09	0.02	0.02	0.01
<b>P.M. Peak Traffic Hour</b>								
North-South Road	5.7	4.6	3.4	3,090	1.09	0.19	0.15	0.11
East-West Road	2.3	2.0	1.7	730	1.09	0.02	0.02	0.01

<sup>1</sup> Methodology from Bay Area Air Quality Management District *BAAQMD CEQA Guidelines* (1996).

<sup>2</sup> Emission factors from EMFAC2002 (2003).

## Total Roadway CO Concentrations

Peak Hour Emissions = North-South Concentration + East-West Concentration + Background 1-hour Concentration<sup>2</sup>

8-Hour Emissions = ((Highest Peak Hour Concentration - Background 1-hour Concentration) x Persistence Factor) + Background 8-hour Concentration

	A.M. Peak Hour	P.M. Peak Hour	8-Hour
25 Feet from Roadway Edge	3.2	3.2	1.7
50 Feet from Roadway Edge	3.2	3.2	1.6
100 Feet from Roadway Edge	3.1	3.1	1.6

<sup>2</sup> Methodology from Bay Area Air Quality Management District *BAAQMD CEQA Guidelines* (1996).

# SIMPLIFIED CALINE4 CARBON MONOXIDE ANALYSIS

**Project Number:** 10953-00  
**Project Title:** City of Lake Forest Opportunities Study Program EIR

## Background Information

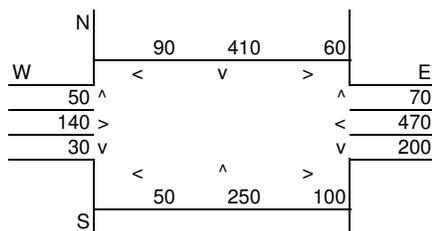
Nearest Air Monitoring Station measuring CO: Mission Viejo - 26081 Via Pera  
 Background 1-hour CO Concentration (ppm): 3.0  
 Background 8-hour CO Concentration (ppm): 1.5  
 Persistence Factor: 0.8  
 Analysis Year: 2030

## Roadway Data

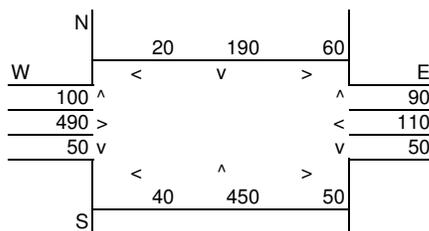
Intersection: Ridge Route & Toledo  
 Analysis Condition: Year 2030 Traffic Volumes - Proposed Project

	Roadway Type	No. of Lanes	Average Speed		
			A.M.	P.M.	
North-South Roadway:	Ridge Route	At Grade	6	20	20
East-West Roadway:	Toledo	At Grade	6	20	20

### A.M. Peak Hour Traffic Volumes



### P.M. Peak Hour Traffic Volumes



### Highest Traffic Volumes (Vehicles per Hour)

N-S Road:	1,040	N-S Road:	910
E-W Road:	1,040	E-W Road:	850

## Roadway CO Contributions and Concentrations

$$\text{Emissions} = (A \times B \times C) / 100,000^1$$

Roadway	A <sub>1</sub>	A <sub>2</sub>	A <sub>3</sub>	B	C	Estimated CO Concentrations		
	Reference CO Concentrations 25 Feet	50 Feet	100 Feet	Traffic Volume	Emission Factors <sup>2</sup>	25 Feet	50 Feet	100 Feet
<b>A.M. Peak Traffic Hour</b>								
North-South Road	6.1	4.9	3.5	1,040	1.09	0.07	0.06	0.04
East-West Road	2.3	2.0	1.7	1,040	1.09	0.03	0.02	0.02
<b>P.M. Peak Traffic Hour</b>								
North-South Road	6.1	4.9	3.5	910	1.09	0.06	0.05	0.03
East-West Road	2.3	2.0	1.7	850	1.09	0.02	0.02	0.02

<sup>1</sup> Methodology from Bay Area Air Quality Management District *BAAQMD CEQA Guidelines* (1996).

<sup>2</sup> Emission factors from EMFAC2002 (2003).

## Total Roadway CO Concentrations

$$\text{Peak Hour Emissions} = \text{North-South Concentration} + \text{East-West Concentration} + \text{Background 1-hour Concentration}^2$$

$$\text{8-Hour Emissions} = ((\text{Highest Peak Hour Concentration} - \text{Background 1-hour Concentration}) \times \text{Persistence Factor}) + \text{Background 8-hour Concentration}$$

	A.M. Peak Hour	P.M. Peak Hour	8-Hour
25 Feet from Roadway Edge	3.1	3.1	1.6
50 Feet from Roadway Edge	3.1	3.1	1.6
100 Feet from Roadway Edge	3.1	3.1	1.5

<sup>2</sup> Methodology from Bay Area Air Quality Management District *BAAQMD CEQA Guidelines* (1996).

# SIMPLIFIED CALINE4 CARBON MONOXIDE ANALYSIS

Project Number: 10953-00  
 Project Title: City of Lake Forest Opportunities Study Program EIR

## Background Information

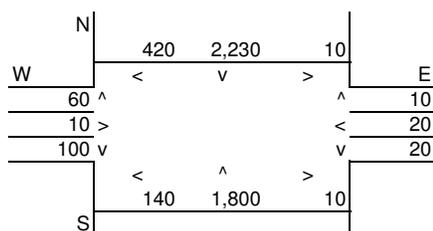
Nearest Air Monitoring Station measuring CO: Mission Viejo - 26081 Via Pera  
 Background 1-hour CO Concentration (ppm): 3.0  
 Background 8-hour CO Concentration (ppm): 1.5  
 Persistence Factor: 0.8  
 Analysis Year: 2030

## Roadway Data

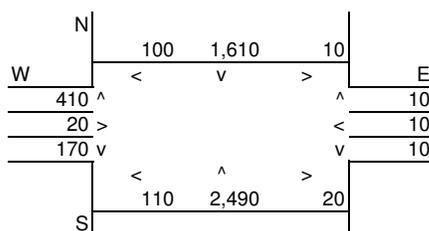
Intersection: El Toro & Toledo  
 Analysis Condition: Year 2030 Traffic Volumes - Proposed Project

	Roadway Type	No. of Lanes	Average Speed		
			A.M.	P.M.	
North-South Roadway:	El Toro	At Grade	8	20	20
East-West Roadway:	Toledo	At Grade	4	20	20

### A.M. Peak Hour Traffic Volumes



### P.M. Peak Hour Traffic Volumes



### Highest Traffic Volumes (Vehicles per Hour)

N-S Road:	4,530	N-S Road:	4,630
E-W Road:	750	E-W Road:	820

## Roadway CO Contributions and Concentrations

$$\text{Emissions} = (A \times B \times C) / 100,000^1$$

Roadway	A <sub>1</sub>	A <sub>2</sub>	A <sub>3</sub>	B	C	Estimated CO Concentrations		
	Reference CO Concentrations 25 Feet	50 Feet	100 Feet	Traffic Volume	Emission Factors <sup>2</sup>	25 Feet	50 Feet	100 Feet
<b>A.M. Peak Traffic Hour</b>								
North-South Road	5.7	4.6	3.4	4,530	1.09	0.28	0.23	0.17
East-West Road	2.6	2.2	1.7	750	1.09	0.02	0.02	0.01
<b>P.M. Peak Traffic Hour</b>								
North-South Road	5.7	4.6	3.4	4,630	1.09	0.29	0.23	0.17
East-West Road	2.6	2.2	1.7	820	1.09	0.02	0.02	0.02

<sup>1</sup> Methodology from Bay Area Air Quality Management District *BAAQMD CEQA Guidelines* (1996).

<sup>2</sup> Emission factors from EMFAC2002 (2003).

## Total Roadway CO Concentrations

$$\text{Peak Hour Emissions} = \text{North-South Concentration} + \text{East-West Concentration} + \text{Background 1-hour Concentration}^2$$

$$\text{8-Hour Emissions} = ((\text{Highest Peak Hour Concentration} - \text{Background 1-hour Concentration}) \times \text{Persistence Factor}) + \text{Background 8-hour Concentration}$$

	A.M. Peak Hour	P.M. Peak Hour	8-Hour
25 Feet from Roadway Edge	3.3	3.3	1.7
50 Feet from Roadway Edge	3.2	3.3	1.7
100 Feet from Roadway Edge	3.2	3.2	1.6

<sup>2</sup> Methodology from Bay Area Air Quality Management District *BAAQMD CEQA Guidelines* (1996).

# SIMPLIFIED CALINE4 CARBON MONOXIDE ANALYSIS

Project Number: 10953-00  
 Project Title: City of Lake Forest Opportunities Study Program EIR

## Background Information

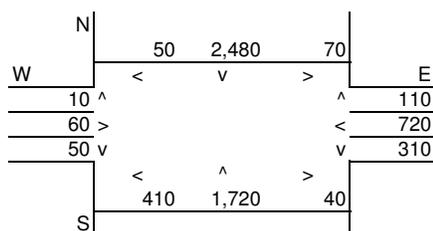
Nearest Air Monitoring Station measuring CO: Mission Viejo - 26081 Via Pera  
 Background 1-hour CO Concentration (ppm): 3.0  
 Background 8-hour CO Concentration (ppm): 1.5  
 Persistence Factor: 0.8  
 Analysis Year: 2030

## Roadway Data

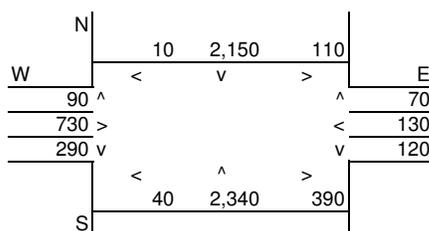
Intersection: Bake & Jeronimo  
 Analysis Condition: Year 2030 Traffic Volumes - Proposed Project

	Roadway Type	No. of Lanes	Average Speed		
			A.M.	P.M.	
North-South Roadway:	Bake	At Grade	8	5	15
East-West Roadway:	Jeronimo	At Grade	8	5	15

### A.M. Peak Hour Traffic Volumes



### P.M. Peak Hour Traffic Volumes



### Highest Traffic Volumes (Vehicles per Hour)

N-S Road: 5,010	N-S Road: 5,330
E-W Road: 1,310	E-W Road: 1,550

## Roadway CO Contributions and Concentrations

$$\text{Emissions} = (A \times B \times C) / 100,000^1$$

Roadway	A <sub>1</sub>	A <sub>2</sub>	A <sub>3</sub>	B	C	Estimated CO Concentrations		
	Reference CO Concentrations 25 Feet	50 Feet	100 Feet	Traffic Volume	Emission Factors <sup>2</sup>	25 Feet	50 Feet	100 Feet
<b>A.M. Peak Traffic Hour</b>								
North-South Road	5.7	4.6	3.4	5,010	1.65	0.47	0.38	0.28
East-West Road	2.2	1.9	1.6	1,310	1.65	0.05	0.04	0.03
<b>P.M. Peak Traffic Hour</b>								
North-South Road	5.7	4.6	3.4	5,330	1.23	0.37	0.30	0.22
East-West Road	2.2	1.9	1.6	1,550	1.23	0.04	0.04	0.03

<sup>1</sup> Methodology from Bay Area Air Quality Management District *BAAQMD CEQA Guidelines* (1996).

<sup>2</sup> Emission factors from EMFAC2002 (2003).

## Total Roadway CO Concentrations

$$\text{Peak Hour Emissions} = \text{North-South Concentration} + \text{East-West Concentration} + \text{Background 1-hour Concentration}^2$$

$$\text{8-Hour Emissions} = ((\text{Highest Peak Hour Concentration} - \text{Background 1-hour Concentration}) \times \text{Persistence Factor}) + \text{Background 8-hour Concentration}$$

	A.M. Peak Hour	P.M. Peak Hour	8-Hour
25 Feet from Roadway Edge	3.5	3.4	1.9
50 Feet from Roadway Edge	3.4	3.3	1.8
100 Feet from Roadway Edge	3.3	3.3	1.8

<sup>2</sup> Methodology from Bay Area Air Quality Management District *BAAQMD CEQA Guidelines* (1996).

# SIMPLIFIED CALINE4 CARBON MONOXIDE ANALYSIS

**Project Number:** 10953-00  
**Project Title:** City of Lake Forest Opportunities Study Program EIR

## Background Information

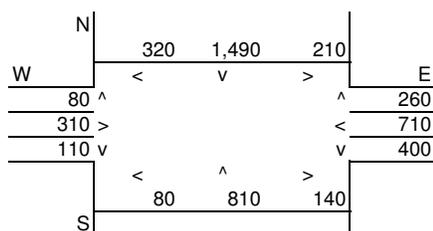
Nearest Air Monitoring Station measuring CO: Mission Viejo - 26081 Via Pera  
 Background 1-hour CO Concentration (ppm): 3.0  
 Background 8-hour CO Concentration (ppm): 1.5  
 Persistence Factor: 0.8  
 Analysis Year: 2030

## Roadway Data

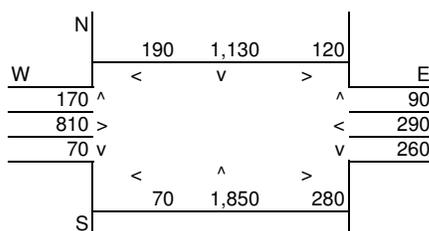
Intersection: Lake Forest & Jeronimo  
 Analysis Condition: Year 2030 Traffic Volumes - Proposed Project

	Roadway Type	No. of Lanes	Average Speed		
			A.M.	P.M.	
North-South Roadway:	Lake Forest	At Grade	8	20	15
East-West Roadway:	Jeronimo	At Grade	6	20	15

### A.M. Peak Hour Traffic Volumes



### P.M. Peak Hour Traffic Volumes



### Highest Traffic Volumes (Vehicles per Hour)

N-S Road: 3,170                      N-S Road: 3,660  
 E-W Road: 2,030                    E-W Road: 1,850

## Roadway CO Contributions and Concentrations

$$\text{Emissions} = (A \times B \times C) / 100,000^1$$

Roadway	A <sub>1</sub>	A <sub>2</sub>	A <sub>3</sub>	B	C	Estimated CO Concentrations		
	Reference CO Concentrations 25 Feet	50 Feet	100 Feet	Traffic Volume	Emission Factors <sup>2</sup>	25 Feet	50 Feet	100 Feet
<b>A.M. Peak Traffic Hour</b>								
North-South Road	5.7	4.6	3.4	3,170	1.09	0.20	0.16	0.12
East-West Road	2.3	2.0	1.7	2,030	1.09	0.05	0.04	0.04
<b>P.M. Peak Traffic Hour</b>								
North-South Road	5.7	4.6	3.4	3,660	1.23	0.26	0.21	0.15
East-West Road	2.3	2.0	1.7	1,850	1.23	0.05	0.05	0.04

<sup>1</sup> Methodology from Bay Area Air Quality Management District *BAAQMD CEQA Guidelines* (1996).

<sup>2</sup> Emission factors from EMFAC2002 (2003).

## Total Roadway CO Concentrations

$$\text{Peak Hour Emissions} = \text{North-South Concentration} + \text{East-West Concentration} + \text{Background 1-hour Concentration}^2$$

$$\text{8-Hour Emissions} = ((\text{Highest Peak Hour Concentration} - \text{Background 1-hour Concentration}) \times \text{Persistence Factor}) + \text{Background 8-hour Concentration}$$

	A.M. Peak Hour	P.M. Peak Hour	8-Hour
25 Feet from Roadway Edge	3.2	3.3	1.7
50 Feet from Roadway Edge	3.2	3.3	1.7
100 Feet from Roadway Edge	3.2	3.2	1.7

<sup>2</sup> Methodology from Bay Area Air Quality Management District *BAAQMD CEQA Guidelines* (1996).



# SIMPLIFIED CALINE4 CARBON MONOXIDE ANALYSIS

**Project Number:** 10953-00  
**Project Title:** City of Lake Forest Opportunities Study Program EIR

## Background Information

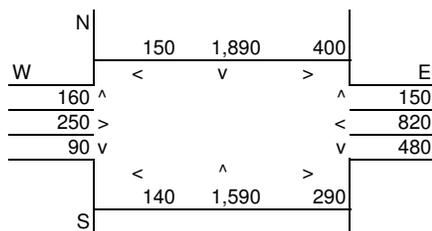
Nearest Air Monitoring Station measuring CO: Mission Viejo - 26081 Via Pera  
 Background 1-hour CO Concentration (ppm): 3.0  
 Background 8-hour CO Concentration (ppm): 1.5  
 Persistence Factor: 0.8  
 Analysis Year: 2030

## Roadway Data

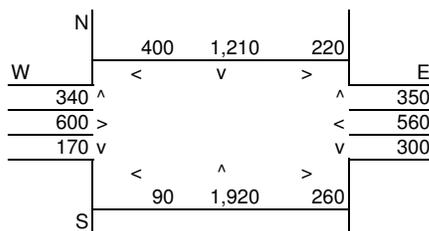
Intersection: El Toro & Jeronimo  
 Analysis Condition: Year 2030 Traffic Volumes - Proposed Project

	Roadway Type	No. of Lanes	Average Speed		
			A.M.	P.M.	
North-South Roadway:	El Toro	At Grade	8	10	10
East-West Roadway:	Jeronimo	At Grade	8	10	10

### A.M. Peak Hour Traffic Volumes



### P.M. Peak Hour Traffic Volumes



### Highest Traffic Volumes (Vehicles per Hour)

N-S Road: 4,480                      N-S Road: 4,440  
 E-W Road: 2,390                      E-W Road: 2,290

## Roadway CO Contributions and Concentrations

Emissions = (A x B x C) / 100,000<sup>1</sup>

Roadway	A <sub>1</sub>	A <sub>2</sub>	A <sub>3</sub>	B	C	Estimated CO Concentrations		
	Reference CO Concentrations 25 Feet	50 Feet	100 Feet	Traffic Volume	Emission Factors <sup>2</sup>	25 Feet	50 Feet	100 Feet
<b>A.M. Peak Traffic Hour</b>								
North-South Road	5.7	4.6	3.4	4,480	1.41	0.36	0.29	0.21
East-West Road	2.2	1.9	1.6	2,390	1.41	0.07	0.06	0.05
<b>P.M. Peak Traffic Hour</b>								
North-South Road	5.7	4.6	3.4	4,440	1.41	0.36	0.29	0.21
East-West Road	2.2	1.9	1.6	2,290	1.41	0.07	0.06	0.05

<sup>1</sup> Methodology from Bay Area Air Quality Management District *BAAQMD CEQA Guidelines* (1996).

<sup>2</sup> Emission factors from EMFAC2002 (2003).

## Total Roadway CO Concentrations

Peak Hour Emissions = North-South Concentration + East-West Concentration + Background 1-hour Concentration<sup>2</sup>

8-Hour Emissions = ((Highest Peak Hour Concentration - Background 1-hour Concentration) x Persistence Factor) + Background 8-hour Concentration

	A.M. Peak Hour	P.M. Peak Hour	8-Hour
25 Feet from Roadway Edge	3.4	3.4	1.8
50 Feet from Roadway Edge	3.4	3.3	1.8
100 Feet from Roadway Edge	3.3	3.3	1.7

<sup>2</sup> Methodology from Bay Area Air Quality Management District *BAAQMD CEQA Guidelines* (1996).

# SIMPLIFIED CALINE4 CARBON MONOXIDE ANALYSIS

**Project Number:** 10953-00  
**Project Title:** City of Lake Forest Opportunities Study Program EIR

## Background Information

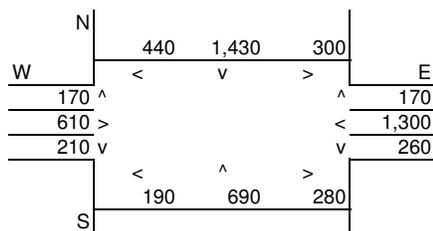
Nearest Air Monitoring Station measuring CO: Mission Viejo - 26081 Via Pera  
 Background 1-hour CO Concentration (ppm): 3.0  
 Background 8-hour CO Concentration (ppm): 1.5  
 Persistence Factor: 0.8  
 Analysis Year: 2030

## Roadway Data

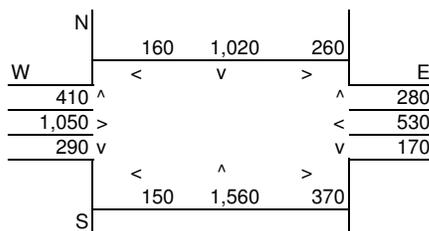
Intersection: Los Alisos & Jeronimo  
 Analysis Condition: Year 2030 Traffic Volumes - Proposed Project

	Roadway Type	No. of Lanes	Average Speed		
			A.M.	P.M.	
North-South Roadway:	Los Alisos	At Grade	8	10	10
East-West Roadway:	Jeronimo	At Grade	8	10	10

### A.M. Peak Hour Traffic Volumes



### P.M. Peak Hour Traffic Volumes



### Highest Traffic Volumes (Vehicles per Hour)

N-S Road:	3,200	N-S Road:	3,690
E-W Road:	2,920	E-W Road:	2,660

## Roadway CO Contributions and Concentrations

$$\text{Emissions} = (A \times B \times C) / 100,000^1$$

Roadway	A <sub>1</sub>	A <sub>2</sub>	A <sub>3</sub>	B	C	Estimated CO Concentrations		
	Reference CO Concentrations 25 Feet	50 Feet	100 Feet	Traffic Volume	Emission Factors <sup>2</sup>	25 Feet	50 Feet	100 Feet
<b>A.M. Peak Traffic Hour</b>								
North-South Road	5.7	4.6	3.4	3,200	1.41	0.26	0.21	0.15
East-West Road	2.2	1.9	1.6	2,920	1.41	0.09	0.08	0.07
<b>P.M. Peak Traffic Hour</b>								
North-South Road	5.7	4.6	3.4	3,690	1.41	0.30	0.24	0.18
East-West Road	2.2	1.9	1.6	2,660	1.41	0.08	0.07	0.06

<sup>1</sup> Methodology from Bay Area Air Quality Management District *BAAQMD CEQA Guidelines* (1996).

<sup>2</sup> Emission factors from EMFAC2002 (2003).

## Total Roadway CO Concentrations

$$\text{Peak Hour Emissions} = \text{North-South Concentration} + \text{East-West Concentration} + \text{Background 1-hour Concentration}^2$$

$$\text{8-Hour Emissions} = ((\text{Highest Peak Hour Concentration} - \text{Background 1-hour Concentration}) \times \text{Persistence Factor}) + \text{Background 8-hour Concentration}$$

	A.M. Peak Hour	P.M. Peak Hour	8-Hour
25 Feet from Roadway Edge	3.3	3.4	1.8
50 Feet from Roadway Edge	3.3	3.3	1.7
100 Feet from Roadway Edge	3.2	3.2	1.7

<sup>2</sup> Methodology from Bay Area Air Quality Management District *BAAQMD CEQA Guidelines* (1996).

# SIMPLIFIED CALINE4 CARBON MONOXIDE ANALYSIS

Project Number: 10953-00  
 Project Title: City of Lake Forest Opportunities Study Program EIR

## Background Information

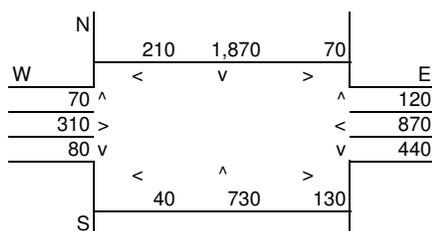
Nearest Air Monitoring Station measuring CO: Mission Viejo - 26081 Via Pera  
 Background 1-hour CO Concentration (ppm): 3.0  
 Background 8-hour CO Concentration (ppm): 1.5  
 Persistence Factor: 0.8  
 Analysis Year: 2030

## Roadway Data

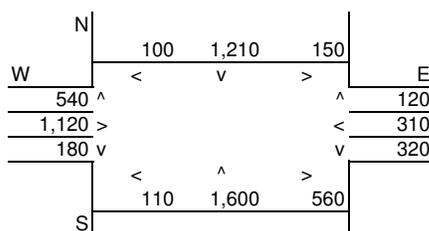
Intersection: Lake Forest & Muirlands  
 Analysis Condition: Year 2030 Traffic Volumes - Proposed Project

	Roadway Type	No. of Lanes	Average Speed		
			A.M.	P.M.	
North-South Roadway:	Lake Forest	At Grade	8	20	15
East-West Roadway:	Muirlands	At Grade	8	20	15

### A.M. Peak Hour Traffic Volumes



### P.M. Peak Hour Traffic Volumes



### Highest Traffic Volumes (Vehicles per Hour)

N-S Road: 3,290                      N-S Road: 3,980  
 E-W Road: 1,940                      E-W Road: 2,580

## Roadway CO Contributions and Concentrations

Emissions = (A x B x C) / 100,000<sup>1</sup>

Roadway	A <sub>1</sub>	A <sub>2</sub>	A <sub>3</sub>	B	C	Estimated CO Concentrations		
	Reference CO Concentrations 25 Feet	50 Feet	100 Feet	Traffic Volume	Emission Factors <sup>2</sup>	25 Feet	50 Feet	100 Feet
A.M. Peak Traffic Hour								
North-South Road	5.7	4.6	3.4	3,290	1.09	0.20	0.16	0.12
East-West Road	2.2	1.9	1.6	1,940	1.09	0.05	0.04	0.03
P.M. Peak Traffic Hour								
North-South Road	5.7	4.6	3.4	3,980	1.23	0.28	0.23	0.17
East-West Road	2.2	1.9	1.6	2,580	1.23	0.07	0.06	0.05

<sup>1</sup> Methodology from Bay Area Air Quality Management District *BAAQMD CEQA Guidelines* (1996).

<sup>2</sup> Emission factors from EMFAC2002 (2003).

## Total Roadway CO Concentrations

Peak Hour Emissions = North-South Concentration + East-West Concentration + Background 1-hour Concentration<sup>2</sup>

8-Hour Emissions = ((Highest Peak Hour Concentration - Background 1-hour Concentration) x Persistence Factor) + Background 8-hour Concentration

	A.M. Peak Hour	P.M. Peak Hour	8-Hour
25 Feet from Roadway Edge	3.3	3.3	1.8
50 Feet from Roadway Edge	3.2	3.3	1.7
100 Feet from Roadway Edge	3.2	3.2	1.7

<sup>2</sup> Methodology from Bay Area Air Quality Management District *BAAQMD CEQA Guidelines* (1996).

# SIMPLIFIED CALINE4 CARBON MONOXIDE ANALYSIS

Project Number: 10953-00  
 Project Title: City of Lake Forest Opportunities Study Program EIR

## Background Information

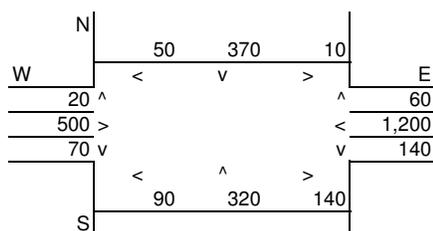
Nearest Air Monitoring Station measuring CO: Mission Viejo - 26081 Via Pera  
 Background 1-hour CO Concentration (ppm): 3.0  
 Background 8-hour CO Concentration (ppm): 1.5  
 Persistence Factor: 0.8  
 Analysis Year: 2030

## Roadway Data

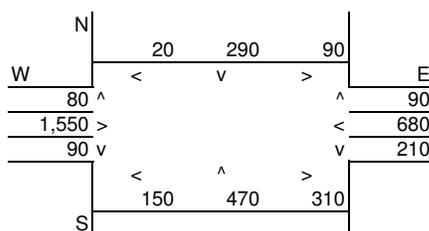
Intersection: Ridge Route & Muirlands  
 Analysis Condition: Year 2030 Traffic Volumes - Proposed Project

	Roadway Type	No. of Lanes	Average Speed		
			A.M.	P.M.	
North-South Roadway:	Ridge Route	At Grade	8	20	15
East-West Roadway:	Muirlands	At Grade	8	20	15

### A.M. Peak Hour Traffic Volumes



### P.M. Peak Hour Traffic Volumes



### Highest Traffic Volumes (Vehicles per Hour)

N-S Road: 1,130                      N-S Road: 1,520  
 E-W Road: 2,050                      E-W Road: 2,930

## Roadway CO Contributions and Concentrations

$$\text{Emissions} = (A \times B \times C) / 100,000^1$$

Roadway	A <sub>1</sub>	A <sub>2</sub>	A <sub>3</sub>	B	C	Estimated CO Concentrations		
	Reference CO Concentrations 25 Feet	50 Feet	100 Feet	Traffic Volume	Emission Factors <sup>2</sup>	25 Feet	50 Feet	100 Feet
A.M. Peak Traffic Hour								
North-South Road	2.2	1.9	1.6	1,130	1.09	0.03	0.02	0.02
East-West Road	5.7	4.6	3.4	2,050	1.09	0.13	0.10	0.08
P.M. Peak Traffic Hour								
North-South Road	2.2	1.9	1.6	1,520	1.23	0.04	0.04	0.03
East-West Road	5.7	4.6	3.4	2,930	1.23	0.21	0.17	0.12

<sup>1</sup> Methodology from Bay Area Air Quality Management District *BAAQMD CEQA Guidelines* (1996).

<sup>2</sup> Emission factors from EMFAC2002 (2003).

## Total Roadway CO Concentrations

$$\text{Peak Hour Emissions} = \text{North-South Concentration} + \text{East-West Concentration} + \text{Background 1-hour Concentration}^2$$

$$\text{8-Hour Emissions} = ((\text{Highest Peak Hour Concentration} - \text{Background 1-hour Concentration}) \times \text{Persistence Factor}) + \text{Background 8-hour Concentration}$$

	A.M. Peak Hour	P.M. Peak Hour	8-Hour
25 Feet from Roadway Edge	3.2	3.2	1.7
50 Feet from Roadway Edge	3.1	3.2	1.7
100 Feet from Roadway Edge	3.1	3.2	1.6

<sup>2</sup> Methodology from Bay Area Air Quality Management District *BAAQMD CEQA Guidelines* (1996).

# SIMPLIFIED CALINE4 CARBON MONOXIDE ANALYSIS

Project Number: 10953-00  
 Project Title: City of Lake Forest Opportunities Study Program EIR

## Background Information

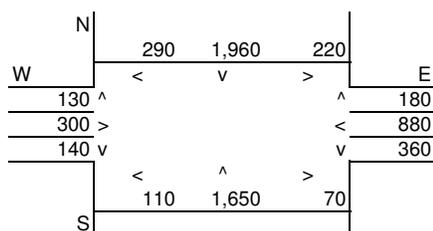
Nearest Air Monitoring Station measuring CO: Mission Viejo - 26081 Via Pera  
 Background 1-hour CO Concentration (ppm): 3.0  
 Background 8-hour CO Concentration (ppm): 1.5  
 Persistence Factor: 0.8  
 Analysis Year: 2030

## Roadway Data

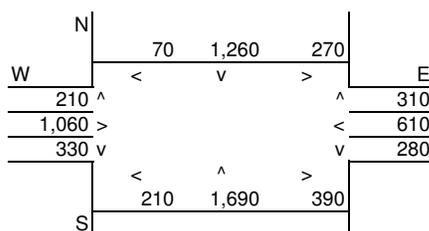
Intersection: El Toro & Muirlands  
 Analysis Condition: Year 2030 Traffic Volumes - Proposed Project

	Roadway Type	No. of Lanes	Average Speed		
			A.M.	P.M.	
North-South Roadway:	El Toro	At Grade	8	20	15
East-West Roadway:	Muirlands	At Grade	8	20	15

### A.M. Peak Hour Traffic Volumes



### P.M. Peak Hour Traffic Volumes



### Highest Traffic Volumes (Vehicles per Hour)

N-S Road: 4,430	N-S Road: 4,160
E-W Road: 2,010	E-W Road: 2,920

## Roadway CO Contributions and Concentrations

$$\text{Emissions} = (A \times B \times C) / 100,000^1$$

Roadway	A <sub>1</sub>	A <sub>2</sub>	A <sub>3</sub>	B	C	Estimated CO Concentrations		
	Reference CO Concentrations 25 Feet	50 Feet	100 Feet	Traffic Volume	Emission Factors <sup>2</sup>	25 Feet	50 Feet	100 Feet
<b>A.M. Peak Traffic Hour</b>								
North-South Road	5.7	4.6	3.4	4,430	1.09	0.28	0.22	0.16
East-West Road	2.2	1.9	1.6	2,010	1.09	0.05	0.04	0.04
<b>P.M. Peak Traffic Hour</b>								
North-South Road	5.7	4.6	3.4	4,160	1.23	0.29	0.24	0.17
East-West Road	2.2	1.9	1.6	2,920	1.23	0.08	0.07	0.06

<sup>1</sup> Methodology from Bay Area Air Quality Management District *BAAQMD CEQA Guidelines* (1996).

<sup>2</sup> Emission factors from EMFAC2002 (2003).

## Total Roadway CO Concentrations

$$\text{Peak Hour Emissions} = \text{North-South Concentration} + \text{East-West Concentration} + \text{Background 1-hour Concentration}^2$$

$$\text{8-Hour Emissions} = ((\text{Highest Peak Hour Concentration} - \text{Background 1-hour Concentration}) \times \text{Persistence Factor}) + \text{Background 8-hour Concentration}$$

	A.M. Peak Hour	P.M. Peak Hour	8-Hour
25 Feet from Roadway Edge	3.3	3.4	1.8
50 Feet from Roadway Edge	3.3	3.3	1.7
100 Feet from Roadway Edge	3.2	3.2	1.7

<sup>2</sup> Methodology from Bay Area Air Quality Management District *BAAQMD CEQA Guidelines* (1996).

# SIMPLIFIED CALINE4 CARBON MONOXIDE ANALYSIS

**Project Number:** 10953-00  
**Project Title:** City of Lake Forest Opportunities Study Program EIR

## Background Information

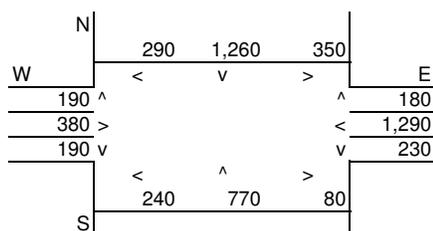
Nearest Air Monitoring Station measuring CO: Mission Viejo - 26081 Via Pera  
 Background 1-hour CO Concentration (ppm): 3.0  
 Background 8-hour CO Concentration (ppm): 1.5  
 Persistence Factor: 0.8  
 Analysis Year: 2030

## Roadway Data

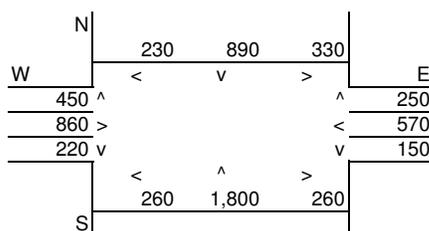
Intersection: Los Alisos & Muirlands  
 Analysis Condition: Year 2030 Traffic Volumes - Proposed Project

	Roadway Type	No. of Lanes	Average Speed		
			A.M.	P.M.	
North-South Roadway:	Los Alisos	At Grade	8	10	5
East-West Roadway:	Muirlands	At Grade	6	10	5

### A.M. Peak Hour Traffic Volumes



### P.M. Peak Hour Traffic Volumes



### Highest Traffic Volumes (Vehicles per Hour)

N-S Road:	3,040	N-S Road:	3,950
E-W Road:	2,580	E-W Road:	2,590

## Roadway CO Contributions and Concentrations

$$\text{Emissions} = (A \times B \times C) / 100,000^1$$

Roadway	A <sub>1</sub>	A <sub>2</sub>	A <sub>3</sub>	B	C	Estimated CO Concentrations		
	Reference CO Concentrations 25 Feet	50 Feet	100 Feet	Traffic Volume	Emission Factors <sup>2</sup>	25 Feet	50 Feet	100 Feet
<b>A.M. Peak Traffic Hour</b>								
North-South Road	5.7	4.6	3.4	3,040	1.41	0.24	0.20	0.15
East-West Road	2.3	2.0	1.7	2,580	1.41	0.08	0.07	0.06
<b>P.M. Peak Traffic Hour</b>								
North-South Road	5.7	4.6	3.4	3,950	1.65	0.37	0.30	0.22
East-West Road	2.3	2.0	1.7	2,590	1.65	0.10	0.09	0.07

<sup>1</sup> Methodology from Bay Area Air Quality Management District *BAAQMD CEQA Guidelines* (1996).

<sup>2</sup> Emission factors from EMFAC2002 (2003).

## Total Roadway CO Concentrations

$$\text{Peak Hour Emissions} = \text{North-South Concentration} + \text{East-West Concentration} + \text{Background 1-hour Concentration}^2$$

$$\text{8-Hour Emissions} = ((\text{Highest Peak Hour Concentration} - \text{Background 1-hour Concentration}) \times \text{Persistence Factor}) + \text{Background 8-hour Concentration}$$

	A.M. Peak Hour	P.M. Peak Hour	8-Hour
25 Feet from Roadway Edge	3.3	3.5	1.9
50 Feet from Roadway Edge	3.3	3.4	1.8
100 Feet from Roadway Edge	3.2	3.3	1.7

<sup>2</sup> Methodology from Bay Area Air Quality Management District *BAAQMD CEQA Guidelines* (1996).

# SIMPLIFIED CALINE4 CARBON MONOXIDE ANALYSIS

Project Number: 10953-00  
 Project Title: City of Lake Forest Opportunities Study Program EIR

## Background Information

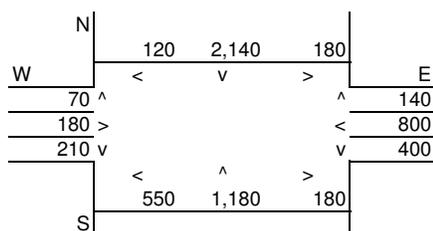
Nearest Air Monitoring Station measuring CO: Mission Viejo - 26081 Via Pera  
 Background 1-hour CO Concentration (ppm): 3.0  
 Background 8-hour CO Concentration (ppm): 1.5  
 Persistence Factor: 0.8  
 Analysis Year: 2030

## Roadway Data

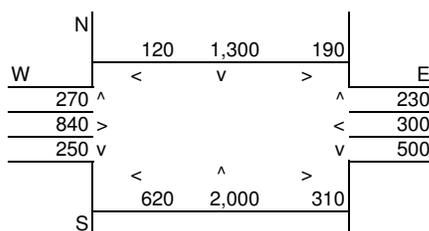
Intersection: Lake Forest & Rockfield  
 Analysis Condition: Year 2030 Traffic Volumes - Proposed Project

	Roadway Type	No. of Lanes	Average Speed		
			A.M.	P.M.	
North-South Roadway:	Lake Forest	At Grade	8	20	15
East-West Roadway:	Rockfield	At Grade	8	20	15

### A.M. Peak Hour Traffic Volumes



### P.M. Peak Hour Traffic Volumes



### Highest Traffic Volumes (Vehicles per Hour)

N-S Road: 4,660	N-S Road: 4,980
E-W Road: 1,930	E-W Road: 2,400

## Roadway CO Contributions and Concentrations

$$\text{Emissions} = (A \times B \times C) / 100,000^1$$

Roadway	Reference CO Concentrations			B Traffic Volume	C Emission Factors <sup>2</sup>	Estimated CO Concentrations		
	A <sub>1</sub> 25 Feet	A <sub>2</sub> 50 Feet	A <sub>3</sub> 100 Feet			25 Feet	50 Feet	100 Feet
A.M. Peak Traffic Hour								
North-South Road	5.7	4.6	3.4	4,660	1.09	0.29	0.23	0.17
East-West Road	2.2	1.9	1.6	1,930	1.09	0.05	0.04	0.03
P.M. Peak Traffic Hour								
North-South Road	5.7	4.6	3.4	4,980	1.23	0.35	0.28	0.21
East-West Road	2.2	1.9	1.6	2,400	1.23	0.06	0.06	0.05

<sup>1</sup> Methodology from Bay Area Air Quality Management District *BAAQMD CEQA Guidelines* (1996).

<sup>2</sup> Emission factors from EMFAC2002 (2003).

## Total Roadway CO Concentrations

$$\text{Peak Hour Emissions} = \text{North-South Concentration} + \text{East-West Concentration} + \text{Background 1-hour Concentration}^2$$

$$\text{8-Hour Emissions} = ((\text{Highest Peak Hour Concentration} - \text{Background 1-hour Concentration}) \times \text{Persistence Factor}) + \text{Background 8-hour Concentration}$$

	A.M. Peak Hour	P.M. Peak Hour	8-Hour
25 Feet from Roadway Edge	3.3	3.4	1.8
50 Feet from Roadway Edge	3.3	3.3	1.8
100 Feet from Roadway Edge	3.2	3.3	1.7

<sup>2</sup> Methodology from Bay Area Air Quality Management District *BAAQMD CEQA Guidelines* (1996).

# SIMPLIFIED CALINE4 CARBON MONOXIDE ANALYSIS

Project Number: 10953-00  
 Project Title: City of Lake Forest Opportunities Study Program EIR

## Background Information

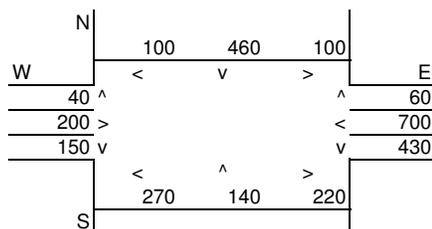
Nearest Air Monitoring Station measuring CO: Mission Viejo - 26081 Via Pera  
 Background 1-hour CO Concentration (ppm): 3.0  
 Background 8-hour CO Concentration (ppm): 1.5  
 Persistence Factor: 0.8  
 Analysis Year: 2030

## Roadway Data

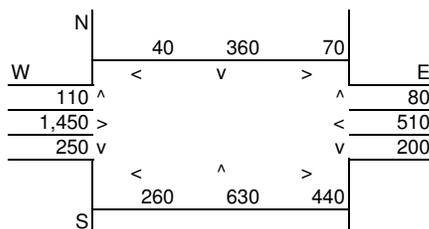
Intersection: Ridge Route & Rockfield  
 Analysis Condition: Year 2030 Traffic Volumes - Proposed Project

	Roadway Type	No. of Lanes	Average Speed		
			A.M.	P.M.	
North-South Roadway:	Ridge Route	At Grade	4	20	5
East-West Roadway:	Rockfield	At Grade	6	20	5

### A.M. Peak Hour Traffic Volumes



### P.M. Peak Hour Traffic Volumes



### Highest Traffic Volumes (Vehicles per Hour)

N-S Road: 1,670                      N-S Road: 2,140  
 E-W Road: 1,710                      E-W Road: 2,750

## Roadway CO Contributions and Concentrations

Emissions = (A x B x C) / 100,000<sup>1</sup>

Roadway	A <sub>1</sub>	A <sub>2</sub>	A <sub>3</sub>	B	C	Estimated CO Concentrations		
	Reference CO Concentrations 25 Feet	50 Feet	100 Feet	Traffic Volume	Emission Factors <sup>2</sup>	25 Feet	50 Feet	100 Feet
A.M. Peak Traffic Hour								
North-South Road	2.6	2.2	1.7	1,670	1.09	0.05	0.04	0.03
East-West Road	6.1	4.9	3.5	1,710	1.09	0.11	0.09	0.07
P.M. Peak Traffic Hour								
North-South Road	2.6	2.2	1.7	2,140	1.65	0.09	0.08	0.06
East-West Road	6.1	4.9	3.5	2,750	1.65	0.28	0.22	0.16

<sup>1</sup> Methodology from Bay Area Air Quality Management District *BAAQMD CEQA Guidelines* (1996).

<sup>2</sup> Emission factors from EMFAC2002 (2003).

## Total Roadway CO Concentrations

Peak Hour Emissions = North-South Concentration + East-West Concentration + Background 1-hour Concentration<sup>2</sup>

8-Hour Emissions = ((Highest Peak Hour Concentration - Background 1-hour Concentration) x Persistence Factor) + Background 8-hour Concentration

	A.M. Peak Hour	P.M. Peak Hour	8-Hour
25 Feet from Roadway Edge	3.2	3.4	1.8
50 Feet from Roadway Edge	3.1	3.3	1.7
100 Feet from Roadway Edge	3.1	3.2	1.7

<sup>2</sup> Methodology from Bay Area Air Quality Management District *BAAQMD CEQA Guidelines* (1996).



# SIMPLIFIED CALINE4 CARBON MONOXIDE ANALYSIS

**Project Number:** 10953-00  
**Project Title:** City of Lake Forest Opportunities Study Program EIR

## Background Information

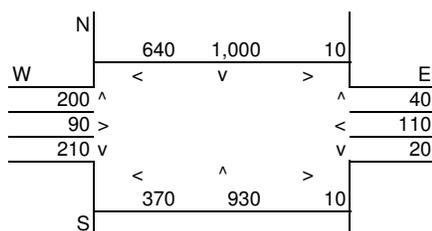
Nearest Air Monitoring Station measuring CO: Mission Viejo - 26081 Via Pera  
 Background 1-hour CO Concentration (ppm): 3.0  
 Background 8-hour CO Concentration (ppm): 1.5  
 Persistence Factor: 0.8  
 Analysis Year: 2030

## Roadway Data

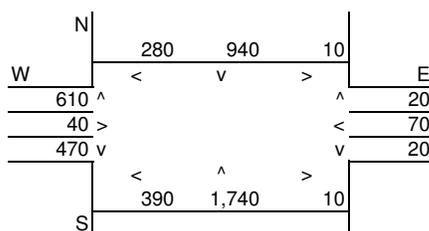
Intersection: Los Alisos & Rockfield  
 Analysis Condition: Year 2030 Traffic Volumes - Proposed Project

	Roadway Type	No. of Lanes	Average Speed		
			A.M.	P.M.	
North-South Roadway:	Los Alisos	At Grade	6	10	15
East-West Roadway:	Rockfield	At Grade	6	10	15

### A.M. Peak Hour Traffic Volumes



### P.M. Peak Hour Traffic Volumes



### Highest Traffic Volumes (Vehicles per Hour)

N-S Road:	2,820	N-S Road:	3,600
E-W Road:	1,620	E-W Road:	1,860

## Roadway CO Contributions and Concentrations

$$\text{Emissions} = (A \times B \times C) / 100,000^1$$

Roadway	A <sub>1</sub>	A <sub>2</sub>	A <sub>3</sub>	B	C	Estimated CO Concentrations		
	Reference CO Concentrations 25 Feet	50 Feet	100 Feet	Traffic Volume	Emission Factors <sup>2</sup>	25 Feet	50 Feet	100 Feet
<b>A.M. Peak Traffic Hour</b>								
North-South Road	6.1	4.9	3.5	2,820	1.41	0.24	0.19	0.14
East-West Road	2.3	2.0	1.7	1,620	1.41	0.05	0.05	0.04
<b>P.M. Peak Traffic Hour</b>								
North-South Road	6.1	4.9	3.5	3,600	1.23	0.27	0.22	0.15
East-West Road	2.3	2.0	1.7	1,860	1.23	0.05	0.05	0.04

<sup>1</sup> Methodology from Bay Area Air Quality Management District *BAAQMD CEQA Guidelines* (1996).

<sup>2</sup> Emission factors from EMFAC2002 (2003).

## Total Roadway CO Concentrations

$$\text{Peak Hour Emissions} = \text{North-South Concentration} + \text{East-West Concentration} + \text{Background 1-hour Concentration}^2$$

$$\text{8-Hour Emissions} = ((\text{Highest Peak Hour Concentration} - \text{Background 1-hour Concentration}) \times \text{Persistence Factor}) + \text{Background 8-hour Concentration}$$

	A.M. Peak Hour	P.M. Peak Hour	8-Hour
25 Feet from Roadway Edge	3.3	3.3	1.8
50 Feet from Roadway Edge	3.2	3.3	1.7
100 Feet from Roadway Edge	3.2	3.2	1.7

<sup>2</sup> Methodology from Bay Area Air Quality Management District *BAAQMD CEQA Guidelines* (1996).

# SIMPLIFIED CALINE4 CARBON MONOXIDE ANALYSIS

Project Number: 10953-00  
 Project Title: City of Lake Forest Opportunities Study Program EIR

## Background Information

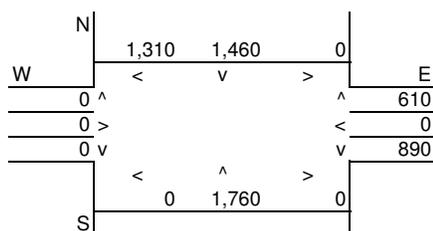
Nearest Air Monitoring Station measuring CO: Mission Viejo - 26081 Via Pera  
 Background 1-hour CO Concentration (ppm): 3.0  
 Background 8-hour CO Concentration (ppm): 1.5  
 Persistence Factor: 0.8  
 Analysis Year: 2030

## Roadway Data

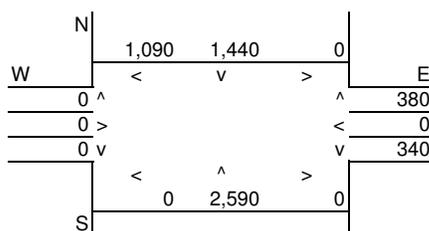
Intersection: Lake Forest & I-5 NB  
 Analysis Condition: Year 2030 Traffic Volumes - Proposed Project

	Roadway Type	No. of Lanes	Average Speed		
			A.M.	P.M.	
North-South Roadway:	Lake Forest	At Grade	6	20	20
East-West Roadway:	I-5 NB	At Grade	4	20	20

### A.M. Peak Hour Traffic Volumes



### P.M. Peak Hour Traffic Volumes



### Highest Traffic Volumes (Vehicles per Hour)

N-S Road: 5,140  
 E-W Road: 1,500

N-S Road: 5,500  
 E-W Road: 1,090

## Roadway CO Contributions and Concentrations

$$\text{Emissions} = (A \times B \times C) / 100,000^1$$

Roadway	A <sub>1</sub>	A <sub>2</sub>	A <sub>3</sub>	B	C	Estimated CO Concentrations		
	Reference CO Concentrations 25 Feet	50 Feet	100 Feet	Traffic Volume	Emission Factors <sup>2</sup>	25 Feet	50 Feet	100 Feet
A.M. Peak Traffic Hour								
North-South Road	6.1	4.9	3.5	5,140	1.09	0.34	0.27	0.20
East-West Road	2.6	2.2	1.7	1,500	1.09	0.04	0.04	0.03
P.M. Peak Traffic Hour								
North-South Road	6.1	4.9	3.5	5,500	1.09	0.37	0.29	0.21
East-West Road	2.6	2.2	1.7	1,090	1.09	0.03	0.03	0.02

<sup>1</sup> Methodology from Bay Area Air Quality Management District *BAAQMD CEQA Guidelines* (1996).

<sup>2</sup> Emission factors from EMFAC2002 (2003).

## Total Roadway CO Concentrations

$$\text{Peak Hour Emissions} = \text{North-South Concentration} + \text{East-West Concentration} + \text{Background 1-hour Concentration}^2$$

$$\text{8-Hour Emissions} = ((\text{Highest Peak Hour Concentration} - \text{Background 1-hour Concentration}) \times \text{Persistence Factor}) + \text{Background 8-hour Concentration}$$

	A.M. Peak Hour	P.M. Peak Hour	8-Hour
25 Feet from Roadway Edge	3.4	3.4	1.8
50 Feet from Roadway Edge	3.3	3.3	1.8
100 Feet from Roadway Edge	3.2	3.2	1.7

<sup>2</sup> Methodology from Bay Area Air Quality Management District *BAAQMD CEQA Guidelines* (1996).

# SIMPLIFIED CALINE4 CARBON MONOXIDE ANALYSIS

Project Number: 10953-00  
 Project Title: City of Lake Forest Opportunities Study Program EIR

## Background Information

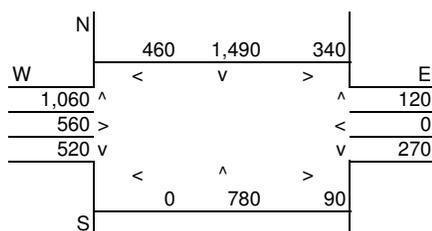
Nearest Air Monitoring Station measuring CO: Mission Viejo - 26081 Via Pera  
 Background 1-hour CO Concentration (ppm): 3.0  
 Background 8-hour CO Concentration (ppm): 1.5  
 Persistence Factor: 0.8  
 Analysis Year: 2030

## Roadway Data

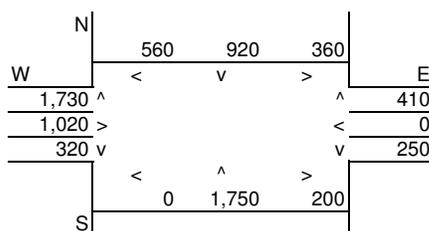
Intersection: Lake Forest & I-5 Carlota  
 Analysis Condition: Year 2030 Traffic Volumes - Proposed Project

	Roadway Type	No. of Lanes	Average Speed		
			A.M.	P.M.	
North-South Roadway:	Lake Forest	At Grade	8	15	10
East-West Roadway:	I-5 Carlota	At Grade	8	15	10

### A.M. Peak Hour Traffic Volumes



### P.M. Peak Hour Traffic Volumes



### Highest Traffic Volumes (Vehicles per Hour)

N-S Road: 4,250                      N-S Road: 5,730  
 E-W Road: 2,600                      E-W Road: 3,630

## Roadway CO Contributions and Concentrations

$$\text{Emissions} = (A \times B \times C) / 100,000^1$$

Roadway	A <sub>1</sub>	A <sub>2</sub>	A <sub>3</sub>	B	C	Estimated CO Concentrations		
	Reference CO Concentrations 25 Feet	50 Feet	100 Feet	Traffic Volume	Emission Factors <sup>2</sup>	25 Feet	50 Feet	100 Feet
A.M. Peak Traffic Hour								
North-South Road	5.7	4.6	3.4	4,250	1.23	0.30	0.24	0.18
East-West Road	2.2	1.9	1.6	2,600	1.23	0.07	0.06	0.05
P.M. Peak Traffic Hour								
North-South Road	5.7	4.6	3.4	5,730	1.41	0.46	0.37	0.27
East-West Road	2.2	1.9	1.6	3,630	1.41	0.11	0.10	0.08

<sup>1</sup> Methodology from Bay Area Air Quality Management District *BAAQMD CEQA Guidelines* (1996).

<sup>2</sup> Emission factors from EMFAC2002 (2003).

## Total Roadway CO Concentrations

$$\text{Peak Hour Emissions} = \text{North-South Concentration} + \text{East-West Concentration} + \text{Background 1-hour Concentration}^2$$

$$\text{8-Hour Emissions} = ((\text{Highest Peak Hour Concentration} - \text{Background 1-hour Concentration}) \times \text{Persistence Factor}) + \text{Background 8-hour Concentration}$$

	A.M. Peak Hour	P.M. Peak Hour	8-Hour
25 Feet from Roadway Edge	3.4	3.6	2.0
50 Feet from Roadway Edge	3.3	3.5	1.9
100 Feet from Roadway Edge	3.2	3.4	1.8

<sup>2</sup> Methodology from Bay Area Air Quality Management District *BAAQMD CEQA Guidelines* (1996).

# SIMPLIFIED CALINE4 CARBON MONOXIDE ANALYSIS

**Project Number:** 10953-00  
**Project Title:** City of Lake Forest Opportunities Study Program EIR

## Background Information

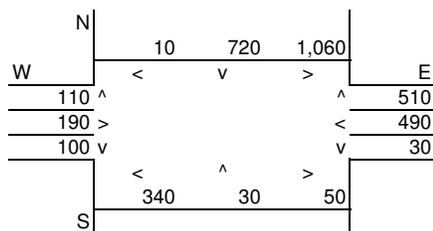
Nearest Air Monitoring Station measuring CO: Mission Viejo - 26081 Via Pera  
 Background 1-hour CO Concentration (ppm): 3.0  
 Background 8-hour CO Concentration (ppm): 1.5  
 Persistence Factor: 0.8  
 Analysis Year: 2030

## Roadway Data

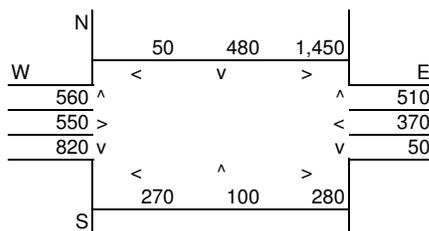
Intersection: Paseo De Valencia & Carlota  
 Analysis Condition: Year 2030 Traffic Volumes - Proposed Project

	Roadway Type	No. of Lanes	Average Speed		
			A.M.	P.M.	
North-South Roadway:	Paseo De Valencia	At Grade	8	20	5
East-West Roadway:	Carlota	At Grade	8	20	5

### A.M. Peak Hour Traffic Volumes



### P.M. Peak Hour Traffic Volumes



### Highest Traffic Volumes (Vehicles per Hour)

N-S Road:	2,440	N-S Road:	3,150
E-W Road:	2,330	E-W Road:	3,210

## Roadway CO Contributions and Concentrations

Emissions = (A x B x C) / 100,000<sup>1</sup>

Roadway	A <sub>1</sub>	A <sub>2</sub>	A <sub>3</sub>	B	C	Estimated CO Concentrations		
	Reference CO Concentrations 25 Feet	50 Feet	100 Feet	Traffic Volume	Emission Factors <sup>2</sup>	25 Feet	50 Feet	100 Feet
<b>A.M. Peak Traffic Hour</b>								
North-South Road	5.7	4.6	3.4	2,440	1.09	0.15	0.12	0.09
East-West Road	2.2	1.9	1.6	2,330	1.09	0.06	0.05	0.04
<b>P.M. Peak Traffic Hour</b>								
North-South Road	2.2	1.9	1.6	3,150	1.65	0.11	0.10	0.08
East-West Road	5.7	4.6	3.4	3,210	1.65	0.30	0.24	0.18

<sup>1</sup> Methodology from Bay Area Air Quality Management District *BAAQMD CEQA Guidelines* (1996).

<sup>2</sup> Emission factors from EMFAC2002 (2003).

## Total Roadway CO Concentrations

Peak Hour Emissions = North-South Concentration + East-West Concentration + Background 1-hour Concentration<sup>2</sup>

8-Hour Emissions = ((Highest Peak Hour Concentration - Background 1-hour Concentration) x Persistence Factor) + Background 8-hour Concentration

	A.M. Peak Hour	P.M. Peak Hour	8-Hour
25 Feet from Roadway Edge	3.2	3.4	1.8
50 Feet from Roadway Edge	3.2	3.3	1.8
100 Feet from Roadway Edge	3.1	3.3	1.7

<sup>2</sup> Methodology from Bay Area Air Quality Management District *BAAQMD CEQA Guidelines* (1996).

# SIMPLIFIED CALINE4 CARBON MONOXIDE ANALYSIS

Project Number: 10953-00  
 Project Title: City of Lake Forest Opportunities Study Program EIR

## Background Information

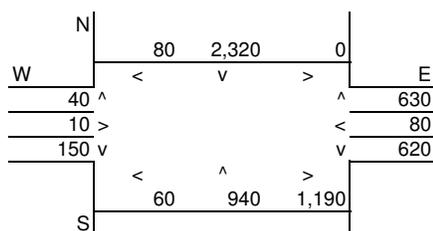
Nearest Air Monitoring Station measuring CO: Mission Viejo - 26081 Via Pera  
 Background 1-hour CO Concentration (ppm): 3.0  
 Background 8-hour CO Concentration (ppm): 1.5  
 Persistence Factor: 0.8  
 Analysis Year: 2030

## Roadway Data

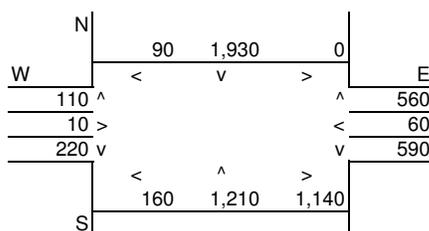
Intersection: El Toro & Bridger I-5 NB  
 Analysis Condition: Year 2030 Traffic Volumes - Proposed Project

	Roadway Type	No. of Lanes	Average Speed		
			A.M.	P.M.	
North-South Roadway:	El Toro	At Grade	8	20	20
East-West Roadway:	Bridger I-5 NB	At Grade	6	20	20

### A.M. Peak Hour Traffic Volumes



### P.M. Peak Hour Traffic Volumes



### Highest Traffic Volumes (Vehicles per Hour)

N-S Road: 5,280  
 E-W Road: 2,530

N-S Road: 5,250  
 E-W Road: 2,360

## Roadway CO Contributions and Concentrations

$$\text{Emissions} = (A \times B \times C) / 100,000^1$$

Roadway	Reference CO Concentrations			B Traffic Volume	C Emission Factors <sup>2</sup>	Estimated CO Concentrations		
	A <sub>1</sub> 25 Feet	A <sub>2</sub> 50 Feet	A <sub>3</sub> 100 Feet			25 Feet	50 Feet	100 Feet
<b>A.M. Peak Traffic Hour</b>								
North-South Road	5.7	4.6	3.4	5,280	1.09	0.33	0.26	0.20
East-West Road	2.3	2.0	1.7	2,530	1.09	0.06	0.06	0.05
<b>P.M. Peak Traffic Hour</b>								
North-South Road	5.7	4.6	3.4	5,250	1.09	0.33	0.26	0.19
East-West Road	2.3	2.0	1.7	2,360	1.09	0.06	0.05	0.04

<sup>1</sup> Methodology from Bay Area Air Quality Management District *BAAQMD CEQA Guidelines* (1996).

<sup>2</sup> Emission factors from EMFAC2002 (2003).

## Total Roadway CO Concentrations

$$\text{Peak Hour Emissions} = \text{North-South Concentration} + \text{East-West Concentration} + \text{Background 1-hour Concentration}^2$$

$$\text{8-Hour Emissions} = ((\text{Highest Peak Hour Concentration} - \text{Background 1-hour Concentration}) \times \text{Persistence Factor}) + \text{Background 8-hour Concentration}$$

	A.M. Peak Hour	P.M. Peak Hour	8-Hour
25 Feet from Roadway Edge	3.4	3.4	1.8
50 Feet from Roadway Edge	3.3	3.3	1.8
100 Feet from Roadway Edge	3.2	3.2	1.7

<sup>2</sup> Methodology from Bay Area Air Quality Management District *BAAQMD CEQA Guidelines* (1996).

# SIMPLIFIED CALINE4 CARBON MONOXIDE ANALYSIS

Project Number: 10953-00  
 Project Title: City of Lake Forest Opportunities Study Program EIR

## Background Information

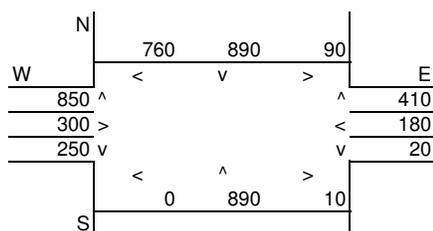
Nearest Air Monitoring Station measuring CO: Mission Viejo - 26081 Via Pera  
 Background 1-hour CO Concentration (ppm): 3.0  
 Background 8-hour CO Concentration (ppm): 1.5  
 Persistence Factor: 0.8  
 Analysis Year: 2030

## Roadway Data

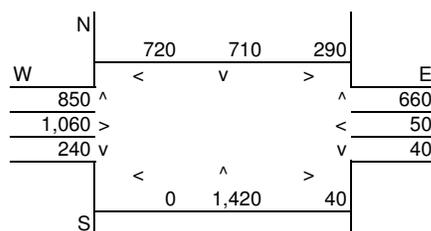
Intersection: El Toro & Avd Carlota  
 Analysis Condition: Year 2030 Traffic Volumes - Proposed Project

	Roadway Type	No. of Lanes	Average Speed		
			A.M.	P.M.	
North-South Roadway:	El Toro	At Grade	8	20	5
East-West Roadway:	Avd Carlota	At Grade	8	20	5

### A.M. Peak Hour Traffic Volumes



### P.M. Peak Hour Traffic Volumes



### Highest Traffic Volumes (Vehicles per Hour)

N-S Road:	3,890	N-S Road:	4,650
E-W Road:	2,340	E-W Road:	2,920

## Roadway CO Contributions and Concentrations

$$\text{Emissions} = (A \times B \times C) / 100,000^1$$

Roadway	A <sub>1</sub>	A <sub>2</sub>	A <sub>3</sub>	B	C	Estimated CO Concentrations		
	Reference CO Concentrations 25 Feet	50 Feet	100 Feet	Traffic Volume	Emission Factors <sup>2</sup>	25 Feet	50 Feet	100 Feet
<b>A.M. Peak Traffic Hour</b>								
North-South Road	5.7	4.6	3.4	3,890	1.09	0.24	0.20	0.14
East-West Road	2.2	1.9	1.6	2,340	1.09	0.06	0.05	0.04
<b>P.M. Peak Traffic Hour</b>								
North-South Road	5.7	4.6	3.4	4,650	1.65	0.44	0.35	0.26
East-West Road	2.2	1.9	1.6	2,920	1.65	0.11	0.09	0.08

<sup>1</sup> Methodology from Bay Area Air Quality Management District *BAAQMD CEQA Guidelines* (1996).

<sup>2</sup> Emission factors from EMFAC2002 (2003).

## Total Roadway CO Concentrations

$$\text{Peak Hour Emissions} = \text{North-South Concentration} + \text{East-West Concentration} + \text{Background 1-hour Concentration}^2$$

$$\text{8-Hour Emissions} = ((\text{Highest Peak Hour Concentration} - \text{Background 1-hour Concentration}) \times \text{Persistence Factor}) + \text{Background 8-hour Concentration}$$

	A.M. Peak Hour	P.M. Peak Hour	8-Hour
25 Feet from Roadway Edge	3.3	3.5	1.9
50 Feet from Roadway Edge	3.2	3.4	1.9
100 Feet from Roadway Edge	3.2	3.3	1.8

<sup>2</sup> Methodology from Bay Area Air Quality Management District *BAAQMD CEQA Guidelines* (1996).

# SIMPLIFIED CALINE4 CARBON MONOXIDE ANALYSIS

Project Number: 10953-00  
 Project Title: City of Lake Forest Opportunities Study Program EIR

## Background Information

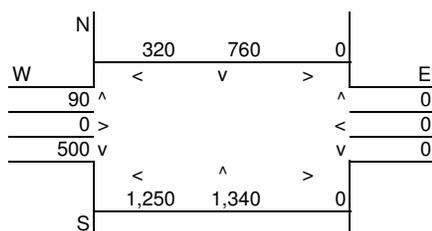
Nearest Air Monitoring Station measuring CO: Mission Viejo - 26081 Via Pera  
 Background 1-hour CO Concentration (ppm): 3.0  
 Background 8-hour CO Concentration (ppm): 1.5  
 Persistence Factor: 0.8  
 Analysis Year: 2030

## Roadway Data

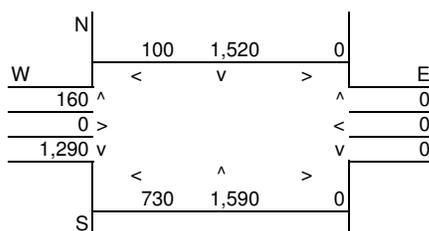
Intersection: Portola & Rancho  
 Analysis Condition: Year 2030 Traffic Volumes - Proposed Project

	Roadway Type	No. of Lanes	Average Speed		
			A.M.	P.M.	
North-South Roadway:	Portola	At Grade	8	20	20
East-West Roadway:	Rancho	At Grade	4	20	20

### A.M. Peak Hour Traffic Volumes



### P.M. Peak Hour Traffic Volumes



### Highest Traffic Volumes (Vehicles per Hour)

N-S Road:	3,850	N-S Road:	5,130
E-W Road:	2,160	E-W Road:	2,280

## Roadway CO Contributions and Concentrations

$$\text{Emissions} = (A \times B \times C) / 100,000^1$$

Roadway	A <sub>1</sub>	A <sub>2</sub>	A <sub>3</sub>	B	C	Estimated CO Concentrations		
	Reference CO Concentrations 25 Feet	50 Feet	100 Feet	Traffic Volume	Emission Factors <sup>2</sup>	25 Feet	50 Feet	100 Feet
<b>A.M. Peak Traffic Hour</b>								
North-South Road	5.7	4.6	3.4	3,850	1.09	0.24	0.19	0.14
East-West Road	2.6	2.2	1.7	2,160	1.09	0.06	0.05	0.04
<b>P.M. Peak Traffic Hour</b>								
North-South Road	5.7	4.6	3.4	5,130	1.09	0.32	0.26	0.19
East-West Road	2.6	2.2	1.7	2,280	1.09	0.06	0.05	0.04

<sup>1</sup> Methodology from Bay Area Air Quality Management District *BAAQMD CEQA Guidelines* (1996).

<sup>2</sup> Emission factors from EMFAC2002 (2003).

## Total Roadway CO Concentrations

$$\text{Peak Hour Emissions} = \text{North-South Concentration} + \text{East-West Concentration} + \text{Background 1-hour Concentration}^2$$

$$\text{8-Hour Emissions} = ((\text{Highest Peak Hour Concentration} - \text{Background 1-hour Concentration}) \times \text{Persistence Factor}) + \text{Background 8-hour Concentration}$$

	A.M. Peak Hour	P.M. Peak Hour	8-Hour
25 Feet from Roadway Edge	3.3	3.4	1.8
50 Feet from Roadway Edge	3.2	3.3	1.7
100 Feet from Roadway Edge	3.2	3.2	1.7

<sup>2</sup> Methodology from Bay Area Air Quality Management District *BAAQMD CEQA Guidelines* (1996).

# SIMPLIFIED CALINE4 CARBON MONOXIDE ANALYSIS

**Project Number:** 10953-00  
**Project Title:** City of Lake Forest Opportunities Study Program EIR

## Background Information

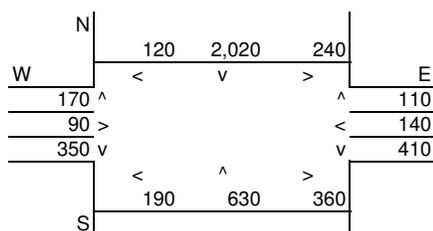
Nearest Air Monitoring Station measuring CO: Mission Viejo - 26081 Via Pera  
 Background 1-hour CO Concentration (ppm): 3.0  
 Background 8-hour CO Concentration (ppm): 1.5  
 Persistence Factor: 0.8  
 Analysis Year: 2030

## Roadway Data

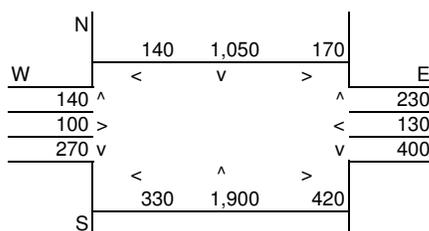
Intersection: Alton & Towne Centre Dr.  
 Analysis Condition: Year 2030 Traffic Volumes - Proposed Project

	Roadway Type	No. of Lanes	Average Speed		
			A.M.	P.M.	
North-South Roadway:	Alton	At Grade	8	10	20
East-West Roadway:	Towne Centre Dr.	At Grade	6	10	20

### A.M. Peak Hour Traffic Volumes



### P.M. Peak Hour Traffic Volumes



### Highest Traffic Volumes (Vehicles per Hour)

N-S Road: 3,960                      N-S Road: 4,370  
 E-W Road: 1,350                      E-W Road: 1,450

## Roadway CO Contributions and Concentrations

Emissions = (A x B x C) / 100,000<sup>1</sup>

Roadway	A <sub>1</sub>	A <sub>2</sub>	A <sub>3</sub>	B	C	Estimated CO Concentrations		
	Reference CO Concentrations 25 Feet	50 Feet	100 Feet	Traffic Volume	Emission Factors <sup>2</sup>	25 Feet	50 Feet	100 Feet
<b>A.M. Peak Traffic Hour</b>								
North-South Road	5.7	4.6	3.4	3,960	1.41	0.32	0.26	0.19
East-West Road	2.3	2.0	1.7	1,350	1.41	0.04	0.04	0.03
<b>P.M. Peak Traffic Hour</b>								
North-South Road	5.7	4.6	3.4	4,370	1.09	0.27	0.22	0.16
East-West Road	2.3	2.0	1.7	1,450	1.09	0.04	0.03	0.03

<sup>1</sup> Methodology from Bay Area Air Quality Management District *BAAQMD CEQA Guidelines* (1996).

<sup>2</sup> Emission factors from EMFAC2002 (2003).

## Total Roadway CO Concentrations

Peak Hour Emissions = North-South Concentration + East-West Concentration + Background 1-hour Concentration<sup>2</sup>

8-Hour Emissions = ((Highest Peak Hour Concentration - Background 1-hour Concentration) x Persistence Factor) + Background 8-hour Concentration

	A.M. Peak Hour	P.M. Peak Hour	8-Hour
25 Feet from Roadway Edge	3.4	3.3	1.8
50 Feet from Roadway Edge	3.3	3.3	1.7
100 Feet from Roadway Edge	3.2	3.2	1.7

<sup>2</sup> Methodology from Bay Area Air Quality Management District *BAAQMD CEQA Guidelines* (1996).

# SIMPLIFIED CALINE4 CARBON MONOXIDE ANALYSIS

**Project Number:** 10953-00  
**Project Title:** City of Lake Forest Opportunities Study Program EIR

## Background Information

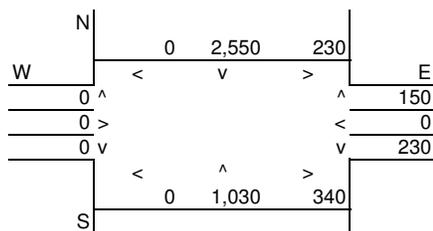
Nearest Air Monitoring Station measuring CO: Mission Viejo - 26081 Via Pera  
 Background 1-hour CO Concentration (ppm): 3.0  
 Background 8-hour CO Concentration (ppm): 1.5  
 Persistence Factor: 0.8  
 Analysis Year: 2030

## Roadway Data

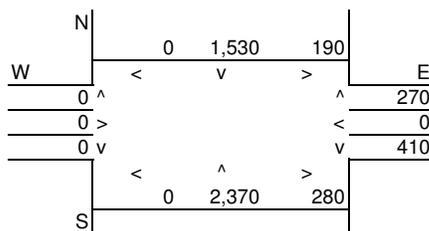
Intersection: Alton & Commercentre  
 Analysis Condition: Year 2030 Traffic Volumes - Proposed Project

	Roadway Type	No. of Lanes	Average Speed		
			A.M.	P.M.	
North-South Roadway:	Alton	At Grade	8	20	20
East-West Roadway:	Commercentre	At Grade	4	20	20

### A.M. Peak Hour Traffic Volumes



### P.M. Peak Hour Traffic Volumes



### Highest Traffic Volumes (Vehicles per Hour)

N-S Road:	4,150	N-S Road:	4,590
E-W Road:	950	E-W Road:	1,150

## Roadway CO Contributions and Concentrations

Emissions = (A x B x C) / 100,000<sup>1</sup>

Roadway	A <sub>1</sub>	A <sub>2</sub>	A <sub>3</sub>	B	C	Estimated CO Concentrations		
	Reference CO Concentrations 25 Feet	50 Feet	100 Feet	Traffic Volume	Emission Factors <sup>2</sup>	25 Feet	50 Feet	100 Feet
<b>A.M. Peak Traffic Hour</b>								
North-South Road	5.7	4.6	3.4	4,150	1.09	0.26	0.21	0.15
East-West Road	2.6	2.2	1.7	950	1.09	0.03	0.02	0.02
<b>P.M. Peak Traffic Hour</b>								
North-South Road	5.7	4.6	3.4	4,590	1.09	0.29	0.23	0.17
East-West Road	2.6	2.2	1.7	1,150	1.09	0.03	0.03	0.02

<sup>1</sup> Methodology from Bay Area Air Quality Management District *BAAQMD CEQA Guidelines* (1996).

<sup>2</sup> Emission factors from EMFAC2002 (2003).

## Total Roadway CO Concentrations

Peak Hour Emissions = North-South Concentration + East-West Concentration + Background 1-hour Concentration<sup>2</sup>

8-Hour Emissions = ((Highest Peak Hour Concentration - Background 1-hour Concentration) x Persistence Factor) + Background 8-hour Concentration

	A.M. Peak Hour	P.M. Peak Hour	8-Hour
25 Feet from Roadway Edge	3.3	3.3	1.8
50 Feet from Roadway Edge	3.2	3.3	1.7
100 Feet from Roadway Edge	3.2	3.2	1.7

<sup>2</sup> Methodology from Bay Area Air Quality Management District *BAAQMD CEQA Guidelines* (1996).

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**CO Analysis in Project Area—Landowner Concept Plan Build-out**

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# SIMPLIFIED CALINE4 CARBON MONOXIDE ANALYSIS

Project Number: 10953-00  
 Project Title: City of Lake Forest Opportunities Study Program EIR

## Background Information

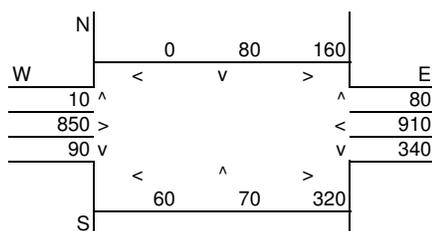
Nearest Air Monitoring Station measuring CO: Mission Viejo - 26081 Via Pera  
 Background 1-hour CO Concentration (ppm): 3.0  
 Background 8-hour CO Concentration (ppm): 1.5  
 Persistence Factor: 0.8  
 Analysis Year: 2030

## Roadway Data

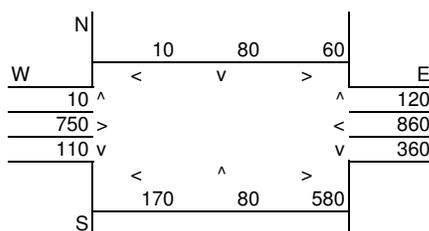
Intersection: Alton & Portola  
 Analysis Condition: Year 2030 Traffic Volumes - Landowner Concept Plan

	Roadway Type	No. of Lanes	Average Speed		
			A.M.	P.M.	
North-South Roadway:	Alton	At Grade	8	20	20
East-West Roadway:	Portola	At Grade	8	20	20

### A.M. Peak Hour Traffic Volumes



### P.M. Peak Hour Traffic Volumes



### Highest Traffic Volumes (Vehicles per Hour)

N-S Road: 960  
 E-W Road: 2,660  
 N-S Road: 1,380  
 E-W Road: 2,730

## Roadway CO Contributions and Concentrations

$$\text{Emissions} = (A \times B \times C) / 100,000^1$$

Roadway	A <sub>1</sub>	A <sub>2</sub>	A <sub>3</sub>	B	C	Estimated CO Concentrations		
	Reference CO Concentrations 25 Feet	50 Feet	100 Feet	Traffic Volume	Emission Factors <sup>2</sup>	25 Feet	50 Feet	100 Feet
A.M. Peak Traffic Hour								
North-South Road	2.2	1.9	1.6	960	1.09	0.02	0.02	0.02
East-West Road	5.7	4.6	3.4	2,660	1.09	0.17	0.13	0.10
P.M. Peak Traffic Hour								
North-South Road	2.2	1.9	1.6	1,380	1.09	0.03	0.03	0.02
East-West Road	5.7	4.6	3.4	2,730	1.09	0.17	0.14	0.10

<sup>1</sup> Methodology from Bay Area Air Quality Management District *BAAQMD CEQA Guidelines* (1996).

<sup>2</sup> Emission factors from EMFAC2002 (2003).

## Total Roadway CO Concentrations

$$\text{Peak Hour Emissions} = \text{North-South Concentration} + \text{East-West Concentration} + \text{Background 1-hour Concentration}^2$$

$$\text{8-Hour Emissions} = ((\text{Highest Peak Hour Concentration} - \text{Background 1-hour Concentration}) \times \text{Persistence Factor}) + \text{Background 8-hour Concentration}$$

	A.M. Peak Hour	P.M. Peak Hour	8-Hour
25 Feet from Roadway Edge	3.2	3.2	1.7
50 Feet from Roadway Edge	3.2	3.2	1.6
100 Feet from Roadway Edge	3.1	3.1	1.6

<sup>2</sup> Methodology from Bay Area Air Quality Management District *BAAQMD CEQA Guidelines* (1996).

# SIMPLIFIED CALINE4 CARBON MONOXIDE ANALYSIS

Project Number: 10953-00  
 Project Title: City of Lake Forest Opportunities Study Program EIR

## Background Information

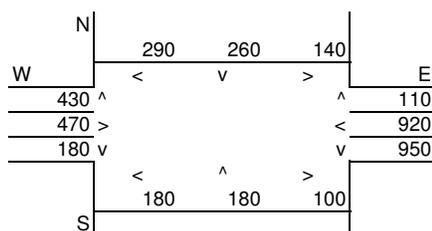
Nearest Air Monitoring Station measuring CO: Mission Viejo - 26081 Via Pera  
 Background 1-hour CO Concentration (ppm): 3.0  
 Background 8-hour CO Concentration (ppm): 1.5  
 Persistence Factor: 0.8  
 Analysis Year: 2030

## Roadway Data

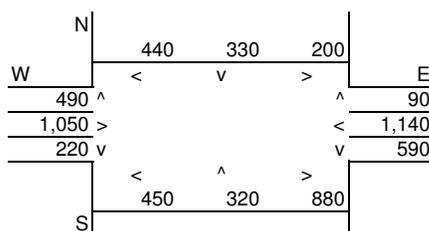
Intersection: Bake & Portola  
 Analysis Condition: Year 2030 Traffic Volumes - Landowner Concept Plan

	Roadway Type	No. of Lanes	Average Speed		
			A.M.	P.M.	
North-South Roadway:	Bake	At Grade	8	20	5
East-West Roadway:	Portola	At Grade	8	20	5

### A.M. Peak Hour Traffic Volumes



### P.M. Peak Hour Traffic Volumes



### Highest Traffic Volumes (Vehicles per Hour)

N-S Road:	1,850	N-S Road:	2,790
E-W Road:	2,690	E-W Road:	3,950

## Roadway CO Contributions and Concentrations

Emissions = (A x B x C) / 100,000<sup>1</sup>

Roadway	A <sub>1</sub>	A <sub>2</sub>	A <sub>3</sub>	B	C	Estimated CO Concentrations		
	Reference CO Concentrations 25 Feet	50 Feet	100 Feet	Traffic Volume	Emission Factors <sup>2</sup>	25 Feet	50 Feet	100 Feet
A.M. Peak Traffic Hour								
North-South Road	2.2	1.9	1.6	1,850	1.09	0.04	0.04	0.03
East-West Road	5.7	4.6	3.4	2,690	1.09	0.17	0.13	0.10
P.M. Peak Traffic Hour								
North-South Road	2.2	1.9	1.6	2,790	1.65	0.10	0.09	0.07
East-West Road	5.7	4.6	3.4	3,950	1.65	0.37	0.30	0.22

<sup>1</sup> Methodology from Bay Area Air Quality Management District *BAAQMD CEQA Guidelines* (1996).

<sup>2</sup> Emission factors from EMFAC2002 (2003).

## Total Roadway CO Concentrations

Peak Hour Emissions = North-South Concentration + East-West Concentration + Background 1-hour Concentration<sup>2</sup>

8-Hour Emissions = ((Highest Peak Hour Concentration - Background 1-hour Concentration) x Persistence Factor) + Background 8-hour Concentration

	A.M. Peak Hour	P.M. Peak Hour	8-Hour
25 Feet from Roadway Edge	3.2	3.5	1.9
50 Feet from Roadway Edge	3.2	3.4	1.8
100 Feet from Roadway Edge	3.1	3.3	1.7

<sup>2</sup> Methodology from Bay Area Air Quality Management District *BAAQMD CEQA Guidelines* (1996).



# SIMPLIFIED CALINE4 CARBON MONOXIDE ANALYSIS

**Project Number:** 10953-00  
**Project Title:** City of Lake Forest Opportunities Study Program EIR

## Background Information

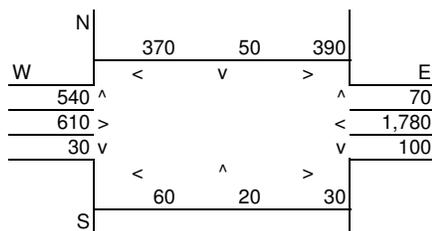
Nearest Air Monitoring Station measuring CO: Mission Viejo - 26081 Via Pera  
 Background 1-hour CO Concentration (ppm): 3.0  
 Background 8-hour CO Concentration (ppm): 1.5  
 Persistence Factor: 0.8  
 Analysis Year: 2030

## Roadway Data

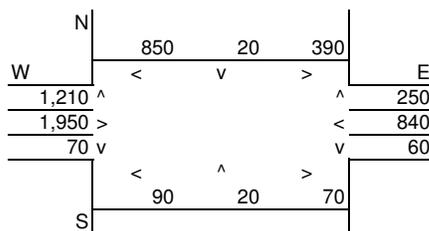
Intersection: Glenn Ranch & Portola  
 Analysis Condition: Year 2030 Traffic Volumes - Landowner Concept Plan

	Roadway Type	No. of Lanes	Average Speed		
			A.M.	P.M.	
North-South Roadway:	Glenn Ranch	At Grade	8	20	20
East-West Roadway:	Portola	At Grade	8	20	20

### A.M. Peak Hour Traffic Volumes



### P.M. Peak Hour Traffic Volumes



### Highest Traffic Volumes (Vehicles per Hour)

N-S Road:	1,440	N-S Road:	2,740
E-W Road:	3,390	E-W Road:	5,010

## Roadway CO Contributions and Concentrations

Emissions = (A x B x C) / 100,000<sup>1</sup>

Roadway	Reference CO Concentrations			B Traffic Volume	C Emission Factors <sup>2</sup>	Estimated CO Concentrations		
	A <sub>1</sub> 25 Feet	A <sub>2</sub> 50 Feet	A <sub>3</sub> 100 Feet			25 Feet	50 Feet	100 Feet
<b>A.M. Peak Traffic Hour</b>								
North-South Road	2.2	1.9	1.6	1,440	1.09	0.03	0.03	0.03
East-West Road	5.7	4.6	3.4	3,390	1.09	0.21	0.17	0.13
<b>P.M. Peak Traffic Hour</b>								
North-South Road	2.2	1.9	1.6	2,740	1.09	0.07	0.06	0.05
East-West Road	5.7	4.6	3.4	5,010	1.09	0.31	0.25	0.19

<sup>1</sup> Methodology from Bay Area Air Quality Management District *BAAQMD CEQA Guidelines* (1996).

<sup>2</sup> Emission factors from EMFAC2002 (2003).

## Total Roadway CO Concentrations

Peak Hour Emissions = North-South Concentration + East-West Concentration + Background 1-hour Concentration<sup>2</sup>

8-Hour Emissions = ((Highest Peak Hour Concentration - Background 1-hour Concentration) x Persistence Factor) + Background 8-hour Concentration

	A.M. Peak Hour	P.M. Peak Hour	8-Hour
25 Feet from Roadway Edge	3.2	3.4	1.8
50 Feet from Roadway Edge	3.2	3.3	1.7
100 Feet from Roadway Edge	3.2	3.2	1.7

<sup>2</sup> Methodology from Bay Area Air Quality Management District *BAAQMD CEQA Guidelines* (1996).

# SIMPLIFIED CALINE4 CARBON MONOXIDE ANALYSIS

Project Number: 10953-00  
 Project Title: City of Lake Forest Opportunities Study Program EIR

## Background Information

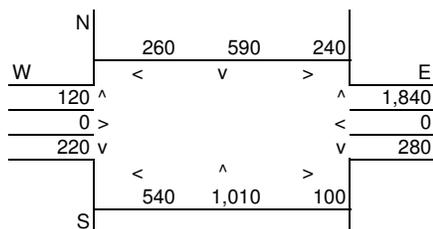
Nearest Air Monitoring Station measuring CO: Mission Viejo - 26081 Via Pera  
 Background 1-hour CO Concentration (ppm): 3.0  
 Background 8-hour CO Concentration (ppm): 1.5  
 Persistence Factor: 0.8  
 Analysis Year: 2030

## Roadway Data

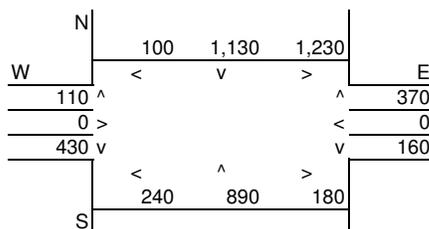
Intersection: Portola & SR-241 Ramps  
 Analysis Condition: Year 2030 Traffic Volumes - Landowner Concept Plan

	Roadway Type	No. of Lanes	Average Speed		
			A.M.	P.M.	
North-South Roadway:	Portola	At Grade	8	20	20
East-West Roadway:	SR-241 Ramps	At Grade	4	20	20

### A.M. Peak Hour Traffic Volumes



### P.M. Peak Hour Traffic Volumes



### Highest Traffic Volumes (Vehicles per Hour)

N-S Road: 4,060  
 E-W Road: 2,460  
 N-S Road: 3,830  
 E-W Road: 1,940

## Roadway CO Contributions and Concentrations

$$\text{Emissions} = (A \times B \times C) / 100,000^1$$

Roadway	A <sub>1</sub>	A <sub>2</sub>	A <sub>3</sub>	B	C	Estimated CO Concentrations		
	Reference CO Concentrations 25 Feet	50 Feet	100 Feet	Traffic Volume	Emission Factors <sup>2</sup>	25 Feet	50 Feet	100 Feet
<b>A.M. Peak Traffic Hour</b>								
North-South Road	5.7	4.6	3.4	4,060	1.09	0.25	0.20	0.15
East-West Road	2.6	2.2	1.7	2,460	1.09	0.07	0.06	0.05
<b>P.M. Peak Traffic Hour</b>								
North-South Road	5.7	4.6	3.4	3,830	1.09	0.24	0.19	0.14
East-West Road	2.6	2.2	1.7	1,940	1.09	0.05	0.05	0.04

<sup>1</sup> Methodology from Bay Area Air Quality Management District *BAAQMD CEQA Guidelines* (1996).

<sup>2</sup> Emission factors from EMFAC2002 (2003).

## Total Roadway CO Concentrations

$$\text{Peak Hour Emissions} = \text{North-South Concentration} + \text{East-West Concentration} + \text{Background 1-hour Concentration}^2$$

$$\text{8-Hour Emissions} = ((\text{Highest Peak Hour Concentration} - \text{Background 1-hour Concentration}) \times \text{Persistence Factor}) + \text{Background 8-hour Concentration}$$

	A.M. Peak Hour	P.M. Peak Hour	8-Hour
25 Feet from Roadway Edge	3.3	3.3	1.8
50 Feet from Roadway Edge	3.3	3.2	1.7
100 Feet from Roadway Edge	3.2	3.2	1.7

<sup>2</sup> Methodology from Bay Area Air Quality Management District *BAAQMD CEQA Guidelines* (1996).

# SIMPLIFIED CALINE4 CARBON MONOXIDE ANALYSIS

**Project Number:** 10953-00  
**Project Title:** City of Lake Forest Opportunities Study Program EIR

## Background Information

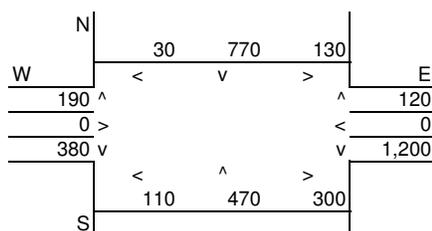
Nearest Air Monitoring Station measuring CO: Mission Viejo - 26081 Via Pera  
 Background 1-hour CO Concentration (ppm): 3.0  
 Background 8-hour CO Concentration (ppm): 1.5  
 Persistence Factor: 0.8  
 Analysis Year: 2030

## Roadway Data

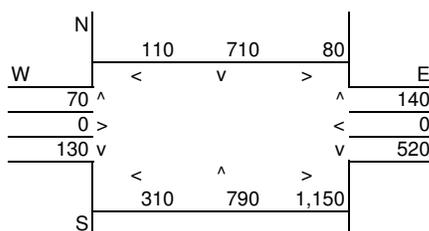
Intersection: Alton & SR-241 Ramps  
 Analysis Condition: Year 2030 Traffic Volumes - Landowner Concept Plan

	Roadway Type	No. of Lanes	Average Speed		
			A.M.	P.M.	
North-South Roadway:	Alton	At Grade	8	20	20
East-West Roadway:	SR-241 Ramps	At Grade	4	20	20

### A.M. Peak Hour Traffic Volumes



### P.M. Peak Hour Traffic Volumes



### Highest Traffic Volumes (Vehicles per Hour)

N-S Road: 3,230                      N-S Road: 3,610  
 E-W Road: 1,750                      E-W Road: 1,890

## Roadway CO Contributions and Concentrations

Emissions = (A x B x C) / 100,000<sup>1</sup>

Roadway	A <sub>1</sub>	A <sub>2</sub>	A <sub>3</sub>	B	C	Estimated CO Concentrations		
	Reference CO Concentrations 25 Feet	50 Feet	100 Feet	Traffic Volume	Emission Factors <sup>2</sup>	25 Feet	50 Feet	100 Feet
<b>A.M. Peak Traffic Hour</b>								
North-South Road	5.7	4.6	3.4	3,230	1.09	0.20	0.16	0.12
East-West Road	2.6	2.2	1.7	1,750	1.09	0.05	0.04	0.03
<b>P.M. Peak Traffic Hour</b>								
North-South Road	5.7	4.6	3.4	3,610	1.09	0.22	0.18	0.13
East-West Road	2.6	2.2	1.7	1,890	1.09	0.05	0.05	0.04

<sup>1</sup> Methodology from Bay Area Air Quality Management District *BAAQMD CEQA Guidelines* (1996).

<sup>2</sup> Emission factors from EMFAC2002 (2003).

## Total Roadway CO Concentrations

Peak Hour Emissions = North-South Concentration + East-West Concentration + Background 1-hour Concentration<sup>2</sup>

8-Hour Emissions = ((Highest Peak Hour Concentration - Background 1-hour Concentration) x Persistence Factor) + Background 8-hour Concentration

	A.M. Peak Hour	P.M. Peak Hour	8-Hour
25 Feet from Roadway Edge	3.3	3.3	1.7
50 Feet from Roadway Edge	3.2	3.2	1.7
100 Feet from Roadway Edge	3.2	3.2	1.6

<sup>2</sup> Methodology from Bay Area Air Quality Management District *BAAQMD CEQA Guidelines* (1996).

# SIMPLIFIED CALINE4 CARBON MONOXIDE ANALYSIS

**Project Number:** 10953-00  
**Project Title:** City of Lake Forest Opportunities Study Program EIR

## Background Information

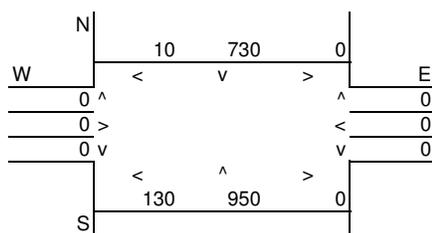
Nearest Air Monitoring Station measuring CO: Mission Viejo - 26081 Via Pera  
 Background 1-hour CO Concentration (ppm): 3.0  
 Background 8-hour CO Concentration (ppm): 1.5  
 Persistence Factor: 0.8  
 Analysis Year: 2030

## Roadway Data

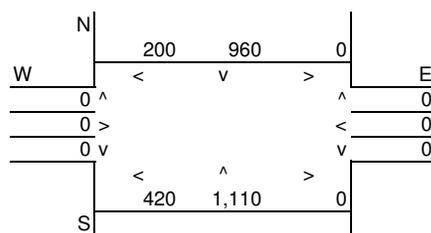
Intersection: Lake Forest & SR-241 NB  
 Analysis Condition: Year 2030 Traffic Volumes - Landowner Concept Plan

	Roadway Type	No. of Lanes	Average Speed		
			A.M.	P.M.	
North-South Roadway:	Lake Forest	At Grade	8	20	20
East-West Roadway:	SR-241 NB	At Grade	2	20	20

### A.M. Peak Hour Traffic Volumes



### P.M. Peak Hour Traffic Volumes



### Highest Traffic Volumes (Vehicles per Hour)

N-S Road:	1,810	N-S Road:	2,490
E-W Road:	140	E-W Road:	620

## Roadway CO Contributions and Concentrations

Emissions = (A x B x C) / 100,000<sup>1</sup>

Roadway	A <sub>1</sub>	A <sub>2</sub>	A <sub>3</sub>	B	C	Estimated CO Concentrations		
	Reference CO Concentrations 25 Feet	50 Feet	100 Feet	Traffic Volume	Emission Factors <sup>2</sup>	25 Feet	50 Feet	100 Feet
<b>A.M. Peak Traffic Hour</b>								
North-South Road	5.7	4.6	3.4	1,810	1.09	0.11	0.09	0.07
East-West Road	2.7	2.2	1.7	140	1.09	0.00	0.00	0.00
<b>P.M. Peak Traffic Hour</b>								
North-South Road	5.7	4.6	3.4	2,490	1.09	0.15	0.12	0.09
East-West Road	2.7	2.2	1.7	620	1.09	0.02	0.01	0.01

<sup>1</sup> Methodology from Bay Area Air Quality Management District *BAAQMD CEQA Guidelines* (1996).

<sup>2</sup> Emission factors from EMFAC2002 (2003).

## Total Roadway CO Concentrations

Peak Hour Emissions = North-South Concentration + East-West Concentration + Background 1-hour Concentration<sup>2</sup>

8-Hour Emissions = ((Highest Peak Hour Concentration - Background 1-hour Concentration) x Persistence Factor) + Background 8-hour Concentration

	A.M. Peak Hour	P.M. Peak Hour	8-Hour
25 Feet from Roadway Edge	3.1	3.2	1.6
50 Feet from Roadway Edge	3.1	3.1	1.6
100 Feet from Roadway Edge	3.1	3.1	1.6

<sup>2</sup> Methodology from Bay Area Air Quality Management District *BAAQMD CEQA Guidelines* (1996).

# SIMPLIFIED CALINE4 CARBON MONOXIDE ANALYSIS

Project Number: 10953-00  
 Project Title: City of Lake Forest Opportunities Study Program EIR

## Background Information

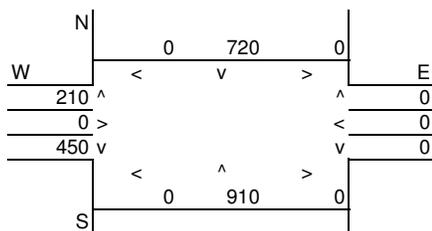
Nearest Air Monitoring Station measuring CO: Mission Viejo - 26081 Via Pera  
 Background 1-hour CO Concentration (ppm): 3.0  
 Background 8-hour CO Concentration (ppm): 1.5  
 Persistence Factor: 0.8  
 Analysis Year: 2030

## Roadway Data

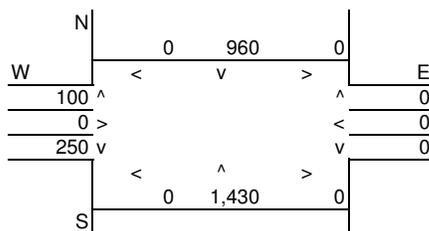
Intersection: Lake Forest & SR-241 SB  
 Analysis Condition: Year 2030 Traffic Volumes - Landowner Concept Plan

	Roadway Type	No. of Lanes	Average Speed		
			A.M.	P.M.	
North-South Roadway:	Lake Forest	At Grade	4	20	20
East-West Roadway:	SR-241 SB	At Grade	4	20	20

### A.M. Peak Hour Traffic Volumes



### P.M. Peak Hour Traffic Volumes



### Highest Traffic Volumes (Vehicles per Hour)

N-S Road: 2,080	N-S Road: 2,640
E-W Road: 660	E-W Road: 350

## Roadway CO Contributions and Concentrations

Emissions = (A x B x C) / 100,000<sup>1</sup>

Roadway	A <sub>1</sub>	A <sub>2</sub>	A <sub>3</sub>	B	C	Estimated CO Concentrations		
	Reference CO Concentrations 25 Feet	50 Feet	100 Feet	Traffic Volume	Emission Factors <sup>2</sup>	25 Feet	50 Feet	100 Feet
<b>A.M. Peak Traffic Hour</b>								
North-South Road	7.0	5.4	3.8	2,080	1.09	0.16	0.12	0.09
East-West Road	2.6	2.2	1.7	660	1.09	0.02	0.02	0.01
<b>P.M. Peak Traffic Hour</b>								
North-South Road	7.0	5.4	3.8	2,640	1.09	0.20	0.16	0.11
East-West Road	2.6	2.2	1.7	350	1.09	0.01	0.01	0.01

<sup>1</sup> Methodology from Bay Area Air Quality Management District *BAAQMD CEQA Guidelines* (1996).

<sup>2</sup> Emission factors from EMFAC2002 (2003).

## Total Roadway CO Concentrations

Peak Hour Emissions = North-South Concentration + East-West Concentration + Background 1-hour Concentration<sup>2</sup>

8-Hour Emissions = ((Highest Peak Hour Concentration - Background 1-hour Concentration) x Persistence Factor) + Background 8-hour Concentration

	A.M. Peak Hour	P.M. Peak Hour	8-Hour
25 Feet from Roadway Edge	3.2	3.2	1.7
50 Feet from Roadway Edge	3.1	3.2	1.6
100 Feet from Roadway Edge	3.1	3.1	1.6

<sup>2</sup> Methodology from Bay Area Air Quality Management District *BAAQMD CEQA Guidelines* (1996).

# SIMPLIFIED CALINE4 CARBON MONOXIDE ANALYSIS

Project Number: 10953-00  
 Project Title: City of Lake Forest Opportunities Study Program EIR

## Background Information

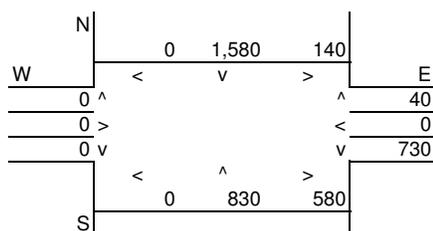
Nearest Air Monitoring Station measuring CO: Mission Viejo - 26081 Via Pera  
 Background 1-hour CO Concentration (ppm): 3.0  
 Background 8-hour CO Concentration (ppm): 1.5  
 Persistence Factor: 0.8  
 Analysis Year: 2030

## Roadway Data

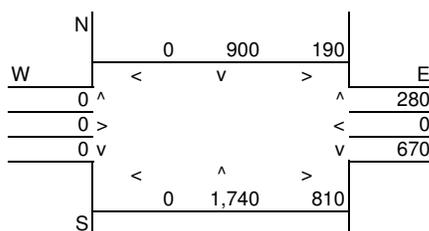
Intersection: Bake & Rancho North  
 Analysis Condition: Year 2030 Traffic Volumes - Landowner Concept Plan

	Roadway Type	No. of Lanes	Average Speed		
			A.M.	P.M.	
North-South Roadway:	Bake	At Grade	6	20	15
East-West Roadway:	Rancho North	At Grade	4	20	15

### A.M. Peak Hour Traffic Volumes



### P.M. Peak Hour Traffic Volumes



### Highest Traffic Volumes (Vehicles per Hour)

N-S Road: 3,720	N-S Road: 4,120
E-W Road: 1,490	E-W Road: 1,950

## Roadway CO Contributions and Concentrations

$$\text{Emissions} = (A \times B \times C) / 100,000^1$$

Roadway	A <sub>1</sub>	A <sub>2</sub>	A <sub>3</sub>	B	C	Estimated CO Concentrations		
	Reference CO Concentrations 25 Feet	50 Feet	100 Feet	Traffic Volume	Emission Factors <sup>2</sup>	25 Feet	50 Feet	100 Feet
A.M. Peak Traffic Hour								
North-South Road	6.1	4.9	3.5	3,720	1.09	0.25	0.20	0.14
East-West Road	2.6	2.2	1.7	1,490	1.09	0.04	0.04	0.03
P.M. Peak Traffic Hour								
North-South Road	6.1	4.9	3.5	4,120	1.23	0.31	0.25	0.18
East-West Road	2.6	2.2	1.7	1,950	1.23	0.06	0.05	0.04

<sup>1</sup> Methodology from Bay Area Air Quality Management District *BAAQMD CEQA Guidelines* (1996).

<sup>2</sup> Emission factors from EMFAC2002 (2003).

## Total Roadway CO Concentrations

$$\text{Peak Hour Emissions} = \text{North-South Concentration} + \text{East-West Concentration} + \text{Background 1-hour Concentration}^2$$

$$\text{8-Hour Emissions} = ((\text{Highest Peak Hour Concentration} - \text{Background 1-hour Concentration}) \times \text{Persistence Factor}) + \text{Background 8-hour Concentration}$$

	A.M. Peak Hour	P.M. Peak Hour	8-Hour
25 Feet from Roadway Edge	3.3	3.4	1.8
50 Feet from Roadway Edge	3.2	3.3	1.7
100 Feet from Roadway Edge	3.2	3.2	1.7

<sup>2</sup> Methodology from Bay Area Air Quality Management District *BAAQMD CEQA Guidelines* (1996).

# SIMPLIFIED CALINE4 CARBON MONOXIDE ANALYSIS

**Project Number:** 10953-00  
**Project Title:** City of Lake Forest Opportunities Study Program EIR

## Background Information

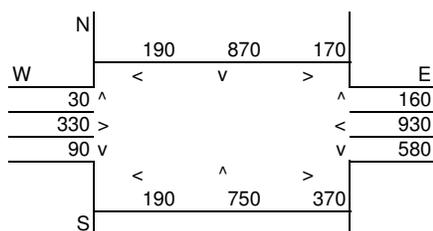
Nearest Air Monitoring Station measuring CO: Mission Viejo - 26081 Via Pera  
 Background 1-hour CO Concentration (ppm): 3.0  
 Background 8-hour CO Concentration (ppm): 1.5  
 Persistence Factor: 0.8  
 Analysis Year: 2030

## Roadway Data

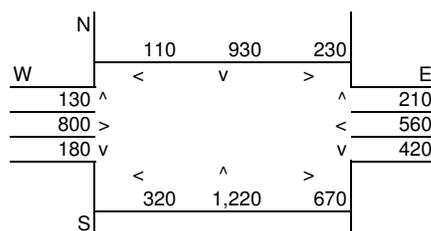
Intersection: Lake Forest & Rancho  
 Analysis Condition: Year 2030 Traffic Volumes - Landowner Concept Plan

	Roadway Type	No. of Lanes	Average Speed		
			A.M.	P.M.	
North-South Roadway:	Lake Forest	At Grade	8	10	5
East-West Roadway:	Rancho	At Grade	8	10	5

### A.M. Peak Hour Traffic Volumes



### P.M. Peak Hour Traffic Volumes



### Highest Traffic Volumes (Vehicles per Hour)

N-S Road: 2,850                      N-S Road: 3,740  
 E-W Road: 2,540                      E-W Road: 2,890

## Roadway CO Contributions and Concentrations

Emissions = (A x B x C) / 100,000<sup>1</sup>

Roadway	A <sub>1</sub>	A <sub>2</sub>	A <sub>3</sub>	B	C	Estimated CO Concentrations		
	Reference CO Concentrations 25 Feet	50 Feet	100 Feet	Traffic Volume	Emission Factors <sup>2</sup>	25 Feet	50 Feet	100 Feet
<b>A.M. Peak Traffic Hour</b>								
North-South Road	5.7	4.6	3.4	2,850	1.41	0.23	0.18	0.14
East-West Road	2.2	1.9	1.6	2,540	1.41	0.08	0.07	0.06
<b>P.M. Peak Traffic Hour</b>								
North-South Road	5.7	4.6	3.4	3,740	1.65	0.35	0.28	0.21
East-West Road	2.2	1.9	1.6	2,890	1.65	0.10	0.09	0.08

<sup>1</sup> Methodology from Bay Area Air Quality Management District *BAAQMD CEQA Guidelines* (1996).

<sup>2</sup> Emission factors from EMFAC2002 (2003).

## Total Roadway CO Concentrations

Peak Hour Emissions = North-South Concentration + East-West Concentration + Background 1-hour Concentration<sup>2</sup>

8-Hour Emissions = ((Highest Peak Hour Concentration - Background 1-hour Concentration) x Persistence Factor) + Background 8-hour Concentration

	A.M. Peak Hour	P.M. Peak Hour	8-Hour
25 Feet from Roadway Edge	3.3	3.5	1.9
50 Feet from Roadway Edge	3.3	3.4	1.8
100 Feet from Roadway Edge	3.2	3.3	1.7

<sup>2</sup> Methodology from Bay Area Air Quality Management District *BAAQMD CEQA Guidelines* (1996).

# SIMPLIFIED CALINE4 CARBON MONOXIDE ANALYSIS

Project Number: 10953-00  
 Project Title: City of Lake Forest Opportunities Study Program EIR

## Background Information

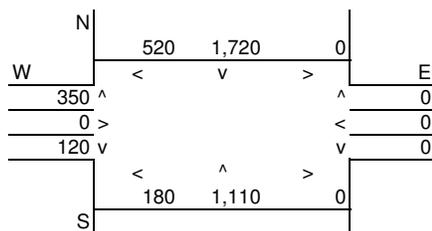
Nearest Air Monitoring Station measuring CO: Mission Viejo - 26081 Via Pera  
 Background 1-hour CO Concentration (ppm): 3.0  
 Background 8-hour CO Concentration (ppm): 1.5  
 Persistence Factor: 0.8  
 Analysis Year: 2030

## Roadway Data

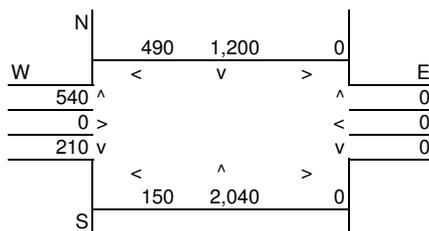
Intersection: Bake & Rancho South  
 Analysis Condition: Year 2030 Traffic Volumes - Landowner Concept Plan

	Roadway Type	No. of Lanes	Average Speed		
			A.M.	P.M.	
North-South Roadway:	Bake	At Grade	6	20	15
East-West Roadway:	Rancho South	At Grade	4	20	15

### A.M. Peak Hour Traffic Volumes



### P.M. Peak Hour Traffic Volumes



### Highest Traffic Volumes (Vehicles per Hour)

N-S Road: 3,700                      N-S Road: 4,270  
 E-W Road: 1,170                      E-W Road: 1,390

## Roadway CO Contributions and Concentrations

Emissions = (A x B x C) / 100,000<sup>1</sup>

Roadway	Reference CO Concentrations			B Traffic Volume	C Emission Factors <sup>2</sup>	Estimated CO Concentrations		
	A <sub>1</sub> 25 Feet	A <sub>2</sub> 50 Feet	A <sub>3</sub> 100 Feet			25 Feet	50 Feet	100 Feet
A.M. Peak Traffic Hour								
North-South Road	6.1	4.9	3.5	3,700	1.09	0.25	0.20	0.14
East-West Road	2.6	2.2	1.7	1,170	1.09	0.03	0.03	0.02
P.M. Peak Traffic Hour								
North-South Road	6.1	4.9	3.5	4,270	1.23	0.32	0.26	0.18
East-West Road	2.6	2.2	1.7	1,390	1.23	0.04	0.04	0.03

<sup>1</sup> Methodology from Bay Area Air Quality Management District *BAAQMD CEQA Guidelines* (1996).

<sup>2</sup> Emission factors from EMFAC2002 (2003).

## Total Roadway CO Concentrations

Peak Hour Emissions = North-South Concentration + East-West Concentration + Background 1-hour Concentration<sup>2</sup>

8-Hour Emissions = ((Highest Peak Hour Concentration - Background 1-hour Concentration) x Persistence Factor) + Background 8-hour Concentration

	A.M. Peak Hour	P.M. Peak Hour	8-Hour
25 Feet from Roadway Edge	3.3	3.4	1.8
50 Feet from Roadway Edge	3.2	3.3	1.7
100 Feet from Roadway Edge	3.2	3.2	1.7

<sup>2</sup> Methodology from Bay Area Air Quality Management District *BAAQMD CEQA Guidelines* (1996).



# SIMPLIFIED CALINE4 CARBON MONOXIDE ANALYSIS

**Project Number:** 10953-00  
**Project Title:** City of Lake Forest Opportunities Study Program EIR

## Background Information

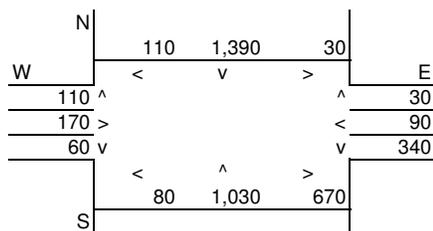
Nearest Air Monitoring Station measuring CO: Mission Viejo - 26081 Via Pera  
 Background 1-hour CO Concentration (ppm): 3.0  
 Background 8-hour CO Concentration (ppm): 1.5  
 Persistence Factor: 0.8  
 Analysis Year: 2030

## Roadway Data

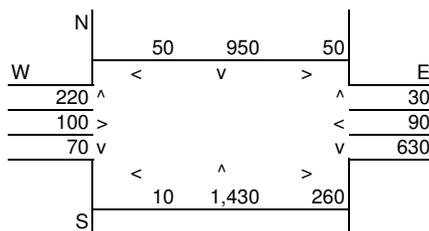
Intersection: Bake & Commercentre  
 Analysis Condition: Year 2030 Traffic Volumes - Landowner Concept Plan

	Roadway Type	No. of Lanes	Average Speed		
			A.M.	P.M.	
North-South Roadway:	Bake	At Grade	8	20	20
East-West Roadway:	Commercentre	At Grade	6	20	20

### A.M. Peak Hour Traffic Volumes



### P.M. Peak Hour Traffic Volumes



### Highest Traffic Volumes (Vehicles per Hour)

N-S Road: 3,570  
 E-W Road: 1,330

N-S Road: 3,350  
 E-W Road: 1,160

## Roadway CO Contributions and Concentrations

$$\text{Emissions} = (A \times B \times C) / 100,000^1$$

Roadway	A <sub>1</sub>	A <sub>2</sub>	A <sub>3</sub>	B	C	Estimated CO Concentrations		
	Reference CO Concentrations 25 Feet	50 Feet	100 Feet	Traffic Volume	Emission Factors <sup>2</sup>	25 Feet	50 Feet	100 Feet
<b>A.M. Peak Traffic Hour</b>								
North-South Road	5.7	4.6	3.4	3,570	1.09	0.22	0.18	0.13
East-West Road	2.3	2.0	1.7	1,330	1.09	0.03	0.03	0.02
<b>P.M. Peak Traffic Hour</b>								
North-South Road	5.7	4.6	3.4	3,350	1.09	0.21	0.17	0.12
East-West Road	2.3	2.0	1.7	1,160	1.09	0.03	0.03	0.02

<sup>1</sup> Methodology from Bay Area Air Quality Management District *BAAQMD CEQA Guidelines* (1996).

<sup>2</sup> Emission factors from EMFAC2002 (2003).

## Total Roadway CO Concentrations

$$\text{Peak Hour Emissions} = \text{North-South Concentration} + \text{East-West Concentration} + \text{Background 1-hour Concentration}^2$$

$$\text{8-Hour Emissions} = ((\text{Highest Peak Hour Concentration} - \text{Background 1-hour Concentration}) \times \text{Persistence Factor}) + \text{Background 8-hour Concentration}$$

	A.M. Peak Hour	P.M. Peak Hour	8-Hour
25 Feet from Roadway Edge	3.3	3.2	1.7
50 Feet from Roadway Edge	3.2	3.2	1.7
100 Feet from Roadway Edge	3.2	3.1	1.6

<sup>2</sup> Methodology from Bay Area Air Quality Management District *BAAQMD CEQA Guidelines* (1996).

# SIMPLIFIED CALINE4 CARBON MONOXIDE ANALYSIS

Project Number: 10953-00  
 Project Title: City of Lake Forest Opportunities Study Program EIR

## Background Information

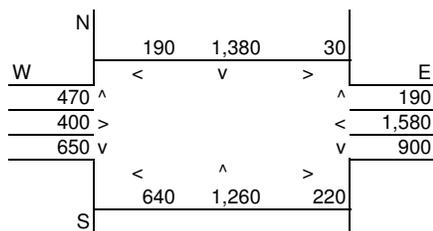
Nearest Air Monitoring Station measuring CO: Mission Viejo - 26081 Via Pera  
 Background 1-hour CO Concentration (ppm): 3.0  
 Background 8-hour CO Concentration (ppm): 1.5  
 Persistence Factor: 0.8  
 Analysis Year: 2030

## Roadway Data

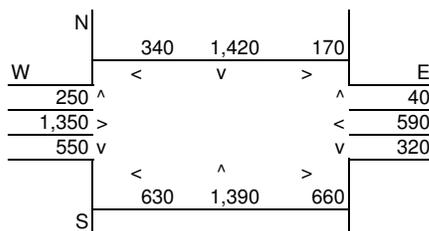
Intersection: Bake & Irvine/Trabuco  
 Analysis Condition: Year 2030 Traffic Volumes - Landowner Concept Plan

	Roadway Type	No. of Lanes	Average Speed		
			A.M.	P.M.	
North-South Roadway:	Bake	At Grade	8	5	5
East-West Roadway:	Irvine/Trabuco	At Grade	8	5	5

### A.M. Peak Hour Traffic Volumes



### P.M. Peak Hour Traffic Volumes



### Highest Traffic Volumes (Vehicles per Hour)

N-S Road:	5,050	N-S Road:	4,970
E-W Road:	3,930	E-W Road:	3,710

## Roadway CO Contributions and Concentrations

$$\text{Emissions} = (A \times B \times C) / 100,000^1$$

Roadway	A <sub>1</sub>	A <sub>2</sub>	A <sub>3</sub>	B	C	Estimated CO Concentrations		
	Reference CO Concentrations 25 Feet	50 Feet	100 Feet	Traffic Volume	Emission Factors <sup>2</sup>	25 Feet	50 Feet	100 Feet
<b>A.M. Peak Traffic Hour</b>								
North-South Road	5.7	4.6	3.4	5,050	1.65	0.47	0.38	0.28
East-West Road	2.2	1.9	1.6	3,930	1.65	0.14	0.12	0.10
<b>P.M. Peak Traffic Hour</b>								
North-South Road	5.7	4.6	3.4	4,970	1.65	0.47	0.38	0.28
East-West Road	2.2	1.9	1.6	3,710	1.65	0.13	0.12	0.10

<sup>1</sup> Methodology from Bay Area Air Quality Management District *BAAQMD CEQA Guidelines* (1996).

<sup>2</sup> Emission factors from EMFAC2002 (2003).

## Total Roadway CO Concentrations

$$\text{Peak Hour Emissions} = \text{North-South Concentration} + \text{East-West Concentration} + \text{Background 1-hour Concentration}^2$$

$$\text{8-Hour Emissions} = ((\text{Highest Peak Hour Concentration} - \text{Background 1-hour Concentration}) \times \text{Persistence Factor}) + \text{Background 8-hour Concentration}$$

	A.M. Peak Hour	P.M. Peak Hour	8-Hour
25 Feet from Roadway Edge	3.6	3.6	2.0
50 Feet from Roadway Edge	3.5	3.5	1.9
100 Feet from Roadway Edge	3.4	3.4	1.8

<sup>2</sup> Methodology from Bay Area Air Quality Management District *BAAQMD CEQA Guidelines* (1996).

# SIMPLIFIED CALINE4 CARBON MONOXIDE ANALYSIS

Project Number: 10953-00  
 Project Title: City of Lake Forest Opportunities Study Program EIR

## Background Information

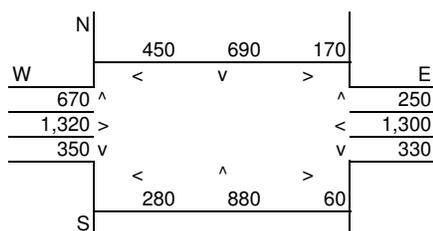
Nearest Air Monitoring Station measuring CO: Mission Viejo - 26081 Via Pera  
 Background 1-hour CO Concentration (ppm): 3.0  
 Background 8-hour CO Concentration (ppm): 1.5  
 Persistence Factor: 0.8  
 Analysis Year: 2030

## Roadway Data

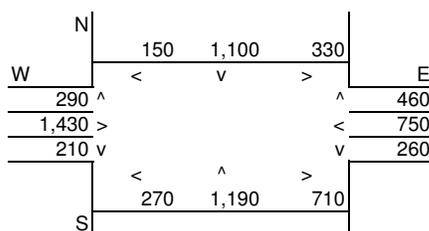
Intersection: Lake Forest & Trabuco  
 Analysis Condition: Year 2030 Traffic Volumes - Landowner Concept Plan

	Roadway Type	No. of Lanes	Average Speed		
			A.M.	P.M.	
North-South Roadway:	Lake Forest	At Grade	8	15	15
East-West Roadway:	Trabuco	At Grade	8	15	15

### A.M. Peak Hour Traffic Volumes



### P.M. Peak Hour Traffic Volumes



### Highest Traffic Volumes (Vehicles per Hour)

N-S Road:	3,110	N-S Road:	3,740
E-W Road:	4,370	E-W Road:	3,940

## Roadway CO Contributions and Concentrations

$$\text{Emissions} = (A \times B \times C) / 100,000^1$$

Roadway	A <sub>1</sub>	A <sub>2</sub>	A <sub>3</sub>	B	C	Estimated CO Concentrations		
	Reference CO Concentrations 25 Feet	Reference CO Concentrations 50 Feet	Reference CO Concentrations 100 Feet	Traffic Volume	Emission Factors <sup>2</sup>	25 Feet	50 Feet	100 Feet
A.M. Peak Traffic Hour								
North-South Road	2.2	1.9	1.6	3,110	1.23	0.08	0.07	0.06
East-West Road	5.7	4.6	3.4	4,370	1.23	0.31	0.25	0.18
P.M. Peak Traffic Hour								
North-South Road	2.2	1.9	1.6	3,740	1.23	0.10	0.09	0.07
East-West Road	5.7	4.6	3.4	3,940	1.23	0.28	0.22	0.16

<sup>1</sup> Methodology from Bay Area Air Quality Management District *BAAQMD CEQA Guidelines* (1996).

<sup>2</sup> Emission factors from EMFAC2002 (2003).

## Total Roadway CO Concentrations

$$\text{Peak Hour Emissions} = \text{North-South Concentration} + \text{East-West Concentration} + \text{Background 1-hour Concentration}^2$$

$$\text{8-Hour Emissions} = ((\text{Highest Peak Hour Concentration} - \text{Background 1-hour Concentration}) \times \text{Persistence Factor}) + \text{Background 8-hour Concentration}$$

	A.M. Peak Hour	P.M. Peak Hour	8-Hour
25 Feet from Roadway Edge	3.4	3.4	1.8
50 Feet from Roadway Edge	3.3	3.3	1.8
100 Feet from Roadway Edge	3.2	3.2	1.7

<sup>2</sup> Methodology from Bay Area Air Quality Management District *BAAQMD CEQA Guidelines* (1996).

# SIMPLIFIED CALINE4 CARBON MONOXIDE ANALYSIS

Project Number: 10953-00  
 Project Title: City of Lake Forest Opportunities Study Program EIR

## Background Information

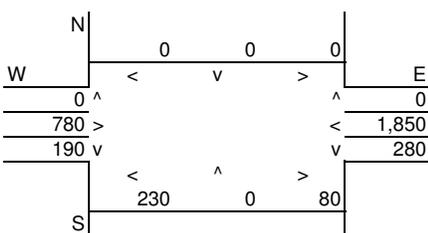
Nearest Air Monitoring Station measuring CO: Mission Viejo - 26081 Via Pera  
 Background 1-hour CO Concentration (ppm): 3.0  
 Background 8-hour CO Concentration (ppm): 1.5  
 Persistence Factor: 0.8  
 Analysis Year: 2030

## Roadway Data

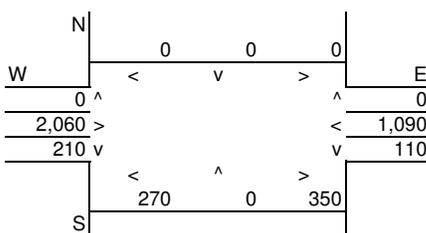
Intersection: Ridge Route & Trabuco  
 Analysis Condition: Year 2030 Traffic Volumes - Landowner Concept Plan

	Roadway Type	No. of Lanes	Average Speed		
			A.M.	P.M.	
North-South Roadway:	Lake Forest	At Grade	2	20	20
East-West Roadway:	Trabuco	At Grade	8	20	20

### A.M. Peak Hour Traffic Volumes



### P.M. Peak Hour Traffic Volumes



### Highest Traffic Volumes (Vehicles per Hour)

N-S Road:	780	N-S Road:	940
E-W Road:	3,050	E-W Road:	3,630

## Roadway CO Contributions and Concentrations

$$\text{Emissions} = (A \times B \times C) / 100,000^1$$

Roadway	A <sub>1</sub>	A <sub>2</sub>	A <sub>3</sub>	B	C	Estimated CO Concentrations		
	Reference CO Concentrations 25 Feet	50 Feet	100 Feet	Traffic Volume	Emission Factors <sup>2</sup>	25 Feet	50 Feet	100 Feet
<b>A.M. Peak Traffic Hour</b>								
North-South Road	2.7	2.2	1.7	780	1.09	0.02	0.02	0.01
East-West Road	5.7	4.6	3.4	3,050	1.09	0.19	0.15	0.11
<b>P.M. Peak Traffic Hour</b>								
North-South Road	2.7	2.2	1.7	940	1.09	0.03	0.02	0.02
East-West Road	5.7	4.6	3.4	3,630	1.09	0.23	0.18	0.13

<sup>1</sup> Methodology from Bay Area Air Quality Management District *BAAQMD CEQA Guidelines* (1996).

<sup>2</sup> Emission factors from EMFAC2002 (2003).

## Total Roadway CO Concentrations

$$\text{Peak Hour Emissions} = \text{North-South Concentration} + \text{East-West Concentration} + \text{Background 1-hour Concentration}^2$$

$$\text{8-Hour Emissions} = ((\text{Highest Peak Hour Concentration} - \text{Background 1-hour Concentration}) \times \text{Persistence Factor}) + \text{Background 8-hour Concentration}$$

	A.M. Peak Hour	P.M. Peak Hour	8-Hour
25 Feet from Roadway Edge	3.2	3.3	1.7
50 Feet from Roadway Edge	3.2	3.2	1.7
100 Feet from Roadway Edge	3.1	3.2	1.6

<sup>2</sup> Methodology from Bay Area Air Quality Management District *BAAQMD CEQA Guidelines* (1996).

# SIMPLIFIED CALINE4 CARBON MONOXIDE ANALYSIS

**Project Number:** 10953-00  
**Project Title:** City of Lake Forest Opportunities Study Program EIR

## Background Information

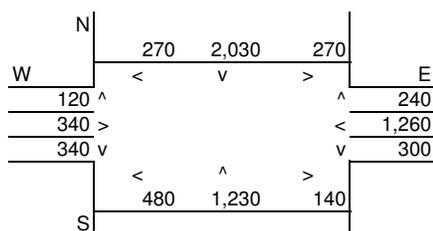
Nearest Air Monitoring Station measuring CO: Mission Viejo - 26081 Via Pera  
 Background 1-hour CO Concentration (ppm): 3.0  
 Background 8-hour CO Concentration (ppm): 1.5  
 Persistence Factor: 0.8  
 Analysis Year: 2030

## Roadway Data

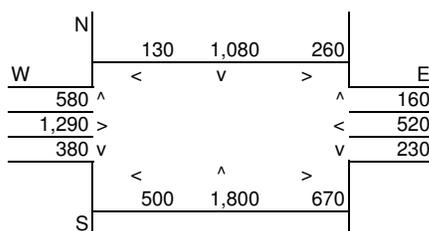
Intersection: El Toro & Trabuco  
 Analysis Condition: Year 2030 Traffic Volumes -Landowner Concept Plan

	Roadway Type	No. of Lanes	Average Speed		
			A.M.	P.M.	
North-South Roadway:	El Toro	At Grade	8	10	5
East-West Roadway:	Trabuco	At Grade	8	10	5

### A.M. Peak Hour Traffic Volumes



### P.M. Peak Hour Traffic Volumes



### Highest Traffic Volumes (Vehicles per Hour)

A.M. Peak Hour:  
 N-S Road: 4,520  
 E-W Road: 2,810

P.M. Peak Hour:  
 N-S Road: 4,660  
 E-W Road: 3,400

## Roadway CO Contributions and Concentrations

$$\text{Emissions} = (A \times B \times C) / 100,000^1$$

Roadway	Reference CO Concentrations			B Traffic Volume	C Emission Factors <sup>2</sup>	Estimated CO Concentrations		
	A <sub>1</sub> 25 Feet	A <sub>2</sub> 50 Feet	A <sub>3</sub> 100 Feet			25 Feet	50 Feet	100 Feet
<b>A.M. Peak Traffic Hour</b>								
North-South Road	5.7	4.6	3.4	4,520	1.41	0.36	0.29	0.22
East-West Road	2.2	1.9	1.6	2,810	1.41	0.09	0.08	0.06
<b>P.M. Peak Traffic Hour</b>								
North-South Road	5.7	4.6	3.4	4,660	1.65	0.44	0.35	0.26
East-West Road	2.2	1.9	1.6	3,400	1.65	0.12	0.11	0.09

<sup>1</sup> Methodology from Bay Area Air Quality Management District *BAAQMD CEQA Guidelines* (1996).

<sup>2</sup> Emission factors from EMFAC2002 (2003).

## Total Roadway CO Concentrations

$$\text{Peak Hour Emissions} = \text{North-South Concentration} + \text{East-West Concentration} + \text{Background 1-hour Concentration}^2$$

$$\text{8-Hour Emissions} = ((\text{Highest Peak Hour Concentration} - \text{Background 1-hour Concentration}) \times \text{Persistence Factor}) + \text{Background 8-hour Concentration}$$

	A.M. Peak Hour	P.M. Peak Hour	8-Hour
25 Feet from Roadway Edge	3.5	3.6	1.9
50 Feet from Roadway Edge	3.4	3.5	1.9
100 Feet from Roadway Edge	3.3	3.4	1.8

<sup>2</sup> Methodology from Bay Area Air Quality Management District *BAAQMD CEQA Guidelines* (1996).



# SIMPLIFIED CALINE4 CARBON MONOXIDE ANALYSIS

Project Number: 10953-00  
 Project Title: City of Lake Forest Opportunities Study Program EIR

## Background Information

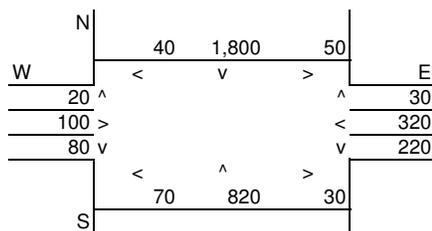
Nearest Air Monitoring Station measuring CO: Mission Viejo - 26081 Via Pera  
 Background 1-hour CO Concentration (ppm): 3.0  
 Background 8-hour CO Concentration (ppm): 1.5  
 Persistence Factor: 0.8  
 Analysis Year: 2030

## Roadway Data

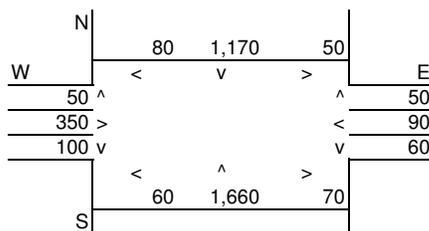
Intersection: Lake Forest & Toledo  
 Analysis Condition: Year 2030 Traffic Volumes - Landowner Concept Plan

	Roadway Type	No. of Lanes	Average Speed		
			A.M.	P.M.	
North-South Roadway:	Lake Forest	At Grade	8	20	20
East-West Roadway:	Toledo	At Grade	6	20	20

### A.M. Peak Hour Traffic Volumes



### P.M. Peak Hour Traffic Volumes



### Highest Traffic Volumes (Vehicles per Hour)

N-S Road:	3,020	N-S Road:	3,120
E-W Road:	750	E-W Road:	730

## Roadway CO Contributions and Concentrations

Emissions = (A x B x C) / 100,000<sup>1</sup>

Roadway	A <sub>1</sub>	A <sub>2</sub>	A <sub>3</sub>	B	C	Estimated CO Concentrations		
	Reference CO Concentrations 25 Feet	50 Feet	100 Feet	Traffic Volume	Emission Factors <sup>2</sup>	25 Feet	50 Feet	100 Feet
<b>A.M. Peak Traffic Hour</b>								
North-South Road	5.7	4.6	3.4	3,020	1.09	0.19	0.15	0.11
East-West Road	2.3	2.0	1.7	750	1.09	0.02	0.02	0.01
<b>P.M. Peak Traffic Hour</b>								
North-South Road	5.7	4.6	3.4	3,120	1.09	0.19	0.16	0.12
East-West Road	2.3	2.0	1.7	730	1.09	0.02	0.02	0.01

<sup>1</sup> Methodology from Bay Area Air Quality Management District *BAAQMD CEQA Guidelines* (1996).

<sup>2</sup> Emission factors from EMFAC2002 (2003).

## Total Roadway CO Concentrations

Peak Hour Emissions = North-South Concentration + East-West Concentration + Background 1-hour Concentration<sup>2</sup>

8-Hour Emissions = ((Highest Peak Hour Concentration - Background 1-hour Concentration) x Persistence Factor) + Background 8-hour Concentration

	A.M. Peak Hour	P.M. Peak Hour	8-Hour
25 Feet from Roadway Edge	3.2	3.2	1.7
50 Feet from Roadway Edge	3.2	3.2	1.6
100 Feet from Roadway Edge	3.1	3.1	1.6

<sup>2</sup> Methodology from Bay Area Air Quality Management District *BAAQMD CEQA Guidelines* (1996).

# SIMPLIFIED CALINE4 CARBON MONOXIDE ANALYSIS

**Project Number:** 10953-00  
**Project Title:** City of Lake Forest Opportunities Study Program EIR

## Background Information

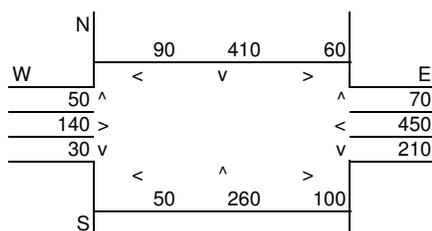
Nearest Air Monitoring Station measuring CO: Mission Viejo - 26081 Via Pera  
 Background 1-hour CO Concentration (ppm): 3.0  
 Background 8-hour CO Concentration (ppm): 1.5  
 Persistence Factor: 0.8  
 Analysis Year: 2030

## Roadway Data

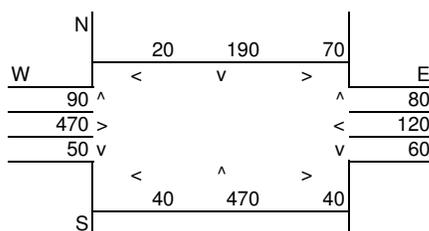
Intersection: Ridge Route & Toledo  
 Analysis Condition: Year 2030 Traffic Volumes - Landowner Concept Plan

	Roadway Type	No. of Lanes	Average Speed		
			A.M.	P.M.	
North-South Roadway:	Ridge Route	At Grade	6	20	20
East-West Roadway:	Toledo	At Grade	6	20	20

### A.M. Peak Hour Traffic Volumes



### P.M. Peak Hour Traffic Volumes



### Highest Traffic Volumes (Vehicles per Hour)

N-S Road:	1,060	N-S Road:	920
E-W Road:	1,030	E-W Road:	840

## Roadway CO Contributions and Concentrations

Emissions = (A x B x C) / 100,000<sup>1</sup>

Roadway	A <sub>1</sub>	A <sub>2</sub>	A <sub>3</sub>	B	C	Estimated CO Concentrations		
	Reference CO Concentrations 25 Feet	50 Feet	100 Feet	Traffic Volume	Emission Factors <sup>2</sup>	25 Feet	50 Feet	100 Feet
<b>A.M. Peak Traffic Hour</b>								
North-South Road	6.1	4.9	3.5	1,060	1.09	0.07	0.06	0.04
East-West Road	2.3	2.0	1.7	1,030	1.09	0.03	0.02	0.02
<b>P.M. Peak Traffic Hour</b>								
North-South Road	6.1	4.9	3.5	920	1.09	0.06	0.05	0.04
East-West Road	2.3	2.0	1.7	840	1.09	0.02	0.02	0.02

<sup>1</sup> Methodology from Bay Area Air Quality Management District *BAAQMD CEQA Guidelines* (1996).

<sup>2</sup> Emission factors from EMFAC2002 (2003).

## Total Roadway CO Concentrations

Peak Hour Emissions = North-South Concentration + East-West Concentration + Background 1-hour Concentration<sup>2</sup>

8-Hour Emissions = ((Highest Peak Hour Concentration - Background 1-hour Concentration) x Persistence Factor) + Background 8-hour Concentration

	A.M. Peak Hour	P.M. Peak Hour	8-Hour
25 Feet from Roadway Edge	3.1	3.1	1.6
50 Feet from Roadway Edge	3.1	3.1	1.6
100 Feet from Roadway Edge	3.1	3.1	1.5

<sup>2</sup> Methodology from Bay Area Air Quality Management District *BAAQMD CEQA Guidelines* (1996).

# SIMPLIFIED CALINE4 CARBON MONOXIDE ANALYSIS

Project Number: 10953-00  
 Project Title: City of Lake Forest Opportunities Study Program EIR

## Background Information

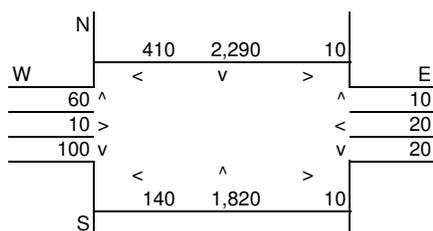
Nearest Air Monitoring Station measuring CO: Mission Viejo - 26081 Via Pera  
 Background 1-hour CO Concentration (ppm): 3.0  
 Background 8-hour CO Concentration (ppm): 1.5  
 Persistence Factor: 0.8  
 Analysis Year: 2030

## Roadway Data

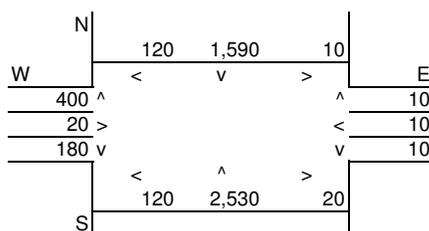
Intersection: El Toro & Toledo  
 Analysis Condition: Year 2030 Traffic Volumes - Landowner Concept Plan

	Roadway Type	No. of Lanes	Average Speed		
			A.M.	P.M.	
North-South Roadway:	El Toro	At Grade	8	20	20
East-West Roadway:	Toledo	At Grade	4	20	20

### A.M. Peak Hour Traffic Volumes



### P.M. Peak Hour Traffic Volumes



### Highest Traffic Volumes (Vehicles per Hour)

N-S Road:	4,600	N-S Road:	4,660
E-W Road:	740	E-W Road:	850

## Roadway CO Contributions and Concentrations

$$\text{Emissions} = (A \times B \times C) / 100,000^1$$

Roadway	A <sub>1</sub>	A <sub>2</sub>	A <sub>3</sub>	B	C	Estimated CO Concentrations		
	Reference CO Concentrations 25 Feet	50 Feet	100 Feet	Traffic Volume	Emission Factors <sup>2</sup>	25 Feet	50 Feet	100 Feet
<b>A.M. Peak Traffic Hour</b>								
North-South Road	5.7	4.6	3.4	4,600	1.09	0.29	0.23	0.17
East-West Road	2.6	2.2	1.7	740	1.09	0.02	0.02	0.01
<b>P.M. Peak Traffic Hour</b>								
North-South Road	5.7	4.6	3.4	4,660	1.09	0.29	0.23	0.17
East-West Road	2.6	2.2	1.7	850	1.09	0.02	0.02	0.02

<sup>1</sup> Methodology from Bay Area Air Quality Management District *BAAQMD CEQA Guidelines* (1996).

<sup>2</sup> Emission factors from EMFAC2002 (2003).

## Total Roadway CO Concentrations

$$\text{Peak Hour Emissions} = \text{North-South Concentration} + \text{East-West Concentration} + \text{Background 1-hour Concentration}^2$$

$$\text{8-Hour Emissions} = ((\text{Highest Peak Hour Concentration} - \text{Background 1-hour Concentration}) \times \text{Persistence Factor}) + \text{Background 8-hour Concentration}$$

	A.M. Peak Hour	P.M. Peak Hour	8-Hour
25 Feet from Roadway Edge	3.3	3.3	1.8
50 Feet from Roadway Edge	3.2	3.3	1.7
100 Feet from Roadway Edge	3.2	3.2	1.7

<sup>2</sup> Methodology from Bay Area Air Quality Management District *BAAQMD CEQA Guidelines* (1996).

# SIMPLIFIED CALINE4 CARBON MONOXIDE ANALYSIS

Project Number: 10953-00  
 Project Title: City of Lake Forest Opportunities Study Program EIR

## Background Information

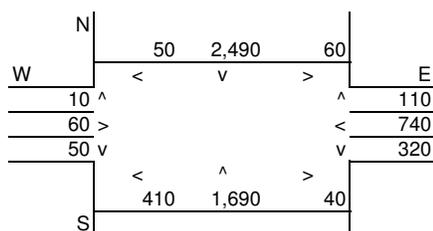
Nearest Air Monitoring Station measuring CO: Mission Viejo - 26081 Via Pera  
 Background 1-hour CO Concentration (ppm): 3.0  
 Background 8-hour CO Concentration (ppm): 1.5  
 Persistence Factor: 0.8  
 Analysis Year: 2030

## Roadway Data

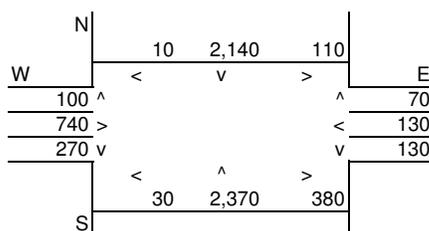
Intersection: Bake & Jeronimo  
 Analysis Condition: Year 2030 Traffic Volumes - Landowner Concept Plan

	Roadway Type	No. of Lanes	Average Speed		
			A.M.	P.M.	
North-South Roadway:	Bake	At Grade	8	5	15
East-West Roadway:	Jeronimo	At Grade	8	5	15

### A.M. Peak Hour Traffic Volumes



### P.M. Peak Hour Traffic Volumes



### Highest Traffic Volumes (Vehicles per Hour)

N-S Road:	5,000	N-S Road:	5,320
E-W Road:	1,330	E-W Road:	1,560

## Roadway CO Contributions and Concentrations

Emissions = (A x B x C) / 100,000<sup>1</sup>

Roadway	Reference CO Concentrations			B Traffic Volume	C Emission Factors <sup>2</sup>	Estimated CO Concentrations		
	A <sub>1</sub> 25 Feet	A <sub>2</sub> 50 Feet	A <sub>3</sub> 100 Feet			25 Feet	50 Feet	100 Feet
A.M. Peak Traffic Hour								
North-South Road	5.7	4.6	3.4	5,000	1.65	0.47	0.38	0.28
East-West Road	2.2	1.9	1.6	1,330	1.65	0.05	0.04	0.04
P.M. Peak Traffic Hour								
North-South Road	5.7	4.6	3.4	5,320	1.23	0.37	0.30	0.22
East-West Road	2.2	1.9	1.6	1,560	1.23	0.04	0.04	0.03

<sup>1</sup> Methodology from Bay Area Air Quality Management District *BAAQMD CEQA Guidelines* (1996).

<sup>2</sup> Emission factors from EMFAC2002 (2003).

## Total Roadway CO Concentrations

Peak Hour Emissions = North-South Concentration + East-West Concentration + Background 1-hour Concentration<sup>2</sup>

8-Hour Emissions = ((Highest Peak Hour Concentration - Background 1-hour Concentration) x Persistence Factor) + Background 8-hour Concentration

	A.M. Peak Hour	P.M. Peak Hour	8-Hour
25 Feet from Roadway Edge	3.5	3.4	1.9
50 Feet from Roadway Edge	3.4	3.3	1.8
100 Feet from Roadway Edge	3.3	3.3	1.8

<sup>2</sup> Methodology from Bay Area Air Quality Management District *BAAQMD CEQA Guidelines* (1996).

# SIMPLIFIED CALINE4 CARBON MONOXIDE ANALYSIS

Project Number: 10953-00  
 Project Title: City of Lake Forest Opportunities Study Program EIR

## Background Information

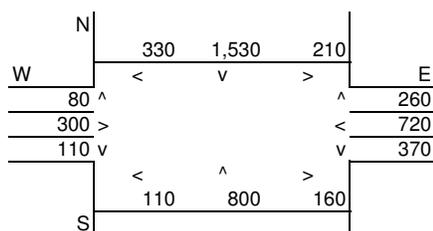
Nearest Air Monitoring Station measuring CO: Mission Viejo - 26081 Via Pera  
 Background 1-hour CO Concentration (ppm): 3.0  
 Background 8-hour CO Concentration (ppm): 1.5  
 Persistence Factor: 0.8  
 Analysis Year: 2030

## Roadway Data

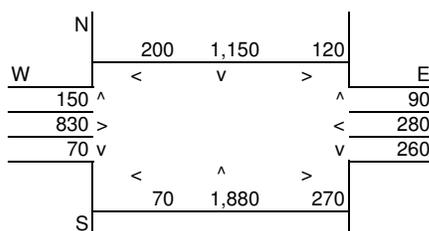
Intersection: Lake Forest & Jeronimo  
 Analysis Condition: Year 2030 Traffic Volumes - Landowner Concept Plan

	Roadway Type	No. of Lanes	Average Speed		
			A.M.	P.M.	
North-South Roadway:	Lake Forest	At Grade	8	20	15
East-West Roadway:	Jeronimo	At Grade	6	20	15

### A.M. Peak Hour Traffic Volumes



### P.M. Peak Hour Traffic Volumes



### Highest Traffic Volumes (Vehicles per Hour)

N-S Road: 3,210                      N-S Road: 3,700  
 E-W Road: 2,020                      E-W Road: 1,850

## Roadway CO Contributions and Concentrations

$$\text{Emissions} = (A \times B \times C) / 100,000^1$$

Roadway	A <sub>1</sub>	A <sub>2</sub>	A <sub>3</sub>	B	C	Estimated CO Concentrations		
	Reference CO Concentrations 25 Feet	50 Feet	100 Feet	Traffic Volume	Emission Factors <sup>2</sup>	25 Feet	50 Feet	100 Feet
A.M. Peak Traffic Hour								
North-South Road	5.7	4.6	3.4	3,210	1.09	0.20	0.16	0.12
East-West Road	2.3	2.0	1.7	2,020	1.09	0.05	0.04	0.04
P.M. Peak Traffic Hour								
North-South Road	5.7	4.6	3.4	3,700	1.23	0.26	0.21	0.15
East-West Road	2.3	2.0	1.7	1,850	1.23	0.05	0.05	0.04

<sup>1</sup> Methodology from Bay Area Air Quality Management District *BAAQMD CEQA Guidelines* (1996).

<sup>2</sup> Emission factors from EMFAC2002 (2003).

## Total Roadway CO Concentrations

$$\text{Peak Hour Emissions} = \text{North-South Concentration} + \text{East-West Concentration} + \text{Background 1-hour Concentration}^2$$

$$\text{8-Hour Emissions} = ((\text{Highest Peak Hour Concentration} - \text{Background 1-hour Concentration}) \times \text{Persistence Factor}) + \text{Background 8-hour Concentration}$$

	A.M. Peak Hour	P.M. Peak Hour	8-Hour
25 Feet from Roadway Edge	3.3	3.3	1.7
50 Feet from Roadway Edge	3.2	3.3	1.7
100 Feet from Roadway Edge	3.2	3.2	1.7

<sup>2</sup> Methodology from Bay Area Air Quality Management District *BAAQMD CEQA Guidelines* (1996).

# SIMPLIFIED CALINE4 CARBON MONOXIDE ANALYSIS

**Project Number:** 10953-00  
**Project Title:** City of Lake Forest Opportunities Study Program EIR

## Background Information

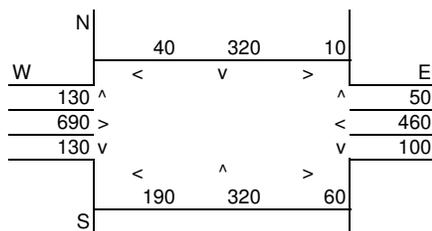
Nearest Air Monitoring Station measuring CO: Mission Viejo - 26081 Via Pera  
 Background 1-hour CO Concentration (ppm): 3.0  
 Background 8-hour CO Concentration (ppm): 1.5  
 Persistence Factor: 0.8  
 Analysis Year: 2030

## Roadway Data

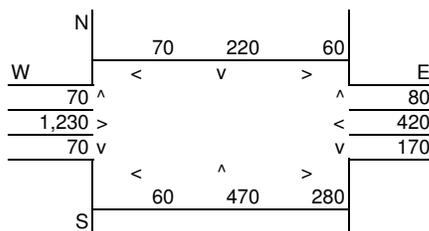
Intersection: Ridge Route & Jeronimo  
 Analysis Condition: Year 2030 Traffic Volumes - Landowner Concept Plan

	Roadway Type	No. of Lanes	Average Speed		
			A.M.	P.M.	
North-South Roadway:	Ridge Route	At Grade	8	20	20
East-West Roadway:	Jeronimo	At Grade	6	20	20

### A.M. Peak Hour Traffic Volumes



### P.M. Peak Hour Traffic Volumes



### Highest Traffic Volumes (Vehicles per Hour)

A.M. Peak Hour:  
 N-S Road: 1,120  
 E-W Road: 1,640

P.M. Peak Hour:  
 N-S Road: 1,270  
 E-W Road: 2,240

## Roadway CO Contributions and Concentrations

$$\text{Emissions} = (A \times B \times C) / 100,000^1$$

Roadway	A <sub>1</sub>	A <sub>2</sub>	A <sub>3</sub>	B	C	Estimated CO Concentrations		
	Reference CO Concentrations 25 Feet	50 Feet	100 Feet	Traffic Volume	Emission Factors <sup>2</sup>	25 Feet	50 Feet	100 Feet
<b>A.M. Peak Traffic Hour</b>								
North-South Road	2.2	1.9	1.6	1,120	1.09	0.03	0.02	0.02
East-West Road	6.1	4.9	3.5	1,640	1.09	0.11	0.09	0.06
<b>P.M. Peak Traffic Hour</b>								
North-South Road	2.2	1.9	1.6	1,270	1.09	0.03	0.03	0.02
East-West Road	6.1	4.9	3.5	2,240	1.09	0.15	0.12	0.09

<sup>1</sup> Methodology from Bay Area Air Quality Management District *BAAQMD CEQA Guidelines* (1996).

<sup>2</sup> Emission factors from EMFAC2002 (2003).

## Total Roadway CO Concentrations

$$\text{Peak Hour Emissions} = \text{North-South Concentration} + \text{East-West Concentration} + \text{Background 1-hour Concentration}^2$$

$$\text{8-Hour Emissions} = ((\text{Highest Peak Hour Concentration} - \text{Background 1-hour Concentration}) \times \text{Persistence Factor}) + \text{Background 8-hour Concentration}$$

	A.M. Peak Hour	P.M. Peak Hour	8-Hour
25 Feet from Roadway Edge	3.1	3.2	1.6
50 Feet from Roadway Edge	3.1	3.1	1.6
100 Feet from Roadway Edge	3.1	3.1	1.6

<sup>2</sup> Methodology from Bay Area Air Quality Management District *BAAQMD CEQA Guidelines* (1996).

# SIMPLIFIED CALINE4 CARBON MONOXIDE ANALYSIS

**Project Number:** 10953-00  
**Project Title:** City of Lake Forest Opportunities Study Program EIR

## Background Information

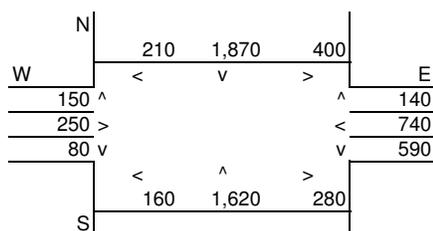
Nearest Air Monitoring Station measuring CO: Mission Viejo - 26081 Via Pera  
 Background 1-hour CO Concentration (ppm): 3.0  
 Background 8-hour CO Concentration (ppm): 1.5  
 Persistence Factor: 0.8  
 Analysis Year: 2030

## Roadway Data

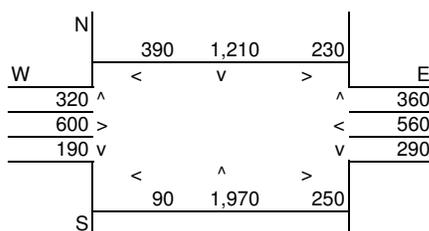
Intersection: El Toro & Jeronimo  
 Analysis Condition: Year 2030 Traffic Volumes - Landowner Concept Plan

	Roadway Type	No. of Lanes	Average Speed		
			A.M.	P.M.	
North-South Roadway:	El Toro	At Grade	8	10	10
East-West Roadway:	Jeronimo	At Grade	8	10	10

### A.M. Peak Hour Traffic Volumes



### P.M. Peak Hour Traffic Volumes



### Highest Traffic Volumes (Vehicles per Hour)

N-S Road: 4,600                      N-S Road: 4,480  
 E-W Road: 2,400                      E-W Road: 2,290

## Roadway CO Contributions and Concentrations

Emissions = (A x B x C) / 100,000<sup>1</sup>

Roadway	A <sub>1</sub>	A <sub>2</sub>	A <sub>3</sub>	B	C	Estimated CO Concentrations		
	Reference CO Concentrations 25 Feet	50 Feet	100 Feet	Traffic Volume	Emission Factors <sup>2</sup>	25 Feet	50 Feet	100 Feet
<b>A.M. Peak Traffic Hour</b>								
North-South Road	5.7	4.6	3.4	4,600	1.41	0.37	0.30	0.22
East-West Road	2.2	1.9	1.6	2,400	1.41	0.07	0.06	0.05
<b>P.M. Peak Traffic Hour</b>								
North-South Road	5.7	4.6	3.4	4,480	1.41	0.36	0.29	0.21
East-West Road	2.2	1.9	1.6	2,290	1.41	0.07	0.06	0.05

<sup>1</sup> Methodology from Bay Area Air Quality Management District *BAAQMD CEQA Guidelines* (1996).

<sup>2</sup> Emission factors from EMFAC2002 (2003).

## Total Roadway CO Concentrations

Peak Hour Emissions = North-South Concentration + East-West Concentration + Background 1-hour Concentration<sup>2</sup>

8-Hour Emissions = ((Highest Peak Hour Concentration - Background 1-hour Concentration) x Persistence Factor) + Background 8-hour Concentration

	A.M. Peak Hour	P.M. Peak Hour	8-Hour
25 Feet from Roadway Edge	3.4	3.4	1.9
50 Feet from Roadway Edge	3.4	3.4	1.8
100 Feet from Roadway Edge	3.3	3.3	1.7

<sup>2</sup> Methodology from Bay Area Air Quality Management District *BAAQMD CEQA Guidelines* (1996).

# SIMPLIFIED CALINE4 CARBON MONOXIDE ANALYSIS

**Project Number:** 10953-00  
**Project Title:** City of Lake Forest Opportunities Study Program EIR

## Background Information

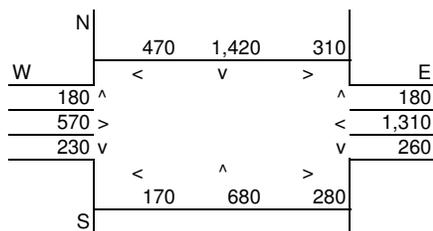
Nearest Air Monitoring Station measuring CO: Mission Viejo - 26081 Via Pera  
 Background 1-hour CO Concentration (ppm): 3.0  
 Background 8-hour CO Concentration (ppm): 1.5  
 Persistence Factor: 0.8  
 Analysis Year: 2030

## Roadway Data

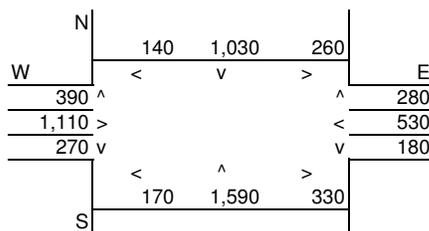
Intersection: Los Alisos & Jeronimo  
 Analysis Condition: Year 2030 Traffic Volumes - Landowner Concept Plan

	Roadway Type	No. of Lanes	Average Speed		
			A.M.	P.M.	
North-South Roadway:	Los Alisos	At Grade	8	10	10
East-West Roadway:	Jeronimo	At Grade	8	10	10

### A.M. Peak Hour Traffic Volumes



### P.M. Peak Hour Traffic Volumes



### Highest Traffic Volumes (Vehicles per Hour)

N-S Road: 3,240                      N-S Road: 3,690  
 E-W Road: 2,930                      E-W Road: 2,690

## Roadway CO Contributions and Concentrations

Emissions = (A x B x C) / 100,000<sup>1</sup>

Roadway	A <sub>1</sub>	A <sub>2</sub>	A <sub>3</sub>	B	C	Estimated CO Concentrations		
	Reference CO Concentrations 25 Feet	50 Feet	100 Feet	Traffic Volume	Emission Factors <sup>2</sup>	25 Feet	50 Feet	100 Feet
<b>A.M. Peak Traffic Hour</b>								
North-South Road	5.7	4.6	3.4	3,240	1.41	0.26	0.21	0.16
East-West Road	2.2	1.9	1.6	2,930	1.41	0.09	0.08	0.07
<b>P.M. Peak Traffic Hour</b>								
North-South Road	5.7	4.6	3.4	3,690	1.41	0.30	0.24	0.18
East-West Road	2.2	1.9	1.6	2,690	1.41	0.08	0.07	0.06

<sup>1</sup> Methodology from Bay Area Air Quality Management District *BAAQMD CEQA Guidelines* (1996).

<sup>2</sup> Emission factors from EMFAC2002 (2003).

## Total Roadway CO Concentrations

Peak Hour Emissions = North-South Concentration + East-West Concentration + Background 1-hour Concentration<sup>2</sup>

8-Hour Emissions = ((Highest Peak Hour Concentration - Background 1-hour Concentration) x Persistence Factor) + Background 8-hour Concentration

	A.M. Peak Hour	P.M. Peak Hour	8-Hour
25 Feet from Roadway Edge	3.4	3.4	1.8
50 Feet from Roadway Edge	3.3	3.3	1.7
100 Feet from Roadway Edge	3.2	3.2	1.7

<sup>2</sup> Methodology from Bay Area Air Quality Management District *BAAQMD CEQA Guidelines* (1996).

# SIMPLIFIED CALINE4 CARBON MONOXIDE ANALYSIS

**Project Number:** 10953-00  
**Project Title:** City of Lake Forest Opportunities Study Program EIR

## Background Information

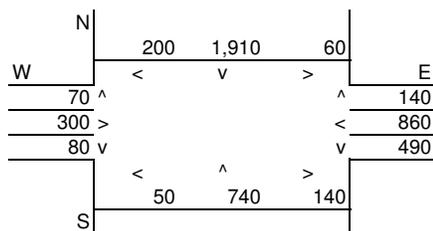
Nearest Air Monitoring Station measuring CO: Mission Viejo - 26081 Via Pera  
 Background 1-hour CO Concentration (ppm): 3.0  
 Background 8-hour CO Concentration (ppm): 1.5  
 Persistence Factor: 0.8  
 Analysis Year: 2030

## Roadway Data

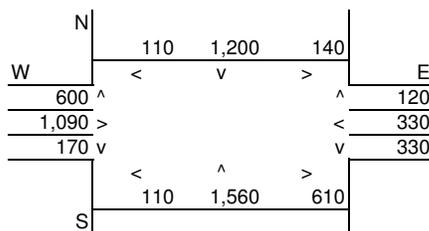
Intersection: Lake Forest & Muirlands  
 Analysis Condition: Year 2030 Traffic Volumes - Landowner Concept Plan

	Roadway Type	No. of Lanes	Average Speed		
			A.M.	P.M.	
North-South Roadway:	Lake Forest	At Grade	8	20	15
East-West Roadway:	Muirlands	At Grade	8	20	15

### A.M. Peak Hour Traffic Volumes



### P.M. Peak Hour Traffic Volumes



### Highest Traffic Volumes (Vehicles per Hour)

N-S Road:	3,410	N-S Road:	3,980
E-W Road:	1,990	E-W Road:	2,620

## Roadway CO Contributions and Concentrations

$$\text{Emissions} = (A \times B \times C) / 100,000^1$$

Roadway	A <sub>1</sub>	A <sub>2</sub>	A <sub>3</sub>	B	C	Estimated CO Concentrations		
	Reference CO Concentrations 25 Feet	50 Feet	100 Feet	Traffic Volume	Emission Factors <sup>2</sup>	25 Feet	50 Feet	100 Feet
<b>A.M. Peak Traffic Hour</b>								
North-South Road	5.7	4.6	3.4	3,410	1.09	0.21	0.17	0.13
East-West Road	2.2	1.9	1.6	1,990	1.09	0.05	0.04	0.03
<b>P.M. Peak Traffic Hour</b>								
North-South Road	5.7	4.6	3.4	3,980	1.23	0.28	0.23	0.17
East-West Road	2.2	1.9	1.6	2,620	1.23	0.07	0.06	0.05

<sup>1</sup> Methodology from Bay Area Air Quality Management District *BAAQMD CEQA Guidelines* (1996).

<sup>2</sup> Emission factors from EMFAC2002 (2003).

## Total Roadway CO Concentrations

$$\text{Peak Hour Emissions} = \text{North-South Concentration} + \text{East-West Concentration} + \text{Background 1-hour Concentration}^2$$

$$\text{8-Hour Emissions} = ((\text{Highest Peak Hour Concentration} - \text{Background 1-hour Concentration}) \times \text{Persistence Factor}) + \text{Background 8-hour Concentration}$$

	A.M. Peak Hour	P.M. Peak Hour	8-Hour
25 Feet from Roadway Edge	3.3	3.3	1.8
50 Feet from Roadway Edge	3.2	3.3	1.7
100 Feet from Roadway Edge	3.2	3.2	1.7

<sup>2</sup> Methodology from Bay Area Air Quality Management District *BAAQMD CEQA Guidelines* (1996).

# SIMPLIFIED CALINE4 CARBON MONOXIDE ANALYSIS

**Project Number:** 10953-00  
**Project Title:** City of Lake Forest Opportunities Study Program EIR

## Background Information

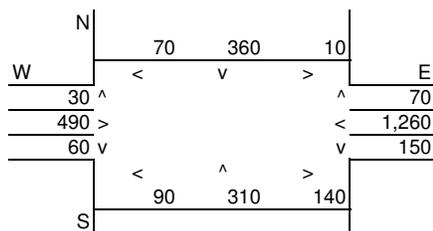
Nearest Air Monitoring Station measuring CO: Mission Viejo - 26081 Via Pera  
 Background 1-hour CO Concentration (ppm): 3.0  
 Background 8-hour CO Concentration (ppm): 1.5  
 Persistence Factor: 0.8  
 Analysis Year: 2030

## Roadway Data

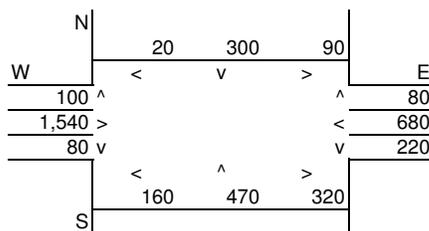
Intersection: Ridge Route & Muirlands  
 Analysis Condition: Year 2030 Traffic Volumes - Landowner Concept Plan

	Roadway Type	No. of Lanes	Average Speed		
			A.M.	P.M.	
North-South Roadway:	Ridge Route	At Grade	8	20	15
East-West Roadway:	Muirlands	At Grade	8	20	15

### A.M. Peak Hour Traffic Volumes



### P.M. Peak Hour Traffic Volumes



### Highest Traffic Volumes (Vehicles per Hour)

N-S Road: 1,110                      N-S Road: 1,550  
 E-W Road: 2,120                      E-W Road: 2,930

## Roadway CO Contributions and Concentrations

Emissions = (A x B x C) / 100,000<sup>1</sup>

Roadway	A <sub>1</sub>	A <sub>2</sub>	A <sub>3</sub>	B	C	Estimated CO Concentrations		
	Reference CO Concentrations 25 Feet	50 Feet	100 Feet	Traffic Volume	Emission Factors <sup>2</sup>	25 Feet	50 Feet	100 Feet
<b>A.M. Peak Traffic Hour</b>								
North-South Road	2.2	1.9	1.6	1,110	1.09	0.03	0.02	0.02
East-West Road	5.7	4.6	3.4	2,120	1.09	0.13	0.11	0.08
<b>P.M. Peak Traffic Hour</b>								
North-South Road	2.2	1.9	1.6	1,550	1.23	0.04	0.04	0.03
East-West Road	5.7	4.6	3.4	2,930	1.23	0.21	0.17	0.12

<sup>1</sup> Methodology from Bay Area Air Quality Management District *BAAQMD CEQA Guidelines* (1996).

<sup>2</sup> Emission factors from EMFAC2002 (2003).

## Total Roadway CO Concentrations

Peak Hour Emissions = North-South Concentration + East-West Concentration + Background 1-hour Concentration<sup>2</sup>

8-Hour Emissions = ((Highest Peak Hour Concentration - Background 1-hour Concentration) x Persistence Factor) + Background 8-hour Concentration

	A.M. Peak Hour	P.M. Peak Hour	8-Hour
25 Feet from Roadway Edge	3.2	3.2	1.7
50 Feet from Roadway Edge	3.1	3.2	1.7
100 Feet from Roadway Edge	3.1	3.2	1.6

<sup>2</sup> Methodology from Bay Area Air Quality Management District *BAAQMD CEQA Guidelines* (1996).

# SIMPLIFIED CALINE4 CARBON MONOXIDE ANALYSIS

Project Number: 10953-00  
 Project Title: City of Lake Forest Opportunities Study Program EIR

## Background Information

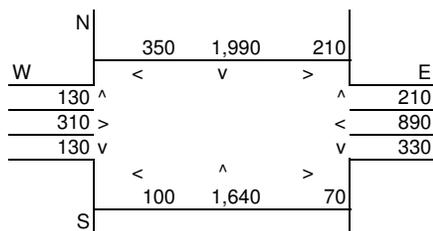
Nearest Air Monitoring Station measuring CO: Mission Viejo - 26081 Via Pera  
 Background 1-hour CO Concentration (ppm): 3.0  
 Background 8-hour CO Concentration (ppm): 1.5  
 Persistence Factor: 0.8  
 Analysis Year: 2030

## Roadway Data

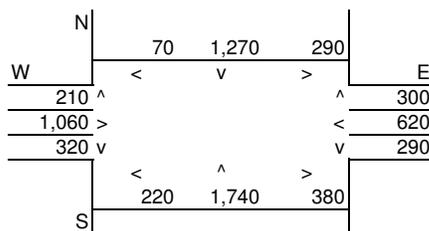
Intersection: El Toro & Muirlands  
 Analysis Condition: Year 2030 Traffic Volumes - Landowner Concept Plan

	Roadway Type	No. of Lanes	Average Speed		
			A.M.	P.M.	
North-South Roadway:	El Toro	At Grade	8	20	15
East-West Roadway:	Muirlands	At Grade	8	20	15

### A.M. Peak Hour Traffic Volumes



### P.M. Peak Hour Traffic Volumes



### Highest Traffic Volumes (Vehicles per Hour)

N-S Road: 4,530  
 E-W Road: 2,020  
 N-S Road: 4,220  
 E-W Road: 2,940

## Roadway CO Contributions and Concentrations

$$\text{Emissions} = (A \times B \times C) / 100,000^1$$

Roadway	A <sub>1</sub>	A <sub>2</sub>	A <sub>3</sub>	B	C	Estimated CO Concentrations		
	Reference CO Concentrations 25 Feet	50 Feet	100 Feet	Traffic Volume	Emission Factors <sup>2</sup>	25 Feet	50 Feet	100 Feet
A.M. Peak Traffic Hour								
North-South Road	5.7	4.6	3.4	4,530	1.09	0.28	0.23	0.17
East-West Road	2.2	1.9	1.6	2,020	1.09	0.05	0.04	0.04
P.M. Peak Traffic Hour								
North-South Road	5.7	4.6	3.4	4,220	1.23	0.30	0.24	0.18
East-West Road	2.2	1.9	1.6	2,940	1.23	0.08	0.07	0.06

<sup>1</sup> Methodology from Bay Area Air Quality Management District *BAAQMD CEQA Guidelines* (1996).

<sup>2</sup> Emission factors from EMFAC2002 (2003).

## Total Roadway CO Concentrations

$$\text{Peak Hour Emissions} = \text{North-South Concentration} + \text{East-West Concentration} + \text{Background 1-hour Concentration}^2$$

$$\text{8-Hour Emissions} = ((\text{Highest Peak Hour Concentration} - \text{Background 1-hour Concentration}) \times \text{Persistence Factor}) + \text{Background 8-hour Concentration}$$

	A.M. Peak Hour	P.M. Peak Hour	8-Hour
25 Feet from Roadway Edge	3.3	3.4	1.8
50 Feet from Roadway Edge	3.3	3.3	1.7
100 Feet from Roadway Edge	3.2	3.2	1.7

<sup>2</sup> Methodology from Bay Area Air Quality Management District *BAAQMD CEQA Guidelines* (1996).

# SIMPLIFIED CALINE4 CARBON MONOXIDE ANALYSIS

**Project Number:** 10953-00  
**Project Title:** City of Lake Forest Opportunities Study Program EIR

## Background Information

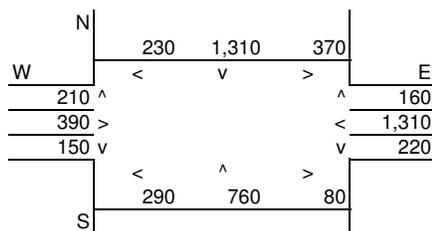
Nearest Air Monitoring Station measuring CO: Mission Viejo - 26081 Via Pera  
 Background 1-hour CO Concentration (ppm): 3.0  
 Background 8-hour CO Concentration (ppm): 1.5  
 Persistence Factor: 0.8  
 Analysis Year: 2030

## Roadway Data

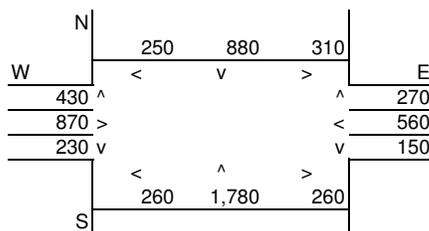
Intersection: Los Alisos & Muirlands  
 Analysis Condition: Year 2030 Traffic Volumes - Landowner Concept Plan

	Roadway Type	No. of Lanes	Average Speed		
			A.M.	P.M.	
North-South Roadway:	Los Alisos	At Grade	8	5	5
East-West Roadway:	Muirlands	At Grade	6	5	5

### A.M. Peak Hour Traffic Volumes



### P.M. Peak Hour Traffic Volumes



### Highest Traffic Volumes (Vehicles per Hour)

N-S Road: 3,040                      N-S Road: 3,920  
 E-W Road: 2,580                      E-W Road: 2,600

## Roadway CO Contributions and Concentrations

Emissions = (A x B x C) / 100,000<sup>1</sup>

Roadway	A <sub>1</sub>	A <sub>2</sub>	A <sub>3</sub>	B	C	Estimated CO Concentrations		
	Reference CO Concentrations 25 Feet	50 Feet	100 Feet	Traffic Volume	Emission Factors <sup>2</sup>	25 Feet	50 Feet	100 Feet
<b>A.M. Peak Traffic Hour</b>								
North-South Road	5.7	4.6	3.4	3,040	1.65	0.29	0.23	0.17
East-West Road	2.3	2.0	1.7	2,580	1.65	0.10	0.09	0.07
<b>P.M. Peak Traffic Hour</b>								
North-South Road	5.7	4.6	3.4	3,920	1.65	0.37	0.30	0.22
East-West Road	2.3	2.0	1.7	2,600	1.65	0.10	0.09	0.07

<sup>1</sup> Methodology from Bay Area Air Quality Management District *BAAQMD CEQA Guidelines* (1996).

<sup>2</sup> Emission factors from EMFAC2002 (2003).

## Total Roadway CO Concentrations

Peak Hour Emissions = North-South Concentration + East-West Concentration + Background 1-hour Concentration<sup>2</sup>

8-Hour Emissions = ((Highest Peak Hour Concentration - Background 1-hour Concentration) x Persistence Factor) + Background 8-hour Concentration

	A.M. Peak Hour	P.M. Peak Hour	8-Hour
25 Feet from Roadway Edge	3.4	3.5	1.9
50 Feet from Roadway Edge	3.3	3.4	1.8
100 Feet from Roadway Edge	3.2	3.3	1.7

<sup>2</sup> Methodology from Bay Area Air Quality Management District *BAAQMD CEQA Guidelines* (1996).

# SIMPLIFIED CALINE4 CARBON MONOXIDE ANALYSIS

Project Number: 10953-00  
 Project Title: City of Lake Forest Opportunities Study Program EIR

## Background Information

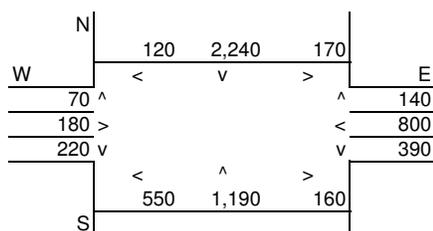
Nearest Air Monitoring Station measuring CO: Mission Viejo - 26081 Via Pera  
 Background 1-hour CO Concentration (ppm): 3.0  
 Background 8-hour CO Concentration (ppm): 1.5  
 Persistence Factor: 0.8  
 Analysis Year: 2030

## Roadway Data

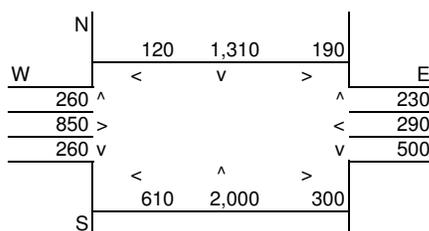
Intersection: Lake Forest & Rockfield  
 Analysis Condition: Year 2030 Traffic Volumes - Landowner Concept Plan

	Roadway Type	No. of Lanes	Average Speed		
			A.M.	P.M.	
North-South Roadway:	Lake Forest	At Grade	8	15	15
East-West Roadway:	Rockfield	At Grade	8	15	15

### A.M. Peak Hour Traffic Volumes



### P.M. Peak Hour Traffic Volumes



### Highest Traffic Volumes (Vehicles per Hour)

N-S Road: 4,750  
 E-W Road: 1,940

N-S Road: 4,980  
 E-W Road: 2,390

## Roadway CO Contributions and Concentrations

$$\text{Emissions} = (A \times B \times C) / 100,000^1$$

Roadway	A <sub>1</sub>	A <sub>2</sub>	A <sub>3</sub>	B	C	Estimated CO Concentrations		
	Reference CO Concentrations 25 Feet	50 Feet	100 Feet	Traffic Volume	Emission Factors <sup>2</sup>	25 Feet	50 Feet	100 Feet
A.M. Peak Traffic Hour								
North-South Road	5.7	4.6	3.4	4,750	1.23	0.33	0.27	0.20
East-West Road	2.2	1.9	1.6	1,940	1.23	0.05	0.05	0.04
P.M. Peak Traffic Hour								
North-South Road	5.7	4.6	3.4	4,980	1.23	0.35	0.28	0.21
East-West Road	2.2	1.9	1.6	2,390	1.23	0.06	0.06	0.05

<sup>1</sup> Methodology from Bay Area Air Quality Management District *BAAQMD CEQA Guidelines* (1996).

<sup>2</sup> Emission factors from EMFAC2002 (2003).

## Total Roadway CO Concentrations

$$\text{Peak Hour Emissions} = \text{North-South Concentration} + \text{East-West Concentration} + \text{Background 1-hour Concentration}^2$$

$$\text{8-Hour Emissions} = ((\text{Highest Peak Hour Concentration} - \text{Background 1-hour Concentration}) \times \text{Persistence Factor}) + \text{Background 8-hour Concentration}$$

	A.M. Peak Hour	P.M. Peak Hour	8-Hour
25 Feet from Roadway Edge	3.4	3.4	1.8
50 Feet from Roadway Edge	3.3	3.3	1.8
100 Feet from Roadway Edge	3.2	3.3	1.7

<sup>2</sup> Methodology from Bay Area Air Quality Management District *BAAQMD CEQA Guidelines* (1996).

# SIMPLIFIED CALINE4 CARBON MONOXIDE ANALYSIS

Project Number: 10953-00  
 Project Title: City of Lake Forest Opportunities Study Program EIR

## Background Information

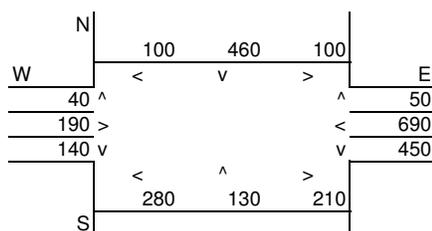
Nearest Air Monitoring Station measuring CO: Mission Viejo - 26081 Via Pera  
 Background 1-hour CO Concentration (ppm): 3.0  
 Background 8-hour CO Concentration (ppm): 1.5  
 Persistence Factor: 0.8  
 Analysis Year: 2030

## Roadway Data

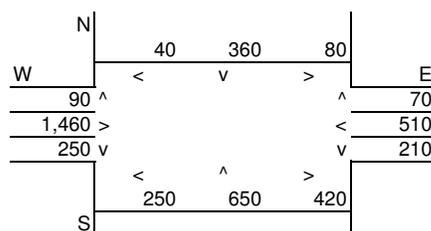
Intersection: Ridge Route & Rockfield  
 Analysis Condition: Year 2030 Traffic Volumes - Landowner Concept Plan

	Roadway Type	No. of Lanes	Average Speed		
			A.M.	P.M.	
North-South Roadway:	Ridge Route	At Grade	4	20	5
East-West Roadway:	Rockfield	At Grade	6	20	5

### A.M. Peak Hour Traffic Volumes



### P.M. Peak Hour Traffic Volumes



### Highest Traffic Volumes (Vehicles per Hour)

N-S Road: 1,670                      N-S Road: 2,140  
 E-W Road: 1,690                      E-W Road: 2,750

## Roadway CO Contributions and Concentrations

Emissions = (A x B x C) / 100,000<sup>1</sup>

Roadway	A <sub>1</sub>	A <sub>2</sub>	A <sub>3</sub>	B	C	Estimated CO Concentrations		
	Reference CO Concentrations 25 Feet	50 Feet	100 Feet	Traffic Volume	Emission Factors <sup>2</sup>	25 Feet	50 Feet	100 Feet
A.M. Peak Traffic Hour								
North-South Road	2.6	2.2	1.7	1,670	1.09	0.05	0.04	0.03
East-West Road	6.1	4.9	3.5	1,690	1.09	0.11	0.09	0.06
P.M. Peak Traffic Hour								
North-South Road	2.6	2.2	1.7	2,140	1.65	0.09	0.08	0.06
East-West Road	6.1	4.9	3.5	2,750	1.65	0.28	0.22	0.16

<sup>1</sup> Methodology from Bay Area Air Quality Management District *BAAQMD CEQA Guidelines* (1996).

<sup>2</sup> Emission factors from EMFAC2002 (2003).

## Total Roadway CO Concentrations

Peak Hour Emissions = North-South Concentration + East-West Concentration + Background 1-hour Concentration<sup>2</sup>

8-Hour Emissions = ((Highest Peak Hour Concentration - Background 1-hour Concentration) x Persistence Factor) + Background 8-hour Concentration

	A.M. Peak Hour	P.M. Peak Hour	8-Hour
25 Feet from Roadway Edge	3.2	3.4	1.8
50 Feet from Roadway Edge	3.1	3.3	1.7
100 Feet from Roadway Edge	3.1	3.2	1.7

<sup>2</sup> Methodology from Bay Area Air Quality Management District *BAAQMD CEQA Guidelines* (1996).

# SIMPLIFIED CALINE4 CARBON MONOXIDE ANALYSIS

Project Number: 10953-00  
 Project Title: City of Lake Forest Opportunities Study Program EIR

## Background Information

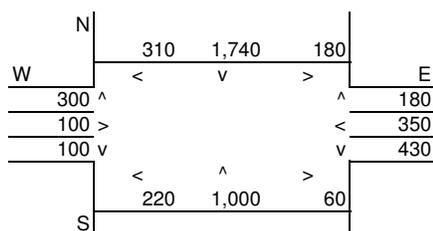
Nearest Air Monitoring Station measuring CO: Mission Viejo - 26081 Via Pera  
 Background 1-hour CO Concentration (ppm): 3.0  
 Background 8-hour CO Concentration (ppm): 1.5  
 Persistence Factor: 0.8  
 Analysis Year: 2030

## Roadway Data

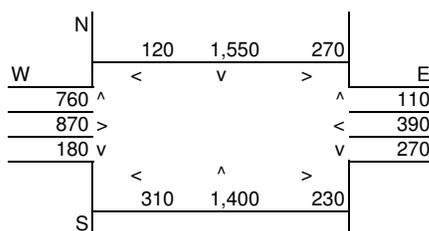
Intersection: El Toro & Rockfield  
 Analysis Condition: Year 2030 Traffic Volumes - Landowner Concept Plan

	Roadway Type	No. of Lanes	Average Speed		
			A.M.	P.M.	
North-South Roadway:	El Toro	At Grade	8	20	20
East-West Roadway:	Rockfield	At Grade	8	20	20

### A.M. Peak Hour Traffic Volumes



### P.M. Peak Hour Traffic Volumes



### Highest Traffic Volumes (Vehicles per Hour)

N-S Road: 3,710                      N-S Road: 4,210  
 E-W Road: 1,380                    E-W Road: 2,630

## Roadway CO Contributions and Concentrations

$$\text{Emissions} = (A \times B \times C) / 100,000^1$$

Roadway	Reference CO Concentrations			B Traffic Volume	C Emission Factors <sup>2</sup>	Estimated CO Concentrations		
	A <sub>1</sub> 25 Feet	A <sub>2</sub> 50 Feet	A <sub>3</sub> 100 Feet			25 Feet	50 Feet	100 Feet
A.M. Peak Traffic Hour								
North-South Road	5.7	4.6	3.4	3,710	1.09	0.23	0.19	0.14
East-West Road	2.2	1.9	1.6	1,380	1.09	0.03	0.03	0.02
P.M. Peak Traffic Hour								
North-South Road	5.7	4.6	3.4	4,210	1.09	0.26	0.21	0.16
East-West Road	2.2	1.9	1.6	2,630	1.09	0.06	0.05	0.05

<sup>1</sup> Methodology from Bay Area Air Quality Management District *BAAQMD CEQA Guidelines* (1996).

<sup>2</sup> Emission factors from EMFAC2002 (2003).

## Total Roadway CO Concentrations

$$\text{Peak Hour Emissions} = \text{North-South Concentration} + \text{East-West Concentration} + \text{Background 1-hour Concentration}^2$$

$$\text{8-Hour Emissions} = ((\text{Highest Peak Hour Concentration} - \text{Background 1-hour Concentration}) \times \text{Persistence Factor}) + \text{Background 8-hour Concentration}$$

	A.M. Peak Hour	P.M. Peak Hour	8-Hour
25 Feet from Roadway Edge	3.3	3.3	1.8
50 Feet from Roadway Edge	3.2	3.3	1.7
100 Feet from Roadway Edge	3.2	3.2	1.7

<sup>2</sup> Methodology from Bay Area Air Quality Management District *BAAQMD CEQA Guidelines* (1996).

# SIMPLIFIED CALINE4 CARBON MONOXIDE ANALYSIS

**Project Number:** 10953-00  
**Project Title:** City of Lake Forest Opportunities Study Program EIR

## Background Information

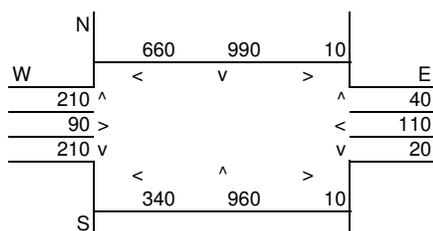
Nearest Air Monitoring Station measuring CO: Mission Viejo - 26081 Via Pera  
 Background 1-hour CO Concentration (ppm): 3.0  
 Background 8-hour CO Concentration (ppm): 1.5  
 Persistence Factor: 0.8  
 Analysis Year: 2030

## Roadway Data

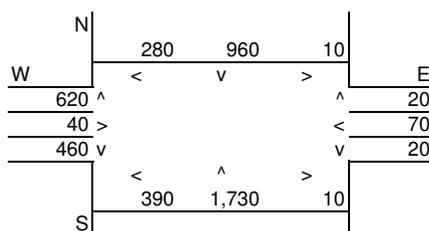
Intersection: Los Alisos & Rockfield  
 Analysis Condition: Year 2030 Traffic Volumes - Landowner Concept Plan

	Roadway Type	No. of Lanes	Average Speed		
			A.M.	P.M.	
North-South Roadway:	Los Alisos	At Grade	6	10	15
East-West Roadway:	Rockfield	At Grade	6	10	15

### A.M. Peak Hour Traffic Volumes



### P.M. Peak Hour Traffic Volumes



### Highest Traffic Volumes (Vehicles per Hour)

N-S Road: 2,870  
 E-W Road: 1,620

N-S Road: 3,620  
 E-W Road: 1,860

## Roadway CO Contributions and Concentrations

$$\text{Emissions} = (A \times B \times C) / 100,000^1$$

Roadway	A <sub>1</sub>	A <sub>2</sub>	A <sub>3</sub>	B	C	Estimated CO Concentrations		
	Reference CO Concentrations 25 Feet	50 Feet	100 Feet	Traffic Volume	Emission Factors <sup>2</sup>	25 Feet	50 Feet	100 Feet
<b>A.M. Peak Traffic Hour</b>								
North-South Road	6.1	4.9	3.5	2,870	1.41	0.25	0.20	0.14
East-West Road	2.3	2.0	1.7	1,620	1.41	0.05	0.05	0.04
<b>P.M. Peak Traffic Hour</b>								
North-South Road	6.1	4.9	3.5	3,620	1.23	0.27	0.22	0.16
East-West Road	2.3	2.0	1.7	1,860	1.23	0.05	0.05	0.04

<sup>1</sup> Methodology from Bay Area Air Quality Management District *BAAQMD CEQA Guidelines* (1996).

<sup>2</sup> Emission factors from EMFAC2002 (2003).

## Total Roadway CO Concentrations

$$\text{Peak Hour Emissions} = \text{North-South Concentration} + \text{East-West Concentration} + \text{Background 1-hour Concentration}^2$$

$$\text{8-Hour Emissions} = ((\text{Highest Peak Hour Concentration} - \text{Background 1-hour Concentration}) \times \text{Persistence Factor}) + \text{Background 8-hour Concentration}$$

	A.M. Peak Hour	P.M. Peak Hour	8-Hour
25 Feet from Roadway Edge	3.3	3.3	1.8
50 Feet from Roadway Edge	3.2	3.3	1.7
100 Feet from Roadway Edge	3.2	3.2	1.7

<sup>2</sup> Methodology from Bay Area Air Quality Management District *BAAQMD CEQA Guidelines* (1996).

# SIMPLIFIED CALINE4 CARBON MONOXIDE ANALYSIS

Project Number: 10953-00  
 Project Title: City of Lake Forest Opportunities Study Program EIR

## Background Information

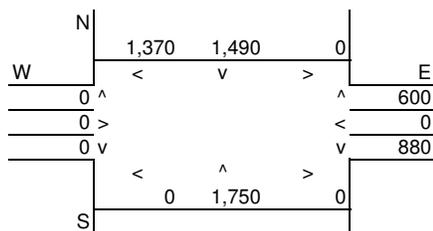
Nearest Air Monitoring Station measuring CO: Mission Viejo - 26081 Via Pera  
 Background 1-hour CO Concentration (ppm): 3.0  
 Background 8-hour CO Concentration (ppm): 1.5  
 Persistence Factor: 0.8  
 Analysis Year: 2030

## Roadway Data

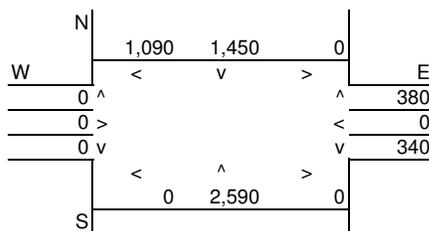
Intersection: Lake Forest & I-5 NB  
 Analysis Condition: Year 2030 Traffic Volumes - Proposed Project

	Roadway Type	No. of Lanes	Average Speed		
			A.M.	P.M.	
North-South Roadway:	Lake Forest	At Grade	6	20	20
East-West Roadway:	I-5 NB	At Grade	4	20	20

### A.M. Peak Hour Traffic Volumes



### P.M. Peak Hour Traffic Volumes



### Highest Traffic Volumes (Vehicles per Hour)

N-S Road: 5,210	N-S Road: 5,510
E-W Road: 1,480	E-W Road: 1,090

## Roadway CO Contributions and Concentrations

Emissions = (A x B x C) / 100,000<sup>1</sup>

Roadway	A <sub>1</sub>	A <sub>2</sub>	A <sub>3</sub>	B	C	Estimated CO Concentrations		
	Reference CO Concentrations 25 Feet	50 Feet	100 Feet	Traffic Volume	Emission Factors <sup>2</sup>	25 Feet	50 Feet	100 Feet
<b>A.M. Peak Traffic Hour</b>								
North-South Road	6.1	4.9	3.5	5,210	1.09	0.35	0.28	0.20
East-West Road	2.6	2.2	1.7	1,480	1.09	0.04	0.04	0.03
<b>P.M. Peak Traffic Hour</b>								
North-South Road	6.1	4.9	3.5	5,510	1.09	0.37	0.29	0.21
East-West Road	2.6	2.2	1.7	1,090	1.09	0.03	0.03	0.02

<sup>1</sup> Methodology from Bay Area Air Quality Management District *BAAQMD CEQA Guidelines* (1996).

<sup>2</sup> Emission factors from EMFAC2002 (2003).

## Total Roadway CO Concentrations

Peak Hour Emissions = North-South Concentration + East-West Concentration + Background 1-hour Concentration<sup>2</sup>

8-Hour Emissions = ((Highest Peak Hour Concentration - Background 1-hour Concentration) x Persistence Factor) + Background 8-hour Concentration

	A.M. Peak Hour	P.M. Peak Hour	8-Hour
25 Feet from Roadway Edge	3.4	3.4	1.8
50 Feet from Roadway Edge	3.3	3.3	1.8
100 Feet from Roadway Edge	3.2	3.2	1.7

<sup>2</sup> Methodology from Bay Area Air Quality Management District *BAAQMD CEQA Guidelines* (1996).

# SIMPLIFIED CALINE4 CARBON MONOXIDE ANALYSIS

**Project Number:** 10953-00  
**Project Title:** City of Lake Forest Opportunities Study Program EIR

## Background Information

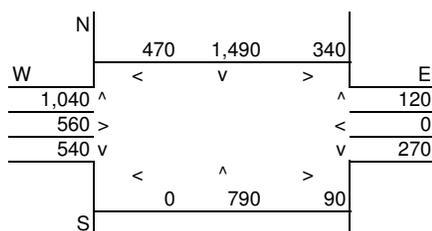
Nearest Air Monitoring Station measuring CO: Mission Viejo - 26081 Via Pera  
 Background 1-hour CO Concentration (ppm): 3.0  
 Background 8-hour CO Concentration (ppm): 1.5  
 Persistence Factor: 0.8  
 Analysis Year: 2030

## Roadway Data

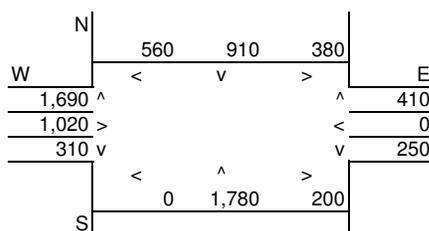
Intersection: Lake Forest & I-5 Carlota  
 Analysis Condition: Year 2030 Traffic Volumes - Landowner Concept Plan

	Roadway Type	No. of Lanes	Average Speed		
			A.M.	P.M.	
North-South Roadway:	Lake Forest	At Grade	8	15	10
East-West Roadway:	I-5 Carlota	At Grade	8	15	10

### A.M. Peak Hour Traffic Volumes



### P.M. Peak Hour Traffic Volumes



### Highest Traffic Volumes (Vehicles per Hour)

N-S Road: 4,250                      N-S Road: 5,730  
 E-W Road: 2,610                      E-W Road: 3,580

## Roadway CO Contributions and Concentrations

Emissions = (A x B x C) / 100,000<sup>1</sup>

Roadway	A <sub>1</sub>	A <sub>2</sub>	A <sub>3</sub>	B	C	Estimated CO Concentrations		
	Reference CO Concentrations 25 Feet	50 Feet	100 Feet	Traffic Volume	Emission Factors <sup>2</sup>	25 Feet	50 Feet	100 Feet
<b>A.M. Peak Traffic Hour</b>								
North-South Road	5.7	4.6	3.4	4,250	1.23	0.30	0.24	0.18
East-West Road	2.2	1.9	1.6	2,610	1.23	0.07	0.06	0.05
<b>P.M. Peak Traffic Hour</b>								
North-South Road	5.7	4.6	3.4	5,730	1.41	0.46	0.37	0.27
East-West Road	2.2	1.9	1.6	3,580	1.41	0.11	0.10	0.08

<sup>1</sup> Methodology from Bay Area Air Quality Management District *BAAQMD CEQA Guidelines* (1996).

<sup>2</sup> Emission factors from EMFAC2002 (2003).

## Total Roadway CO Concentrations

Peak Hour Emissions = North-South Concentration + East-West Concentration + Background 1-hour Concentration<sup>2</sup>

8-Hour Emissions = ((Highest Peak Hour Concentration - Background 1-hour Concentration) x Persistence Factor) + Background 8-hour Concentration

	A.M. Peak Hour	P.M. Peak Hour	8-Hour
25 Feet from Roadway Edge	3.4	3.6	2.0
50 Feet from Roadway Edge	3.3	3.5	1.9
100 Feet from Roadway Edge	3.2	3.4	1.8

<sup>2</sup> Methodology from Bay Area Air Quality Management District *BAAQMD CEQA Guidelines* (1996).



# SIMPLIFIED CALINE4 CARBON MONOXIDE ANALYSIS

**Project Number:** 10953-00  
**Project Title:** City of Lake Forest Opportunities Study Program EIR

## Background Information

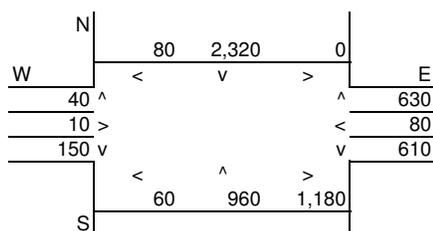
Nearest Air Monitoring Station measuring CO: Mission Viejo - 26081 Via Pera  
 Background 1-hour CO Concentration (ppm): 3.0  
 Background 8-hour CO Concentration (ppm): 1.5  
 Persistence Factor: 0.8  
 Analysis Year: 2030

## Roadway Data

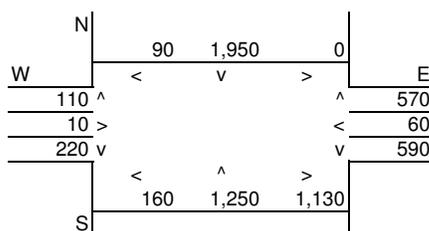
Intersection: El Toro & Bridger I-5 NB  
 Analysis Condition: Year 2030 Traffic Volumes - Landowner Concept Plan

	Roadway Type	No. of Lanes	Average Speed		
			A.M.	P.M.	
North-South Roadway:	El Toro	At Grade	8	20	20
East-West Roadway:	Bridger I-5 NB	At Grade	6	20	20

### A.M. Peak Hour Traffic Volumes



### P.M. Peak Hour Traffic Volumes



### Highest Traffic Volumes (Vehicles per Hour)

N-S Road: 5,280                      N-S Road: 5,300  
 E-W Road: 2,510                      E-W Road: 2,360

## Roadway CO Contributions and Concentrations

$$\text{Emissions} = (A \times B \times C) / 100,000^1$$

Roadway	A <sub>1</sub>	A <sub>2</sub>	A <sub>3</sub>	B	C	Estimated CO Concentrations		
	Reference CO Concentrations 25 Feet	50 Feet	100 Feet	Traffic Volume	Emission Factors <sup>2</sup>	25 Feet	50 Feet	100 Feet
<b>A.M. Peak Traffic Hour</b>								
North-South Road	5.7	4.6	3.4	5,280	1.09	0.33	0.26	0.20
East-West Road	2.3	2.0	1.7	2,510	1.09	0.06	0.05	0.05
<b>P.M. Peak Traffic Hour</b>								
North-South Road	5.7	4.6	3.4	5,300	1.09	0.33	0.27	0.20
East-West Road	2.3	2.0	1.7	2,360	1.09	0.06	0.05	0.04

<sup>1</sup> Methodology from Bay Area Air Quality Management District *BAAQMD CEQA Guidelines* (1996).

<sup>2</sup> Emission factors from EMFAC2002 (2003).

## Total Roadway CO Concentrations

$$\text{Peak Hour Emissions} = \text{North-South Concentration} + \text{East-West Concentration} + \text{Background 1-hour Concentration}^2$$

$$\text{8-Hour Emissions} = ((\text{Highest Peak Hour Concentration} - \text{Background 1-hour Concentration}) \times \text{Persistence Factor}) + \text{Background 8-hour Concentration}$$

	A.M. Peak Hour	P.M. Peak Hour	8-Hour
25 Feet from Roadway Edge	3.4	3.4	1.8
50 Feet from Roadway Edge	3.3	3.3	1.8
100 Feet from Roadway Edge	3.2	3.2	1.7

<sup>2</sup> Methodology from Bay Area Air Quality Management District *BAAQMD CEQA Guidelines* (1996).





# SIMPLIFIED CALINE4 CARBON MONOXIDE ANALYSIS

**Project Number:** 10953-00  
**Project Title:** City of Lake Forest Opportunities Study Program EIR

## Background Information

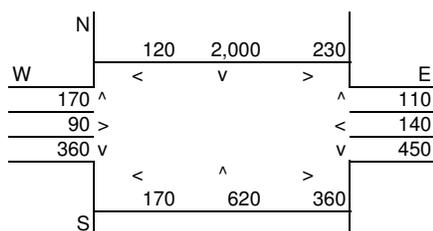
Nearest Air Monitoring Station measuring CO: Mission Viejo - 26081 Via Pera  
 Background 1-hour CO Concentration (ppm): 3.0  
 Background 8-hour CO Concentration (ppm): 1.5  
 Persistence Factor: 0.8  
 Analysis Year: 2030

## Roadway Data

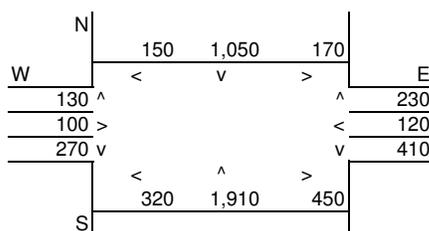
Intersection: Alton & Towne Centre Dr.  
 Analysis Condition: Year 2030 Traffic Volumes - Landowner Concept Plan

	Roadway Type	No. of Lanes	Average Speed		
			A.M.	P.M.	
North-South Roadway:	Alton	At Grade	8	10	20
East-West Roadway:	Towne Centre Dr.	At Grade	6	10	20

### A.M. Peak Hour Traffic Volumes



### P.M. Peak Hour Traffic Volumes



### Highest Traffic Volumes (Vehicles per Hour)

N-S Road: 3,960  
 E-W Road: 1,380  
 N-S Road: 4,410  
 E-W Road: 1,480

## Roadway CO Contributions and Concentrations

$$\text{Emissions} = (A \times B \times C) / 100,000^1$$

Roadway	A <sub>1</sub>	A <sub>2</sub>	A <sub>3</sub>	B	C	Estimated CO Concentrations		
	Reference CO Concentrations 25 Feet	50 Feet	100 Feet	Traffic Volume	Emission Factors <sup>2</sup>	25 Feet	50 Feet	100 Feet
<b>A.M. Peak Traffic Hour</b>								
North-South Road	5.7	4.6	3.4	3,960	1.41	0.32	0.26	0.19
East-West Road	2.3	2.0	1.7	1,380	1.41	0.04	0.04	0.03
<b>P.M. Peak Traffic Hour</b>								
North-South Road	5.7	4.6	3.4	4,410	1.09	0.27	0.22	0.16
East-West Road	2.3	2.0	1.7	1,480	1.09	0.04	0.03	0.03

<sup>1</sup> Methodology from Bay Area Air Quality Management District *BAAQMD CEQA Guidelines* (1996).

<sup>2</sup> Emission factors from EMFAC2002 (2003).

## Total Roadway CO Concentrations

$$\text{Peak Hour Emissions} = \text{North-South Concentration} + \text{East-West Concentration} + \text{Background 1-hour Concentration}^2$$

$$\text{8-Hour Emissions} = ((\text{Highest Peak Hour Concentration} - \text{Background 1-hour Concentration}) \times \text{Persistence Factor}) + \text{Background 8-hour Concentration}$$

	A.M. Peak Hour	P.M. Peak Hour	8-Hour
25 Feet from Roadway Edge	3.4	3.3	1.8
50 Feet from Roadway Edge	3.3	3.3	1.7
100 Feet from Roadway Edge	3.2	3.2	1.7

<sup>2</sup> Methodology from Bay Area Air Quality Management District *BAAQMD CEQA Guidelines* (1996).

# SIMPLIFIED CALINE4 CARBON MONOXIDE ANALYSIS

**Project Number:** 10953-00  
**Project Title:** City of Lake Forest Opportunities Study Program EIR

## Background Information

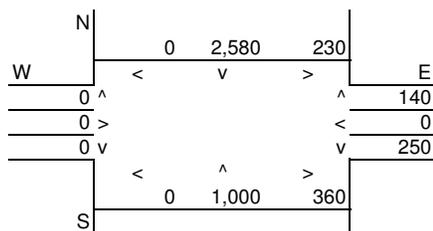
Nearest Air Monitoring Station measuring CO: Mission Viejo - 26081 Via Pera  
 Background 1-hour CO Concentration (ppm): 3.0  
 Background 8-hour CO Concentration (ppm): 1.5  
 Persistence Factor: 0.8  
 Analysis Year: 2030

## Roadway Data

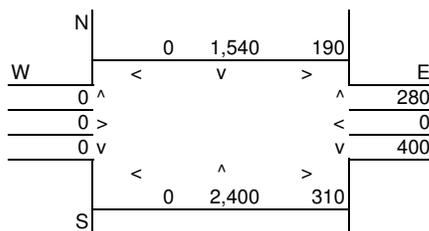
Intersection: Alton & Commercentre  
 Analysis Condition: Year 2030 Traffic Volumes - Landowner Concept Plan

	Roadway Type	No. of Lanes	Average Speed		
			A.M.	P.M.	
North-South Roadway:	Alton	At Grade	8	20	20
East-West Roadway:	Commercentre	At Grade	4	20	20

### A.M. Peak Hour Traffic Volumes



### P.M. Peak Hour Traffic Volumes



### Highest Traffic Volumes (Vehicles per Hour)

N-S Road:	4,190	N-S Road:	4,650
E-W Road:	980	E-W Road:	1,180

## Roadway CO Contributions and Concentrations

$$\text{Emissions} = (A \times B \times C) / 100,000^1$$

Roadway	A <sub>1</sub>	A <sub>2</sub>	A <sub>3</sub>	B	C	Estimated CO Concentrations		
	Reference CO Concentrations 25 Feet	50 Feet	100 Feet	Traffic Volume	Emission Factors <sup>2</sup>	25 Feet	50 Feet	100 Feet
<b>A.M. Peak Traffic Hour</b>								
North-South Road	5.7	4.6	3.4	4,190	1.09	0.26	0.21	0.16
East-West Road	2.6	2.2	1.7	980	1.09	0.03	0.02	0.02
<b>P.M. Peak Traffic Hour</b>								
North-South Road	5.7	4.6	3.4	4,650	1.09	0.29	0.23	0.17
East-West Road	2.6	2.2	1.7	1,180	1.09	0.03	0.03	0.02

<sup>1</sup> Methodology from Bay Area Air Quality Management District *BAAQMD CEQA Guidelines* (1996).

<sup>2</sup> Emission factors from EMFAC2002 (2003).

## Total Roadway CO Concentrations

$$\text{Peak Hour Emissions} = \text{North-South Concentration} + \text{East-West Concentration} + \text{Background 1-hour Concentration}^2$$

$$\text{8-Hour Emissions} = ((\text{Highest Peak Hour Concentration} - \text{Background 1-hour Concentration}) \times \text{Persistence Factor}) + \text{Background 8-hour Concentration}$$

	A.M. Peak Hour	P.M. Peak Hour	8-Hour
25 Feet from Roadway Edge	3.3	3.3	1.8
50 Feet from Roadway Edge	3.2	3.3	1.7
100 Feet from Roadway Edge	3.2	3.2	1.7

<sup>2</sup> Methodology from Bay Area Air Quality Management District *BAAQMD CEQA Guidelines* (1996).

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**CO Analysis in Extended Study Area—Existing General Plan Build-out**

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# SIMPLIFIED CALINE4 CARBON MONOXIDE ANALYSIS

Project Number: 10953-00  
 Project Title: City of Lake Forest Opportunities Study Program EIR

## Background Information

Nearest Air Monitoring Station measuring CO: Mission Viejo - 26081 Via Pera  
 Background 1-hour CO Concentration (ppm): 3.0  
 Background 8-hour CO Concentration (ppm): 1.5  
 Persistence Factor: 0.8  
 Analysis Year: 2030

## Roadway Data

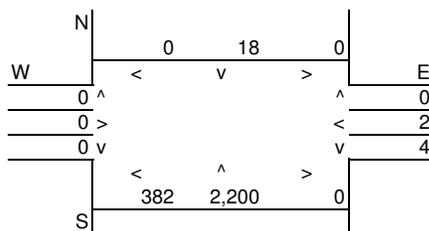
Intersection: Portola Pkwy at SR-241 NB Ramps  
 Analysis Condition: Year 2030 Traffic Volumes - Existing General Plan

	Roadway Type	No. of Lanes	Average Speed		
			A.M.	P.M.	
North-South Roadway:	Portola Pkwy	At Grade	6	20	20
East-West Roadway:	SR-241 NB Ramps	At Grade	2	20	20

### A.M. Peak Hour Traffic Volumes



### P.M. Peak Hour Traffic Volumes



### Highest Traffic Volumes (Vehicles per Hour)

N-S Road: 3,159  
 E-W Road: 551

N-S Road: 2,604  
 E-W Road: 384

## Roadway CO Contributions and Concentrations

$$\text{Emissions} = (A \times B \times C) / 100,000^1$$

Roadway	A <sub>1</sub>	A <sub>2</sub>	A <sub>3</sub>	B	C	Estimated CO Concentrations		
	Reference CO Concentrations 25 Feet	50 Feet	100 Feet	Traffic Volume	Emission Factors <sup>2</sup>	25 Feet	50 Feet	100 Feet
<b>A.M. Peak Traffic Hour</b>								
North-South Road	6.1	4.9	3.5	3,159	1.09	0.21	0.17	0.12
East-West Road	2.7	2.2	1.7	551	1.09	0.02	0.01	0.01
<b>P.M. Peak Traffic Hour</b>								
North-South Road	6.1	4.9	3.5	2,604	1.09	0.17	0.14	0.10
East-West Road	2.7	2.2	1.7	384	1.09	0.01	0.01	0.01

<sup>1</sup> Methodology from Bay Area Air Quality Management District *BAAQMD CEQA Guidelines* (1996).

<sup>2</sup> Emission factors from EMFAC2002 (2003).

## Total Roadway CO Concentrations

$$\text{Peak Hour Emissions} = \text{North-South Concentration} + \text{East-West Concentration} + \text{Background 1-hour Concentration}^2$$

$$\text{8-Hour Emissions} = ((\text{Highest Peak Hour Concentration} - \text{Background 1-hour Concentration}) \times \text{Persistence Factor}) + \text{Background 8-hour Concentration}$$

	A.M. Peak Hour	P.M. Peak Hour	8-Hour
25 Feet from Roadway Edge	3.2	3.2	1.7
50 Feet from Roadway Edge	3.2	3.1	1.6
100 Feet from Roadway Edge	3.1	3.1	1.6

<sup>2</sup> Methodology from Bay Area Air Quality Management District *BAAQMD CEQA Guidelines* (1996).

# SIMPLIFIED CALINE4 CARBON MONOXIDE ANALYSIS

Project Number: 10953-00  
 Project Title: City of Lake Forest Opportunities Study Program EIR

## Background Information

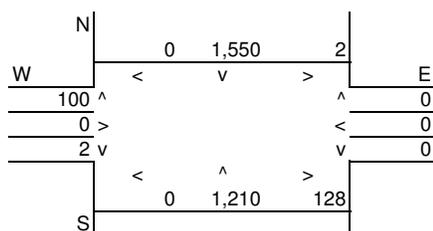
Nearest Air Monitoring Station measuring CO: Mission Viejo - 26081 Via Pera  
 Background 1-hour CO Concentration (ppm): 3.0  
 Background 8-hour CO Concentration (ppm): 1.5  
 Persistence Factor: 0.8  
 Analysis Year: 2030

## Roadway Data

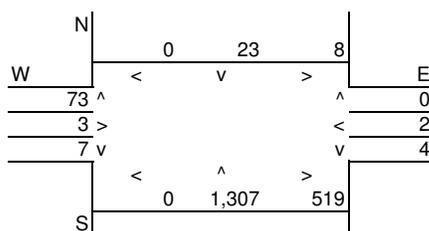
Intersection: Portola Pkwy at SR-241 SB Ramps  
 Analysis Condition: Year 2030 Traffic Volumes - Existing General Plan

	Roadway Type	No. of Lanes	Average Speed		
			A.M.	P.M.	
North-South Roadway:	Portola Pkwy	At Grade	6	20	20
East-West Roadway:	SR-241 SB Ramps	At Grade	2	20	20

### A.M. Peak Hour Traffic Volumes



### P.M. Peak Hour Traffic Volumes



### Highest Traffic Volumes (Vehicles per Hour)

N-S Road: 2,890  
 E-W Road: 130  
 N-S Road: 1,860  
 E-W Road: 536

## Roadway CO Contributions and Concentrations

$$\text{Emissions} = (A \times B \times C) / 100,000^1$$

Roadway	A <sub>1</sub>	A <sub>2</sub>	A <sub>3</sub>	B	C	Estimated CO Concentrations		
	Reference CO Concentrations 25 Feet	50 Feet	100 Feet	Traffic Volume	Emission Factors <sup>2</sup>	25 Feet	50 Feet	100 Feet
A.M. Peak Traffic Hour								
North-South Road	6.1	4.9	3.5	2,890	1.09	0.19	0.15	0.11
East-West Road	2.7	2.2	1.7	130	1.09	0.00	0.00	0.00
P.M. Peak Traffic Hour								
North-South Road	6.1	4.9	3.5	1,860	1.09	0.12	0.10	0.07
East-West Road	2.7	2.2	1.7	536	1.09	0.02	0.01	0.01

<sup>1</sup> Methodology from Bay Area Air Quality Management District *BAAQMD CEQA Guidelines* (1996).

<sup>2</sup> Emission factors from EMFAC2002 (2003).

## Total Roadway CO Concentrations

$$\text{Peak Hour Emissions} = \text{North-South Concentration} + \text{East-West Concentration} + \text{Background 1-hour Concentration}^2$$

$$\text{8-Hour Emissions} = ((\text{Highest Peak Hour Concentration} - \text{Background 1-hour Concentration}) \times \text{Persistence Factor}) + \text{Background 8-hour Concentration}$$

	A.M. Peak Hour	P.M. Peak Hour	8-Hour
25 Feet from Roadway Edge	3.2	3.1	1.7
50 Feet from Roadway Edge	3.2	3.1	1.6
100 Feet from Roadway Edge	3.1	3.1	1.6

<sup>2</sup> Methodology from Bay Area Air Quality Management District *BAAQMD CEQA Guidelines* (1996).

# SIMPLIFIED CALINE4 CARBON MONOXIDE ANALYSIS

Project Number: 10953-00  
 Project Title: City of Lake Forest Opportunities Study Program EIR

## Background Information

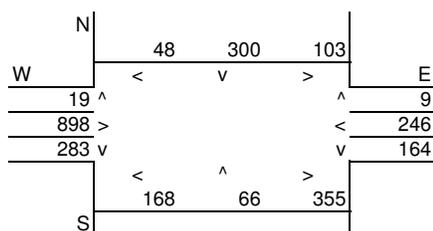
Nearest Air Monitoring Station measuring CO: Mission Viejo - 26081 Via Pera  
 Background 1-hour CO Concentration (ppm): 3.0  
 Background 8-hour CO Concentration (ppm): 1.5  
 Persistence Factor: 0.8  
 Analysis Year: 2030

## Roadway Data

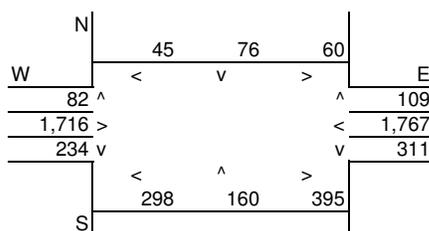
Intersection: Ridge Vly at Portola Pkwy  
 Analysis Condition: Year 2030 Traffic Volumes - Existing General Plan

	Roadway Type	No. of Lanes	Average Speed		
			A.M.	P.M.	
North-South Roadway:	Ridge Vly.	At Grade	8	20	15
East-West Roadway:	Portola Pkwy.	At Grade	8	20	15

### A.M. Peak Hour Traffic Volumes



### P.M. Peak Hour Traffic Volumes



### Highest Traffic Volumes (Vehicles per Hour)

N-S Road: 1,336                      N-S Road: 1,474  
 E-W Road: 1,775                      E-W Road: 4,358

## Roadway CO Contributions and Concentrations

$$\text{Emissions} = (A \times B \times C) / 100,000^1$$

Roadway	Reference CO Concentrations			B Traffic Volume	C Emission Factors <sup>2</sup>	Estimated CO Concentrations		
	A <sub>1</sub> 25 Feet	A <sub>2</sub> 50 Feet	A <sub>3</sub> 100 Feet			25 Feet	50 Feet	100 Feet
A.M. Peak Traffic Hour								
North-South Road	2.2	1.9	1.6	1,336	1.09	0.03	0.03	0.02
East-West Road	5.7	4.6	3.4	1,775	1.09	0.11	0.09	0.07
P.M. Peak Traffic Hour								
North-South Road	2.2	1.9	1.6	1,474	1.23	0.04	0.03	0.03
East-West Road	5.7	4.6	3.4	4,358	1.23	0.31	0.25	0.18

<sup>1</sup> Methodology from Bay Area Air Quality Management District *BAAQMD CEQA Guidelines* (1996).

<sup>2</sup> Emission factors from EMFAC2002 (2003).

## Total Roadway CO Concentrations

$$\text{Peak Hour Emissions} = \text{North-South Concentration} + \text{East-West Concentration} + \text{Background 1-hour Concentration}^2$$

$$\text{8-Hour Emissions} = ((\text{Highest Peak Hour Concentration} - \text{Background 1-hour Concentration}) \times \text{Persistence Factor}) + \text{Background 8-hour Concentration}$$

	A.M. Peak Hour	P.M. Peak Hour	8-Hour
25 Feet from Roadway Edge	3.1	3.3	1.8
50 Feet from Roadway Edge	3.1	3.3	1.7
100 Feet from Roadway Edge	3.1	3.2	1.7

<sup>2</sup> Methodology from Bay Area Air Quality Management District *BAAQMD CEQA Guidelines* (1996).

# SIMPLIFIED CALINE4 CARBON MONOXIDE ANALYSIS

Project Number: 10953-00  
 Project Title: City of Lake Forest Opportunities Study Program EIR

## Background Information

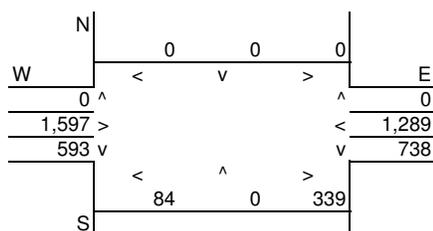
Nearest Air Monitoring Station measuring CO: Mission Viejo - 26081 Via Pera  
 Background 1-hour CO Concentration (ppm): 3.0  
 Background 8-hour CO Concentration (ppm): 1.5  
 Persistence Factor: 0.8  
 Analysis Year: 2030

## Roadway Data

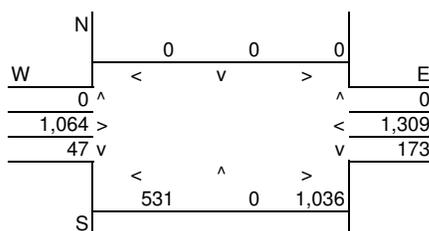
Intersection: Sand Cyn at Portola Pkwy  
 Analysis Condition: Year 2030 Traffic Volumes - Existing General Plan

	Roadway Type	No. of Lanes	Average Speed		
			A.M.	P.M.	
North-South Roadway:	Sand Cyn.	At Grade	4	20	20
East-West Roadway:	Portola Pkwy.	At Grade	6	20	20

### A.M. Peak Hour Traffic Volumes



### P.M. Peak Hour Traffic Volumes



### Highest Traffic Volumes (Vehicles per Hour)

N-S Road:	1,754	N-S Road:	1,787
E-W Road:	3,963	E-W Road:	3,582

## Roadway CO Contributions and Concentrations

Emissions = (A x B x C) / 100,000<sup>1</sup>

Roadway	A <sub>1</sub>	A <sub>2</sub>	A <sub>3</sub>	B	C	Estimated CO Concentrations		
	Reference CO Concentrations 25 Feet	50 Feet	100 Feet	Traffic Volume	Emission Factors <sup>2</sup>	25 Feet	50 Feet	100 Feet
<b>A.M. Peak Traffic Hour</b>								
North-South Road	2.6	2.2	1.7	1,754	1.09	0.05	0.04	0.03
East-West Road	6.1	4.9	3.5	3,963	1.09	0.26	0.21	0.15
<b>P.M. Peak Traffic Hour</b>								
North-South Road	2.6	2.2	1.7	1,787	1.09	0.05	0.04	0.03
East-West Road	6.1	4.9	3.5	3,582	1.09	0.24	0.19	0.14

<sup>1</sup> Methodology from Bay Area Air Quality Management District *BAAQMD CEQA Guidelines* (1996).

<sup>2</sup> Emission factors from EMFAC2002 (2003).

## Total Roadway CO Concentrations

Peak Hour Emissions = North-South Concentration + East-West Concentration + Background 1-hour Concentration<sup>2</sup>

8-Hour Emissions = ((Highest Peak Hour Concentration - Background 1-hour Concentration) x Persistence Factor) + Background 8-hour Concentration

	A.M. Peak Hour	P.M. Peak Hour	8-Hour
25 Feet from Roadway Edge	3.3	3.3	1.8
50 Feet from Roadway Edge	3.3	3.2	1.7
100 Feet from Roadway Edge	3.2	3.2	1.6

<sup>2</sup> Methodology from Bay Area Air Quality Management District *BAAQMD CEQA Guidelines* (1996).

# SIMPLIFIED CALINE4 CARBON MONOXIDE ANALYSIS

**Project Number:** 10953-00  
**Project Title:** City of Lake Forest Opportunities Study Program EIR

## Background Information

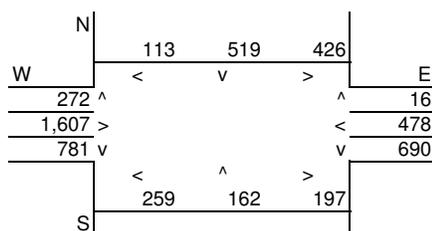
Nearest Air Monitoring Station measuring CO: Mission Viejo - 26081 Via Pera  
 Background 1-hour CO Concentration (ppm): 3.0  
 Background 8-hour CO Concentration (ppm): 1.5  
 Persistence Factor: 0.8  
 Analysis Year: 2030

## Roadway Data

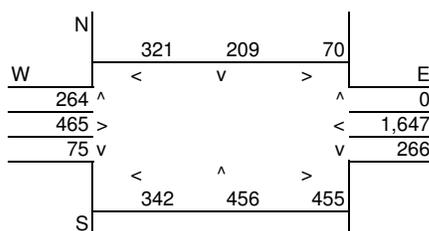
Intersection: Jeffrey Rd at Portola Pkwy  
 Analysis Condition: Year 2030 Traffic Volumes - Existing General Plan

	Roadway Type	No. of Lanes	Average Speed		
			A.M.	P.M.	
North-South Roadway:	Jerrey Rd.	At Grade	8	15	20
East-West Roadway:	Portola Pkwy.	At Grade	8	15	20

### A.M. Peak Hour Traffic Volumes



### P.M. Peak Hour Traffic Volumes



### Highest Traffic Volumes (Vehicles per Hour)

N-S Road: 2,608  
 E-W Road: 3,510  
 N-S Road: 1,803  
 E-W Road: 3,114

## Roadway CO Contributions and Concentrations

$$\text{Emissions} = (A \times B \times C) / 100,000^1$$

Roadway	A <sub>1</sub>	A <sub>2</sub>	A <sub>3</sub>	B	C	Estimated CO Concentrations		
	Reference CO Concentrations 25 Feet	50 Feet	100 Feet	Traffic Volume	Emission Factors <sup>2</sup>	25 Feet	50 Feet	100 Feet
<b>A.M. Peak Traffic Hour</b>								
North-South Road	2.2	1.9	1.6	2,608	1.23	0.07	0.06	0.05
East-West Road	5.7	4.6	3.4	3,510	1.23	0.25	0.20	0.15
<b>P.M. Peak Traffic Hour</b>								
North-South Road	2.2	1.9	1.6	1,803	1.09	0.04	0.04	0.03
East-West Road	5.7	4.6	3.4	3,114	1.09	0.19	0.16	0.12

<sup>1</sup> Methodology from Bay Area Air Quality Management District *BAAQMD CEQA Guidelines* (1996).

<sup>2</sup> Emission factors from EMFAC2002 (2003).

## Total Roadway CO Concentrations

$$\text{Peak Hour Emissions} = \text{North-South Concentration} + \text{East-West Concentration} + \text{Background 1-hour Concentration}^2$$

$$\text{8-Hour Emissions} = ((\text{Highest Peak Hour Concentration} - \text{Background 1-hour Concentration}) \times \text{Persistence Factor}) + \text{Background 8-hour Concentration}$$

	A.M. Peak Hour	P.M. Peak Hour	8-Hour
25 Feet from Roadway Edge	3.3	3.2	1.8
50 Feet from Roadway Edge	3.3	3.2	1.7
100 Feet from Roadway Edge	3.2	3.1	1.7

<sup>2</sup> Methodology from Bay Area Air Quality Management District *BAAQMD CEQA Guidelines* (1996).

# SIMPLIFIED CALINE4 CARBON MONOXIDE ANALYSIS

Project Number: 10953-00  
 Project Title: City of Lake Forest Opportunities Study Program EIR

## Background Information

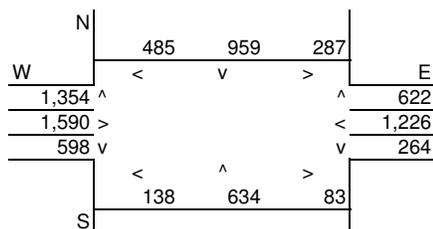
Nearest Air Monitoring Station measuring CO: Mission Viejo - 26081 Via Pera  
 Background 1-hour CO Concentration (ppm): 3.0  
 Background 8-hour CO Concentration (ppm): 1.5  
 Persistence Factor: 0.8  
 Analysis Year: 2030

## Roadway Data

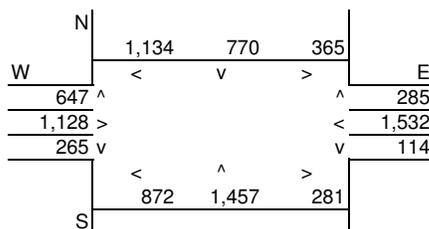
Intersection: Alton Pkwy at Irvine Bl  
 Analysis Condition: Year 2030 Traffic Volumes - Existing General Plan

	Roadway Type	No. of Lanes	Average Speed		
			A.M.	P.M.	
North-South Roadway:	Alton Pkwy	At Grade	8	10	10
East-West Roadway:	Irvine Bl	At Grade	8	10	10

### A.M. Peak Hour Traffic Volumes



### P.M. Peak Hour Traffic Volumes



### Highest Traffic Volumes (Vehicles per Hour)

N-S Road: 4,341                      N-S Road: 4,658  
 E-W Road: 5,391                      E-W Road: 5,578

## Roadway CO Contributions and Concentrations

Emissions = (A x B x C) / 100,000<sup>1</sup>

Roadway	A <sub>1</sub>	A <sub>2</sub>	A <sub>3</sub>	B	C	Estimated CO Concentrations		
	Reference CO Concentrations 25 Feet	50 Feet	100 Feet	Traffic Volume	Emission Factors <sup>2</sup>	25 Feet	50 Feet	100 Feet
<b>A.M. Peak Traffic Hour</b>								
North-South Road	2.2	1.9	1.6	4,341	1.41	0.13	0.12	0.10
East-West Road	5.7	4.6	3.4	5,391	1.41	0.43	0.35	0.26
<b>P.M. Peak Traffic Hour</b>								
North-South Road	2.2	1.9	1.6	4,658	1.41	0.14	0.12	0.11
East-West Road	5.7	4.6	3.4	5,578	1.41	0.45	0.36	0.27

<sup>1</sup> Methodology from Bay Area Air Quality Management District *BAAQMD CEQA Guidelines* (1996).

<sup>2</sup> Emission factors from EMFAC2002 (2003).

## Total Roadway CO Concentrations

Peak Hour Emissions = North-South Concentration + East-West Concentration + Background 1-hour Concentration<sup>2</sup>

8-Hour Emissions = ((Highest Peak Hour Concentration - Background 1-hour Concentration) x Persistence Factor) + Background 8-hour Concentration

	A.M. Peak Hour	P.M. Peak Hour	8-Hour
25 Feet from Roadway Edge	3.6	3.6	2.0
50 Feet from Roadway Edge	3.5	3.5	1.9
100 Feet from Roadway Edge	3.4	3.4	1.8

<sup>2</sup> Methodology from Bay Area Air Quality Management District *BAAQMD CEQA Guidelines* (1996).

# SIMPLIFIED CALINE4 CARBON MONOXIDE ANALYSIS

Project Number: 10953-00  
 Project Title: City of Lake Forest Opportunities Study Program EIR

## Background Information

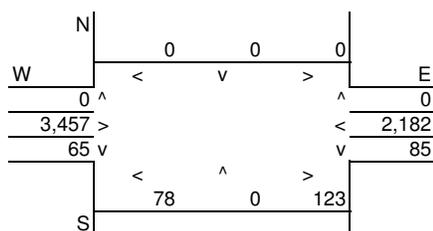
Nearest Air Monitoring Station measuring CO: Mission Viejo - 26081 Via Pera  
 Background 1-hour CO Concentration (ppm): 3.0  
 Background 8-hour CO Concentration (ppm): 1.5  
 Persistence Factor: 0.8  
 Analysis Year: 2030

## Roadway Data

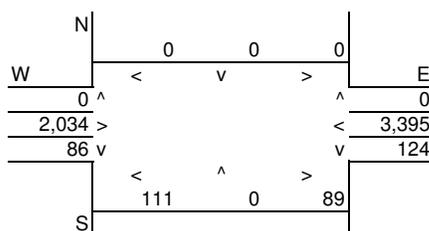
Intersection: B Dr. at Irvine Bl.  
 Analysis Condition: Year 2030 Traffic Volumes - Existing General Plan

	Roadway Type	No. of Lanes	Average Speed	
			A.M.	P.M.
North-South Roadway:	B Dr.	2	15	20
East-West Roadway:	Irvine Bl.	8	15	20

### A.M. Peak Hour Traffic Volumes



### P.M. Peak Hour Traffic Volumes



### Highest Traffic Volumes (Vehicles per Hour)

N-S Road:	351	N-S Road:	410
E-W Road:	5,847	E-W Road:	5,642

## Roadway CO Contributions and Concentrations

$$\text{Emissions} = (A \times B \times C) / 100,000^1$$

Roadway	A <sub>1</sub>	A <sub>2</sub>	A <sub>3</sub>	B	C	Estimated CO Concentrations		
	Reference CO Concentrations 25 Feet	Reference CO Concentrations 50 Feet	Reference CO Concentrations 100 Feet	Traffic Volume	Emission Factors <sup>2</sup>	25 Feet	50 Feet	100 Feet
A.M. Peak Traffic Hour								
North-South Road	2.7	2.2	1.7	351	1.23	0.01	0.01	0.01
East-West Road	5.7	4.6	3.4	5,847	1.23	0.41	0.33	0.24
P.M. Peak Traffic Hour								
North-South Road	2.7	2.2	1.7	410	1.09	0.01	0.01	0.01
East-West Road	5.7	4.6	3.4	5,642	1.09	0.35	0.28	0.21

<sup>1</sup> Methodology from Bay Area Air Quality Management District *BAAQMD CEQA Guidelines* (1996).

<sup>2</sup> Emission factors from EMFAC2002 (2003).

## Total Roadway CO Concentrations

$$\text{Peak Hour Emissions} = \text{North-South Concentration} + \text{East-West Concentration} + \text{Background 1-hour Concentration}^2$$

$$\text{8-Hour Emissions} = ((\text{Highest Peak Hour Concentration} - \text{Background 1-hour Concentration}) \times \text{Persistence Factor}) + \text{Background 8-hour Concentration}$$

	A.M. Peak Hour	P.M. Peak Hour	8-Hour
25 Feet from Roadway Edge	3.4	3.4	1.8
50 Feet from Roadway Edge	3.3	3.3	1.8
100 Feet from Roadway Edge	3.3	3.2	1.7

<sup>2</sup> Methodology from Bay Area Air Quality Management District *BAAQMD CEQA Guidelines* (1996).

# SIMPLIFIED CALINE4 CARBON MONOXIDE ANALYSIS

Project Number: 10953-00  
 Project Title: City of Lake Forest Opportunities Study Program EIR

## Background Information

Nearest Air Monitoring Station measuring CO: Mission Viejo - 26081 Via Pera  
 Background 1-hour CO Concentration (ppm): 3.0  
 Background 8-hour CO Concentration (ppm): 1.5  
 Persistence Factor: 0.8  
 Analysis Year: 2030

## Roadway Data

Intersection: A Dr. at Irvine Bl.  
 Analysis Condition: Year 2030 Traffic Volumes - Existing General Plan

	Roadway Type	No. of Lanes	Average Speed	
			A.M.	P.M.
North-South Roadway:	A Dr.	8	15	15
East-West Roadway:	Irvine Bl.	8	15	15

### A.M. Peak Hour Traffic Volumes

N	146	222	164	E
W	<	v	>	
	97 ^			84 ^
	2,920 >			< 2,018
	434 v			334 v
	<	^	>	
	166	58	186	S

### P.M. Peak Hour Traffic Volumes

N	117	125	88	E
W	<	v	>	
	112 ^			144 ^
	1,690 >			< 2,869
	256 v			329 v
	<	^	>	
	444	204	342	S

### Highest Traffic Volumes (Vehicles per Hour)

N-S Road: 1,400	N-S Road: 1,700
E-W Road: 5,781	E-W Road: 5,488

## Roadway CO Contributions and Concentrations

$$\text{Emissions} = (A \times B \times C) / 100,000^1$$

Roadway	A <sub>1</sub>	A <sub>2</sub>	A <sub>3</sub>	B	C	Estimated CO Concentrations		
	Reference CO Concentrations 25 Feet	50 Feet	100 Feet	Traffic Volume	Emission Factors <sup>2</sup>	25 Feet	50 Feet	100 Feet
A.M. Peak Traffic Hour								
North-South Road	2.2	1.9	1.6	1,400	1.23	0.04	0.03	0.03
East-West Road	5.7	4.6	3.4	5,781	1.23	0.41	0.33	0.24
P.M. Peak Traffic Hour								
North-South Road	2.2	1.9	1.6	1,700	1.23	0.05	0.04	0.03
East-West Road	5.7	4.6	3.4	5,488	1.23	0.38	0.31	0.23

<sup>1</sup> Methodology from Bay Area Air Quality Management District *BAAQMD CEQA Guidelines* (1996).

<sup>2</sup> Emission factors from EMFAC2002 (2003).

## Total Roadway CO Concentrations

$$\text{Peak Hour Emissions} = \text{North-South Concentration} + \text{East-West Concentration} + \text{Background 1-hour Concentration}^2$$

$$\text{8-Hour Emissions} = ((\text{Highest Peak Hour Concentration} - \text{Background 1-hour Concentration}) \times \text{Persistence Factor}) + \text{Background 8-hour Concentration}$$

	A.M. Peak Hour	P.M. Peak Hour	8-Hour
25 Feet from Roadway Edge	3.4	3.4	1.9
50 Feet from Roadway Edge	3.4	3.4	1.8
100 Feet from Roadway Edge	3.3	3.3	1.7

<sup>2</sup> Methodology from Bay Area Air Quality Management District *BAAQMD CEQA Guidelines* (1996).





# SIMPLIFIED CALINE4 CARBON MONOXIDE ANALYSIS

**Project Number:** 10953-00  
**Project Title:** City of Lake Forest Opportunities Study Program EIR

## Background Information

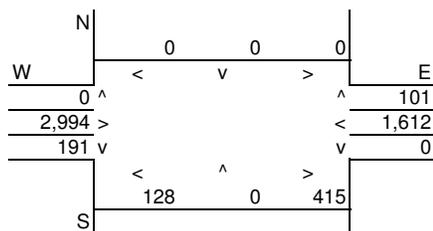
Nearest Air Monitoring Station measuring CO: Mission Viejo - 26081 Via Pera  
 Background 1-hour CO Concentration (ppm): 3.0  
 Background 8-hour CO Concentration (ppm): 1.5  
 Persistence Factor: 0.8  
 Analysis Year: 2030

## Roadway Data

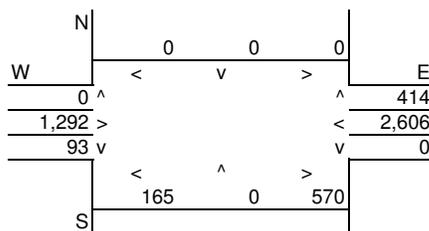
Intersection: ETC E. Leg NB Ramps at Irvine Bl.  
 Analysis Condition: Year 2030 Traffic Volumes - Existing General Plan

	Roadway Type	No. of Lanes	Average Speed		
			A.M.	P.M.	
North-South Roadway:	ETC E. Leg NB Ramps	At Grade	2	15	20
East-West Roadway:	Irvine Bl.	At Grade	6	15	20

### A.M. Peak Hour Traffic Volumes



### P.M. Peak Hour Traffic Volumes



### Highest Traffic Volumes (Vehicles per Hour)

N-S Road:	734	N-S Road:	828
E-W Road:	5,122	E-W Road:	4,882

## Roadway CO Contributions and Concentrations

$$\text{Emissions} = (A \times B \times C) / 100,000^1$$

Roadway	A <sub>1</sub>	A <sub>2</sub>	A <sub>3</sub>	B	C	Estimated CO Concentrations		
	Reference CO Concentrations 25 Feet	50 Feet	100 Feet	Traffic Volume	Emission Factors <sup>2</sup>	25 Feet	50 Feet	100 Feet
<b>A.M. Peak Traffic Hour</b>								
North-South Road	2.7	2.2	1.7	734	1.23	0.02	0.02	0.02
East-West Road	6.1	4.9	3.5	5,122	1.23	0.38	0.31	0.22
<b>P.M. Peak Traffic Hour</b>								
North-South Road	2.7	2.2	1.7	828	1.09	0.02	0.02	0.02
East-West Road	6.1	4.9	3.5	4,882	1.09	0.32	0.26	0.19

<sup>1</sup> Methodology from Bay Area Air Quality Management District *BAAQMD CEQA Guidelines* (1996).

<sup>2</sup> Emission factors from EMFAC2002 (2003).

## Total Roadway CO Concentrations

$$\text{Peak Hour Emissions} = \text{North-South Concentration} + \text{East-West Concentration} + \text{Background 1-hour Concentration}^2$$

$$\text{8-Hour Emissions} = ((\text{Highest Peak Hour Concentration} - \text{Background 1-hour Concentration}) \times \text{Persistence Factor}) + \text{Background 8-hour Concentration}$$

	A.M. Peak Hour	P.M. Peak Hour	8-Hour
25 Feet from Roadway Edge	3.4	3.3	1.8
50 Feet from Roadway Edge	3.3	3.3	1.8
100 Feet from Roadway Edge	3.2	3.2	1.7

<sup>2</sup> Methodology from Bay Area Air Quality Management District *BAAQMD CEQA Guidelines* (1996).

# SIMPLIFIED CALINE4 CARBON MONOXIDE ANALYSIS

**Project Number:** 10953-00  
**Project Title:** City of Lake Forest Opportunities Study Program EIR

## Background Information

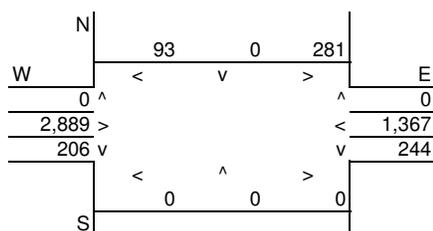
Nearest Air Monitoring Station measuring CO: Mission Viejo - 26081 Via Pera  
 Background 1-hour CO Concentration (ppm): 3.0  
 Background 8-hour CO Concentration (ppm): 1.5  
 Persistence Factor: 0.8  
 Analysis Year: 2030

## Roadway Data

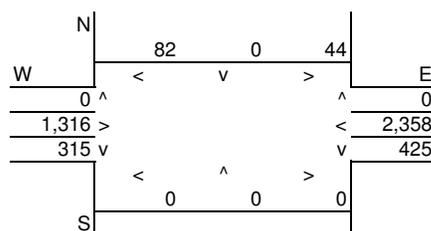
Intersection: ETC E. Leg SB Ramps at Irvine Bl.  
 Analysis Condition: Year 2030 Traffic Volumes - Existing General Plan

	Roadway Type	No. of Lanes	Average Speed	
			A.M.	P.M.
North-South Roadway:	ETC E. Leg SB Ramps	4	15	20
East-West Roadway:	Irvine Bl.	8	15	20

### A.M. Peak Hour Traffic Volumes



### P.M. Peak Hour Traffic Volumes



### Highest Traffic Volumes (Vehicles per Hour)

N-S Road:	450	N-S Road:	740
E-W Road:	4,781	E-W Road:	4,143

## Roadway CO Contributions and Concentrations

Emissions = (A x B x C) / 100,000<sup>1</sup>

Roadway	A <sub>1</sub>	A <sub>2</sub>	A <sub>3</sub>	B	C	Estimated CO Concentrations		
	Reference CO Concentrations 25 Feet	50 Feet	100 Feet	Traffic Volume	Emission Factors <sup>2</sup>	25 Feet	50 Feet	100 Feet
<b>A.M. Peak Traffic Hour</b>								
North-South Road	2.6	2.2	1.7	450	1.23	0.01	0.01	0.01
East-West Road	5.7	4.6	3.4	4,781	1.23	0.34	0.27	0.20
<b>P.M. Peak Traffic Hour</b>								
North-South Road	2.6	2.2	1.7	740	1.09	0.02	0.02	0.01
East-West Road	5.7	4.6	3.4	4,143	1.09	0.26	0.21	0.15

<sup>1</sup> Methodology from Bay Area Air Quality Management District *BAAQMD CEQA Guidelines* (1996).

<sup>2</sup> Emission factors from EMFAC2002 (2003).

## Total Roadway CO Concentrations

Peak Hour Emissions = North-South Concentration + East-West Concentration + Background 1-hour Concentration<sup>2</sup>

8-Hour Emissions = ((Highest Peak Hour Concentration - Background 1-hour Concentration) x Persistence Factor) + Background 8-hour Concentration

	A.M. Peak Hour	P.M. Peak Hour	8-Hour
25 Feet from Roadway Edge	3.3	3.3	1.8
50 Feet from Roadway Edge	3.3	3.2	1.7
100 Feet from Roadway Edge	3.2	3.2	1.7

<sup>2</sup> Methodology from Bay Area Air Quality Management District *BAAQMD CEQA Guidelines* (1996).



# SIMPLIFIED CALINE4 CARBON MONOXIDE ANALYSIS

Project Number: 10953-00  
 Project Title: City of Lake Forest Opportunities Study Program EIR

## Background Information

Nearest Air Monitoring Station measuring CO: Mission Viejo - 26081 Via Pera  
 Background 1-hour CO Concentration (ppm): 3.0  
 Background 8-hour CO Concentration (ppm): 1.5  
 Persistence Factor: 0.8  
 Analysis Year: 2030

## Roadway Data

Intersection: Jeffrey Rd. at Irvine Bl.  
 Analysis Condition: Year 2030 Traffic Volumes - Existing General Plan

	Roadway Type	No. of Lanes	Average Speed		
			A.M.	P.M.	
North-South Roadway:	Jeffrey Rd.	At Grade	8	15	15
East-West Roadway:	Irvine Bl.	At Grade	8	15	15

### A.M. Peak Hour Traffic Volumes

N	339	1,670	529	E
W	<	v	>	E
	136 ^		190	
	2,312 >		789	
	60 v		124	
S	<	^	>	
	38	555	256	

### P.M. Peak Hour Traffic Volumes

N	143	853	168	E
W	<	v	>	E
	163 ^		183	
	1,015 >		2,403	
	186 v		694	
S	<	^	>	
	314	1,617	571	

### Highest Traffic Volumes (Vehicles per Hour)

N-S Road:	3,419	N-S Road:	4,235
E-W Road:	4,200	E-W Road:	5,034

## Roadway CO Contributions and Concentrations

$$\text{Emissions} = (A \times B \times C) / 100,000^1$$

Roadway	A <sub>1</sub>	A <sub>2</sub>	A <sub>3</sub>	B	C	Estimated CO Concentrations		
	Reference CO Concentrations 25 Feet	50 Feet	100 Feet	Traffic Volume	Emission Factors <sup>2</sup>	25 Feet	50 Feet	100 Feet
A.M. Peak Traffic Hour								
North-South Road	2.2	1.9	1.6	3,419	1.23	0.09	0.08	0.07
East-West Road	5.7	4.6	3.4	4,200	1.23	0.29	0.24	0.18
P.M. Peak Traffic Hour								
North-South Road	2.2	1.9	1.6	4,235	1.23	0.11	0.10	0.08
East-West Road	5.7	4.6	3.4	5,034	1.23	0.35	0.28	0.21

<sup>1</sup> Methodology from Bay Area Air Quality Management District *BAAQMD CEQA Guidelines* (1996).

<sup>2</sup> Emission factors from EMFAC2002 (2003).

## Total Roadway CO Concentrations

$$\text{Peak Hour Emissions} = \text{North-South Concentration} + \text{East-West Concentration} + \text{Background 1-hour Concentration}^2$$

$$\text{8-Hour Emissions} = ((\text{Highest Peak Hour Concentration} - \text{Background 1-hour Concentration}) \times \text{Persistence Factor}) + \text{Background 8-hour Concentration}$$

	A.M. Peak Hour	P.M. Peak Hour	8-Hour
25 Feet from Roadway Edge	3.4	3.5	1.9
50 Feet from Roadway Edge	3.3	3.4	1.8
100 Feet from Roadway Edge	3.2	3.3	1.7

<sup>2</sup> Methodology from Bay Area Air Quality Management District *BAAQMD CEQA Guidelines* (1996).

# SIMPLIFIED CALINE4 CARBON MONOXIDE ANALYSIS

**Project Number:** 10953-00  
**Project Title:** City of Lake Forest Opportunities Study Program EIR

## Background Information

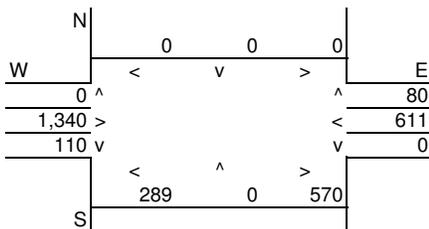
Nearest Air Monitoring Station measuring CO: Mission Viejo - 26081 Via Pera  
 Background 1-hour CO Concentration (ppm): 3.0  
 Background 8-hour CO Concentration (ppm): 1.5  
 Persistence Factor: 0.8  
 Analysis Year: 2030

## Roadway Data

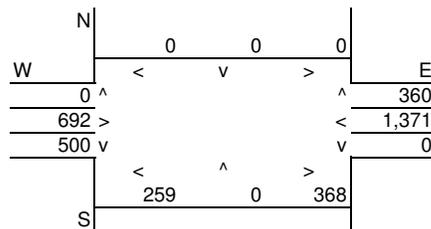
Intersection: SR-133 NB Ramps at Trabuco Rd.  
 Analysis Condition: Year 2030 Traffic Volumes - Existing General Plan

	Roadway Type	No. of Lanes	Average Speed	
			A.M.	P.M.
North-South Roadway:	SR-133 NB Ramps	4	20	20
East-West Roadway:	Trabuco Rd.	4	20	20

### A.M. Peak Hour Traffic Volumes



### P.M. Peak Hour Traffic Volumes



### Highest Traffic Volumes (Vehicles per Hour)

N-S Road:	969	N-S Road:	1,127
E-W Road:	2,601	E-W Road:	2,822

## Roadway CO Contributions and Concentrations

Emissions = (A x B x C) / 100,000<sup>1</sup>

Roadway	A <sub>1</sub>	A <sub>2</sub>	A <sub>3</sub>	B	C	Estimated CO Concentrations		
	Reference CO Concentrations 25 Feet	50 Feet	100 Feet	Traffic Volume	Emission Factors <sup>2</sup>	25 Feet	50 Feet	100 Feet
<b>A.M. Peak Traffic Hour</b>								
North-South Road	2.6	2.2	1.7	969	1.09	0.03	0.02	0.02
East-West Road	7.0	5.4	3.8	2,601	1.09	0.20	0.15	0.11
<b>P.M. Peak Traffic Hour</b>								
North-South Road	2.6	2.2	1.7	1,127	1.09	0.03	0.03	0.02
East-West Road	7.0	5.4	3.8	2,822	1.09	0.22	0.17	0.12

<sup>1</sup> Methodology from Bay Area Air Quality Management District *BAAQMD CEQA Guidelines* (1996).

<sup>2</sup> Emission factors from EMFAC2002 (2003).

## Total Roadway CO Concentrations

Peak Hour Emissions = North-South Concentration + East-West Concentration + Background 1-hour Concentration<sup>2</sup>

8-Hour Emissions = ((Highest Peak Hour Concentration - Background 1-hour Concentration) x Persistence Factor) + Background 8-hour Concentration

	A.M. Peak Hour	P.M. Peak Hour	8-Hour
25 Feet from Roadway Edge	3.2	3.2	1.7
50 Feet from Roadway Edge	3.2	3.2	1.7
100 Feet from Roadway Edge	3.1	3.1	1.6

<sup>2</sup> Methodology from Bay Area Air Quality Management District *BAAQMD CEQA Guidelines* (1996).

# SIMPLIFIED CALINE4 CARBON MONOXIDE ANALYSIS

Project Number: 10953-00  
 Project Title: City of Lake Forest Opportunities Study Program EIR

## Background Information

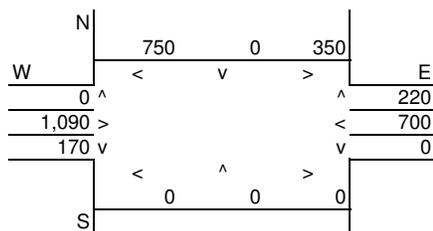
Nearest Air Monitoring Station measuring CO: Mission Viejo - 26081 Via Pera  
 Background 1-hour CO Concentration (ppm): 3.0  
 Background 8-hour CO Concentration (ppm): 1.5  
 Persistence Factor: 0.8  
 Analysis Year: 2030

## Roadway Data

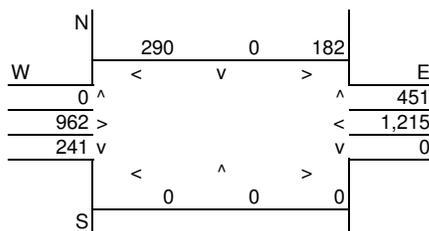
Intersection: SR-133 SB Ramps at Trabuco Rd.  
 Analysis Condition: Year 2030 Traffic Volumes - Existing General Plan

	Roadway Type	No. of Lanes	Average Speed	
			A.M.	P.M.
North-South Roadway:	SR-133 SB Ramps	4	20	20
East-West Roadway:	Trabuco Rd.	4	20	20

### A.M. Peak Hour Traffic Volumes



### P.M. Peak Hour Traffic Volumes



### Highest Traffic Volumes (Vehicles per Hour)

N-S Road:	1,320	N-S Road:	923
E-W Road:	2,710	E-W Road:	2,810

## Roadway CO Contributions and Concentrations

Emissions = (A x B x C) / 100,000<sup>1</sup>

Roadway	A <sub>1</sub>	A <sub>2</sub>	A <sub>3</sub>	B	C	Estimated CO Concentrations		
	Reference CO Concentrations 25 Feet	50 Feet	100 Feet	Traffic Volume	Emission Factors <sup>2</sup>	25 Feet	50 Feet	100 Feet
<b>A.M. Peak Traffic Hour</b>								
North-South Road	2.6	2.2	1.7	1,320	1.09	0.04	0.03	0.02
East-West Road	7.0	5.4	3.8	2,710	1.09	0.21	0.16	0.11
<b>P.M. Peak Traffic Hour</b>								
North-South Road	2.6	2.2	1.7	923	1.09	0.03	0.02	0.02
East-West Road	7.0	5.4	3.8	2,810	1.09	0.21	0.17	0.12

<sup>1</sup> Methodology from Bay Area Air Quality Management District *BAAQMD CEQA Guidelines* (1996).

<sup>2</sup> Emission factors from EMFAC2002 (2003).

## Total Roadway CO Concentrations

Peak Hour Emissions = North-South Concentration + East-West Concentration + Background 1-hour Concentration<sup>2</sup>

8-Hour Emissions = ((Highest Peak Hour Concentration - Background 1-hour Concentration) x Persistence Factor) + Background 8-hour Concentration

	A.M. Peak Hour	P.M. Peak Hour	8-Hour
25 Feet from Roadway Edge	3.2	3.2	1.7
50 Feet from Roadway Edge	3.2	3.2	1.7
100 Feet from Roadway Edge	3.1	3.1	1.6

<sup>2</sup> Methodology from Bay Area Air Quality Management District *BAAQMD CEQA Guidelines* (1996).

# SIMPLIFIED CALINE4 CARBON MONOXIDE ANALYSIS

**Project Number:** 10953-00  
**Project Title:** City of Lake Forest Opportunities Study Program EIR

## Background Information

Nearest Air Monitoring Station measuring CO: Mission Viejo - 26081 Via Pera  
 Background 1-hour CO Concentration (ppm): 3.0  
 Background 8-hour CO Concentration (ppm): 1.5  
 Persistence Factor: 0.8  
 Analysis Year: 2030

## Roadway Data

Intersection: Sand Cyn. Ave. at Trabuco Rd.  
 Analysis Condition: Year 2030 Traffic Volumes - Existing General Plan

	Roadway Type	No. of Lanes	Average Speed		
			A.M.	P.M.	
North-South Roadway:	San Cyn. Ave.	At Grade	8	20	20
East-West Roadway:	Trabuco Rd.	At Grade	8	20	20

### A.M. Peak Hour Traffic Volumes

	N							
		192	2,114	311				
W	<	v		>				E
		287	^					342
		680	>					499
		514	v					611
			<					
		179	^					289
		1,101	>					
S								

### P.M. Peak Hour Traffic Volumes

	N							
		252	1,393	237				
W	<	v		>				E
		242	^					322
		520	>					736
		338	v					452
			<					
		514	^					485
		2,029	>					
S								

### Highest Traffic Volumes (Vehicles per Hour)

N-S Road:	4,808	N-S Road:	5,211
E-W Road:	2,732	E-W Road:	2,752

## Roadway CO Contributions and Concentrations

Emissions = (A x B x C) / 100,000<sup>1</sup>

Roadway	Reference CO Concentrations			B Traffic Volume	C Emission Factors <sup>2</sup>	Estimated CO Concentrations		
	A <sub>1</sub> 25 Feet	A <sub>2</sub> 50 Feet	A <sub>3</sub> 100 Feet			25 Feet	50 Feet	100 Feet
<b>A.M. Peak Traffic Hour</b>								
North-South Road	5.7	4.6	3.4	4,808	1.09	0.30	0.24	0.18
East-West Road	2.2	1.9	1.6	2,732	1.09	0.07	0.06	0.05
<b>P.M. Peak Traffic Hour</b>								
North-South Road	5.7	4.6	3.4	5,211	1.09	0.32	0.26	0.19
East-West Road	2.2	1.9	1.6	2,752	1.09	0.07	0.06	0.05

<sup>1</sup> Methodology from Bay Area Air Quality Management District *BAAQMD CEQA Guidelines* (1996).

<sup>2</sup> Emission factors from EMFAC2002 (2003).

## Total Roadway CO Concentrations

Peak Hour Emissions = North-South Concentration + East-West Concentration + Background 1-hour Concentration<sup>2</sup>

8-Hour Emissions = ((Highest Peak Hour Concentration - Background 1-hour Concentration) x Persistence Factor) + Background 8-hour Concentration

	A.M. Peak Hour	P.M. Peak Hour	8-Hour
25 Feet from Roadway Edge	3.4	3.4	1.8
50 Feet from Roadway Edge	3.3	3.3	1.8
100 Feet from Roadway Edge	3.2	3.2	1.7

<sup>2</sup> Methodology from Bay Area Air Quality Management District *BAAQMD CEQA Guidelines* (1996).

# SIMPLIFIED CALINE4 CARBON MONOXIDE ANALYSIS

Project Number: 10953-00  
 Project Title: City of Lake Forest Opportunities Study Program EIR

## Background Information

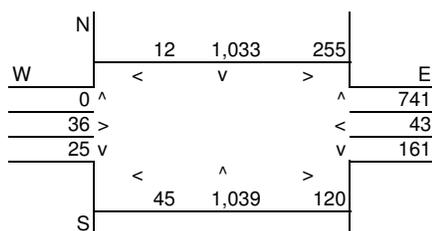
Nearest Air Monitoring Station measuring CO: Mission Viejo - 26081 Via Pera  
 Background 1-hour CO Concentration (ppm): 3.0  
 Background 8-hour CO Concentration (ppm): 1.5  
 Persistence Factor: 0.8  
 Analysis Year: 2030

## Roadway Data

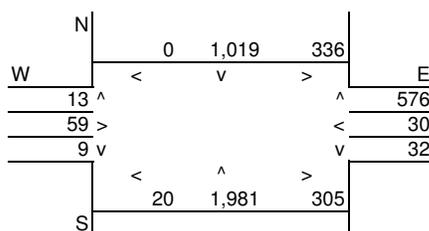
Intersection: Alton Pkwy at Toledo Wy  
 Analysis Condition: Year 2030 Traffic Volumes - Existing General Plan

	Roadway Type	No. of Lanes	Average Speed		
			A.M.	P.M.	
North-South Roadway:	Alton Pkwy.	At Grade	8	20	15
East-West Roadway:	Toledo Wy.	At Grade	6	20	15

### A.M. Peak Hour Traffic Volumes



### P.M. Peak Hour Traffic Volumes



### Highest Traffic Volumes (Vehicles per Hour)

N-S Road: 3,080	N-S Road: 3,925
E-W Road: 1,356	E-W Road: 1,338

## Roadway CO Contributions and Concentrations

$$\text{Emissions} = (A \times B \times C) / 100,000^1$$

Roadway	A <sub>1</sub>	A <sub>2</sub>	A <sub>3</sub>	B	C	Estimated CO Concentrations		
	Reference CO Concentrations 25 Feet	50 Feet	100 Feet	Traffic Volume	Emission Factors <sup>2</sup>	25 Feet	50 Feet	100 Feet
A.M. Peak Traffic Hour								
North-South Road	5.7	4.6	3.4	3,080	1.09	0.19	0.15	0.11
East-West Road	2.3	2.0	1.7	1,356	1.09	0.03	0.03	0.03
P.M. Peak Traffic Hour								
North-South Road	5.7	4.6	3.4	3,925	1.23	0.28	0.22	0.16
East-West Road	2.3	2.0	1.7	1,338	1.23	0.04	0.03	0.03

<sup>1</sup> Methodology from Bay Area Air Quality Management District *BAAQMD CEQA Guidelines* (1996).

<sup>2</sup> Emission factors from EMFAC2002 (2003).

## Total Roadway CO Concentrations

$$\text{Peak Hour Emissions} = \text{North-South Concentration} + \text{East-West Concentration} + \text{Background 1-hour Concentration}^2$$

$$\text{8-Hour Emissions} = ((\text{Highest Peak Hour Concentration} - \text{Background 1-hour Concentration}) \times \text{Persistence Factor}) + \text{Background 8-hour Concentration}$$

	A.M. Peak Hour	P.M. Peak Hour	8-Hour
25 Feet from Roadway Edge	3.2	3.3	1.8
50 Feet from Roadway Edge	3.2	3.3	1.7
100 Feet from Roadway Edge	3.1	3.2	1.7

<sup>2</sup> Methodology from Bay Area Air Quality Management District *BAAQMD CEQA Guidelines* (1996).

# SIMPLIFIED CALINE4 CARBON MONOXIDE ANALYSIS

**Project Number:** 10953-00  
**Project Title:** City of Lake Forest Opportunities Study Program EIR

## Background Information

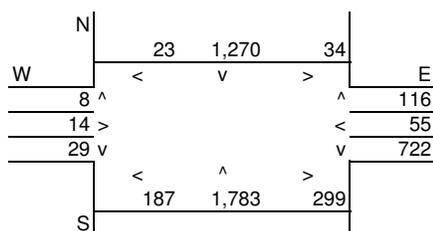
Nearest Air Monitoring Station measuring CO: Mission Viejo - 26081 Via Pera  
 Background 1-hour CO Concentration (ppm): 3.0  
 Background 8-hour CO Concentration (ppm): 1.5  
 Persistence Factor: 0.8  
 Analysis Year: 2030

## Roadway Data

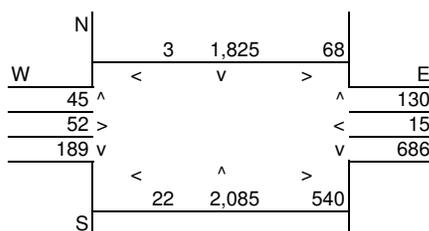
Intersection: Alton Pkwy at Jeronimo Rd  
 Analysis Condition: Year 2030 Traffic Volumes - Existing General Plan

	Roadway Type	No. of Lanes	Average Speed		
			A.M.	P.M.	
North-South Roadway:	Alton Pkwy.	At Grade	8	20	20
East-West Roadway:	Jeronimo Rd.	At Grade	6	20	20

### A.M. Peak Hour Traffic Volumes



### P.M. Peak Hour Traffic Volumes



### Highest Traffic Volumes (Vehicles per Hour)

N-S Road:	4,290	N-S Road:	5,347
E-W Road:	1,240	E-W Road:	1,491

## Roadway CO Contributions and Concentrations

Emissions = (A x B x C) / 100,000<sup>1</sup>

Roadway	A <sub>1</sub>	A <sub>2</sub>	A <sub>3</sub>	B	C	Estimated CO Concentrations		
	Reference CO Concentrations 25 Feet	50 Feet	100 Feet	Traffic Volume	Emission Factors <sup>2</sup>	25 Feet	50 Feet	100 Feet
<b>A.M. Peak Traffic Hour</b>								
North-South Road	5.7	4.6	3.4	4,290	1.09	0.27	0.22	0.16
East-West Road	2.3	2.0	1.7	1,240	1.09	0.03	0.03	0.02
<b>P.M. Peak Traffic Hour</b>								
North-South Road	5.7	4.6	3.4	5,347	1.09	0.33	0.27	0.20
East-West Road	2.3	2.0	1.7	1,491	1.09	0.04	0.03	0.03

<sup>1</sup> Methodology from Bay Area Air Quality Management District *BAAQMD CEQA Guidelines* (1996).

<sup>2</sup> Emission factors from EMFAC2002 (2003).

## Total Roadway CO Concentrations

Peak Hour Emissions = North-South Concentration + East-West Concentration + Background 1-hour Concentration<sup>2</sup>

8-Hour Emissions = ((Highest Peak Hour Concentration - Background 1-hour Concentration) x Persistence Factor) + Background 8-hour Concentration

	A.M. Peak Hour	P.M. Peak Hour	8-Hour
25 Feet from Roadway Edge	3.3	3.4	1.8
50 Feet from Roadway Edge	3.2	3.3	1.7
100 Feet from Roadway Edge	3.2	3.2	1.7

<sup>2</sup> Methodology from Bay Area Air Quality Management District *BAAQMD CEQA Guidelines* (1996).

# SIMPLIFIED CALINE4 CARBON MONOXIDE ANALYSIS

**Project Number:** 10953-00  
**Project Title:** City of Lake Forest Opportunities Study Program EIR

## Background Information

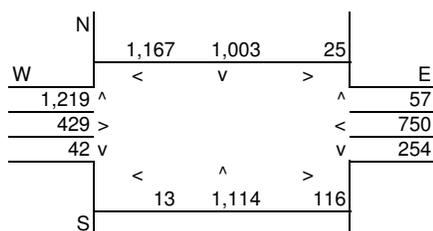
Nearest Air Monitoring Station measuring CO: Mission Viejo - 26081 Via Pera  
 Background 1-hour CO Concentration (ppm): 3.0  
 Background 8-hour CO Concentration (ppm): 1.5  
 Persistence Factor: 0.8  
 Analysis Year: 2030

## Roadway Data

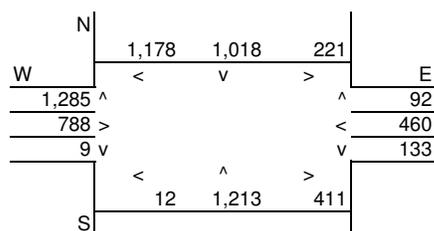
Intersection: Alton Pkwy at Muirlands Bl  
 Analysis Condition: Year 2030 Traffic Volumes - Existing General Plan

	Roadway Type	No. of Lanes	Average Speed		
			A.M.	P.M.	
North-South Roadway:	Alton Pkwy.	At Grade	8	20	15
East-West Roadway:	Muirlands Bl.	At Grade	8	20	15

### A.M. Peak Hour Traffic Volumes



### P.M. Peak Hour Traffic Volumes



### Highest Traffic Volumes (Vehicles per Hour)

N-S Road: 4,585                      N-S Road: 5,007  
 E-W Road: 3,620                      E-W Road: 3,732

## Roadway CO Contributions and Concentrations

Emissions = (A x B x C) / 100,000<sup>1</sup>

Roadway	A <sub>1</sub>	A <sub>2</sub>	A <sub>3</sub>	B	C	Estimated CO Concentrations		
	Reference CO Concentrations 25 Feet	50 Feet	100 Feet	Traffic Volume	Emission Factors <sup>2</sup>	25 Feet	50 Feet	100 Feet
<b>A.M. Peak Traffic Hour</b>								
North-South Road	5.7	4.6	3.4	4,585	1.09	0.28	0.23	0.17
East-West Road	2.2	1.9	1.6	3,620	1.09	0.09	0.07	0.06
<b>P.M. Peak Traffic Hour</b>								
North-South Road	5.7	4.6	3.4	5,007	1.23	0.35	0.28	0.21
East-West Road	2.2	1.9	1.6	3,732	1.23	0.10	0.09	0.07

<sup>1</sup> Methodology from Bay Area Air Quality Management District *BAAQMD CEQA Guidelines* (1996).

<sup>2</sup> Emission factors from EMFAC2002 (2003).

## Total Roadway CO Concentrations

Peak Hour Emissions = North-South Concentration + East-West Concentration + Background 1-hour Concentration<sup>2</sup>

8-Hour Emissions = ((Highest Peak Hour Concentration - Background 1-hour Concentration) x Persistence Factor) + Background 8-hour Concentration

	A.M. Peak Hour	P.M. Peak Hour	8-Hour
25 Feet from Roadway Edge	3.4	3.5	1.9
50 Feet from Roadway Edge	3.3	3.4	1.8
100 Feet from Roadway Edge	3.2	3.3	1.7

<sup>2</sup> Methodology from Bay Area Air Quality Management District *BAAQMD CEQA Guidelines* (1996).

# SIMPLIFIED CALINE4 CARBON MONOXIDE ANALYSIS

**Project Number:** 10953-00  
**Project Title:** City of Lake Forest Opportunities Study Program EIR

## Background Information

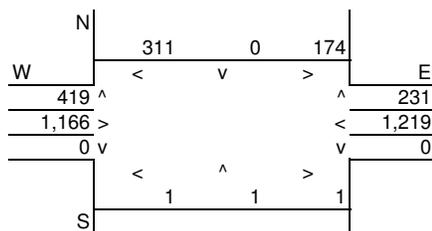
Nearest Air Monitoring Station measuring CO: Mission Viejo - 26081 Via Pera  
 Background 1-hour CO Concentration (ppm): 3.0  
 Background 8-hour CO Concentration (ppm): 1.5  
 Persistence Factor: 0.8  
 Analysis Year: 2030

## Roadway Data

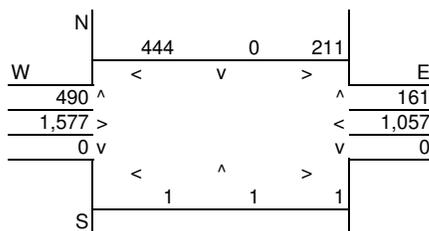
Intersection: Marine Wy at Alton Pk  
 Analysis Condition: Year 2030 Traffic Volumes - Existing General Plan

	Roadway Type	No. of Lanes	Average Speed		
			A.M.	P.M.	
North-South Roadway:	Marine Wy.	At Grade	8	20	20
East-West Roadway:	Alton Pk.	At Grade	8	20	20

### A.M. Peak Hour Traffic Volumes



### P.M. Peak Hour Traffic Volumes



### Highest Traffic Volumes (Vehicles per Hour)

N-S Road:	1,136	N-S Road:	1,307
E-W Road:	3,116	E-W Road:	3,569

## Roadway CO Contributions and Concentrations

Emissions = (A x B x C) / 100,000<sup>1</sup>

Roadway	A <sub>1</sub>	A <sub>2</sub>	A <sub>3</sub>	B	C	Estimated CO Concentrations		
	Reference CO Concentrations 25 Feet	50 Feet	100 Feet	Traffic Volume	Emission Factors <sup>2</sup>	25 Feet	50 Feet	100 Feet
<b>A.M. Peak Traffic Hour</b>								
North-South Road	2.2	1.9	1.6	1,136	1.09	0.03	0.02	0.02
East-West Road	5.7	4.6	3.4	3,116	1.09	0.19	0.16	0.12
<b>P.M. Peak Traffic Hour</b>								
North-South Road	2.2	1.9	1.6	1,307	1.09	0.03	0.03	0.02
East-West Road	5.7	4.6	3.4	3,569	1.09	0.22	0.18	0.13

<sup>1</sup> Methodology from Bay Area Air Quality Management District *BAAQMD CEQA Guidelines* (1996).

<sup>2</sup> Emission factors from EMFAC2002 (2003).

## Total Roadway CO Concentrations

Peak Hour Emissions = North-South Concentration + East-West Concentration + Background 1-hour Concentration<sup>2</sup>

8-Hour Emissions = ((Highest Peak Hour Concentration - Background 1-hour Concentration) x Persistence Factor) + Background 8-hour Concentration

	A.M. Peak Hour	P.M. Peak Hour	8-Hour
25 Feet from Roadway Edge	3.2	3.3	1.7
50 Feet from Roadway Edge	3.2	3.2	1.7
100 Feet from Roadway Edge	3.1	3.2	1.6

<sup>2</sup> Methodology from Bay Area Air Quality Management District *BAAQMD CEQA Guidelines* (1996).

# SIMPLIFIED CALINE4 CARBON MONOXIDE ANALYSIS

Project Number: 10953-00  
 Project Title: City of Lake Forest Opportunities Study Program EIR

## Background Information

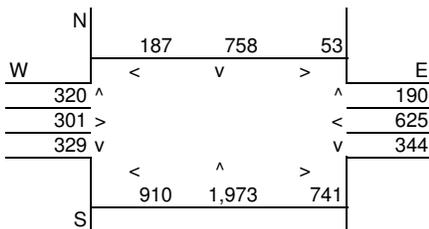
Nearest Air Monitoring Station measuring CO: Mission Viejo - 26081 Via Pera  
 Background 1-hour CO Concentration (ppm): 3.0  
 Background 8-hour CO Concentration (ppm): 1.5  
 Persistence Factor: 0.8  
 Analysis Year: 2030

## Roadway Data

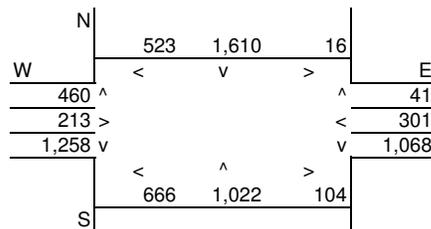
Intersection: Alton Pkwy at Technology Dr. W.  
 Analysis Condition: Year 2030 Traffic Volumes - Existing General Plan

	Roadway Type	No. of Lanes	Average Speed		
			A.M.	P.M.	
North-South Roadway:	Alton Pkwy.	At Grade	8	15	15
East-West Roadway:	Technology Dr. W.	At Grade	8	15	15

### A.M. Peak Hour Traffic Volumes



### P.M. Peak Hour Traffic Volumes



### Highest Traffic Volumes (Vehicles per Hour)

N-S Road:	5,055	N-S Road:	5,728
E-W Road:	2,672	E-W Road:	3,421

## Roadway CO Contributions and Concentrations

Emissions = (A x B x C) / 100,000<sup>1</sup>

Roadway	A <sub>1</sub>	A <sub>2</sub>	A <sub>3</sub>	B	C	Estimated CO Concentrations		
	Reference CO Concentrations 25 Feet	50 Feet	100 Feet	Traffic Volume	Emission Factors <sup>2</sup>	25 Feet	50 Feet	100 Feet
A.M. Peak Traffic Hour								
North-South Road	5.7	4.6	3.4	5,055	1.23	0.35	0.29	0.21
East-West Road	2.2	1.9	1.6	2,672	1.23	0.07	0.06	0.05
P.M. Peak Traffic Hour								
North-South Road	5.7	4.6	3.4	5,728	1.23	0.40	0.32	0.24
East-West Road	2.2	1.9	1.6	3,421	1.23	0.09	0.08	0.07

<sup>1</sup> Methodology from Bay Area Air Quality Management District *BAAQMD CEQA Guidelines* (1996).

<sup>2</sup> Emission factors from EMFAC2002 (2003).

## Total Roadway CO Concentrations

Peak Hour Emissions = North-South Concentration + East-West Concentration + Background 1-hour Concentration<sup>2</sup>

8-Hour Emissions = ((Highest Peak Hour Concentration - Background 1-hour Concentration) x Persistence Factor) + Background 8-hour Concentration

	A.M. Peak Hour	P.M. Peak Hour	8-Hour
25 Feet from Roadway Edge	3.4	3.5	1.9
50 Feet from Roadway Edge	3.3	3.4	1.8
100 Feet from Roadway Edge	3.3	3.3	1.7

<sup>2</sup> Methodology from Bay Area Air Quality Management District *BAAQMD CEQA Guidelines* (1996).

# SIMPLIFIED CALINE4 CARBON MONOXIDE ANALYSIS

Project Number: 10953-00  
 Project Title: City of Lake Forest Opportunities Study Program EIR

## Background Information

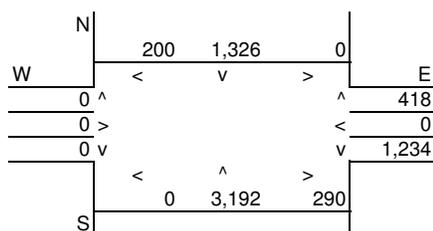
Nearest Air Monitoring Station measuring CO: Mission Viejo - 26081 Via Pera  
 Background 1-hour CO Concentration (ppm): 3.0  
 Background 8-hour CO Concentration (ppm): 1.5  
 Persistence Factor: 0.8  
 Analysis Year: 2030

## Roadway Data

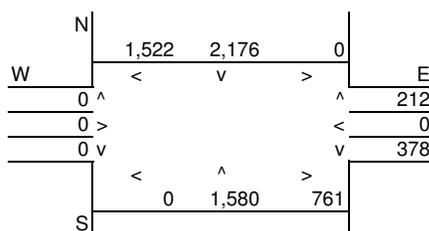
Intersection: Alton Pkwy at I-5 NB Ramps  
 Analysis Condition: Year 2030 Traffic Volumes - Existing General Plan

	Roadway Type	No. of Lanes	Average Speed		
			A.M.	P.M.	
North-South Roadway:	Alton Pkwy.	At Grade	6	10	20
East-West Roadway:	I-5 NB Ramps	At Grade	4	10	20

### A.M. Peak Hour Traffic Volumes



### P.M. Peak Hour Traffic Volumes



### Highest Traffic Volumes (Vehicles per Hour)

N-S Road: 6,042                      N-S Road: 5,490  
 E-W Road: 1,942                      E-W Road: 1,522

## Roadway CO Contributions and Concentrations

Emissions = (A x B x C) / 100,000<sup>1</sup>

Roadway	A <sub>1</sub>	A <sub>2</sub>	A <sub>3</sub>	B	C	Estimated CO Concentrations		
	Reference CO Concentrations 25 Feet	50 Feet	100 Feet	Traffic Volume	Emission Factors <sup>2</sup>	25 Feet	50 Feet	100 Feet
<b>A.M. Peak Traffic Hour</b>								
North-South Road	6.1	4.9	3.5	6,042	1.41	0.52	0.42	0.30
East-West Road	2.6	2.2	1.7	1,942	1.41	0.07	0.06	0.05
<b>P.M. Peak Traffic Hour</b>								
North-South Road	6.1	4.9	3.5	5,490	1.09	0.37	0.29	0.21
East-West Road	2.6	2.2	1.7	1,522	1.09	0.04	0.04	0.03

<sup>1</sup> Methodology from Bay Area Air Quality Management District *BAAQMD CEQA Guidelines* (1996).

<sup>2</sup> Emission factors from EMFAC2002 (2003).

## Total Roadway CO Concentrations

Peak Hour Emissions = North-South Concentration + East-West Concentration + Background 1-hour Concentration<sup>2</sup>

8-Hour Emissions = ((Highest Peak Hour Concentration - Background 1-hour Concentration) x Persistence Factor) + Background 8-hour Concentration

	A.M. Peak Hour	P.M. Peak Hour	8-Hour
25 Feet from Roadway Edge	3.6	3.4	2.0
50 Feet from Roadway Edge	3.5	3.3	1.9
100 Feet from Roadway Edge	3.3	3.2	1.8

<sup>2</sup> Methodology from Bay Area Air Quality Management District *BAAQMD CEQA Guidelines* (1996).

# SIMPLIFIED CALINE4 CARBON MONOXIDE ANALYSIS

**Project Number:** 10953-00  
**Project Title:** City of Lake Forest Opportunities Study Program EIR

## Background Information

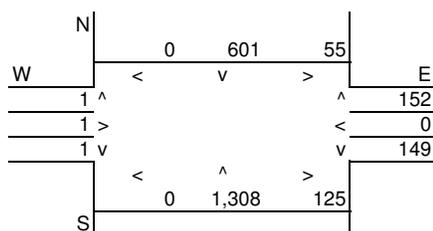
Nearest Air Monitoring Station measuring CO: Mission Viejo - 26081 Via Pera  
 Background 1-hour CO Concentration (ppm): 3.0  
 Background 8-hour CO Concentration (ppm): 1.5  
 Persistence Factor: 0.8  
 Analysis Year: 2030

## Roadway Data

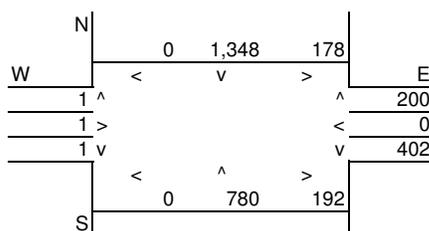
Intersection: Marine Wy at Rockfield  
 Analysis Condition: Year 2030 Traffic Volumes - Existing General Plan

	Roadway Type	No. of Lanes	Average Speed		
			A.M.	P.M.	
North-South Roadway:	Marine Wy.	At Grade	6	20	20
East-West Roadway:	Rockfield	At Grade	4	20	20

### A.M. Peak Hour Traffic Volumes



### P.M. Peak Hour Traffic Volumes



### Highest Traffic Volumes (Vehicles per Hour)

N-S Road: 2,184                      N-S Road: 2,723  
 E-W Road: 482                        E-W Road: 973

## Roadway CO Contributions and Concentrations

Emissions = (A x B x C) / 100,000<sup>1</sup>

Roadway	A <sub>1</sub>	A <sub>2</sub>	A <sub>3</sub>	B	C	Estimated CO Concentrations		
	Reference CO Concentrations 25 Feet	50 Feet	100 Feet	Traffic Volume	Emission Factors <sup>2</sup>	25 Feet	50 Feet	100 Feet
<b>A.M. Peak Traffic Hour</b>								
North-South Road	6.1	4.9	3.5	2,184	1.09	0.15	0.12	0.08
East-West Road	2.6	2.2	1.7	482	1.09	0.01	0.01	0.01
<b>P.M. Peak Traffic Hour</b>								
North-South Road	6.1	4.9	3.5	2,723	1.09	0.18	0.15	0.10
East-West Road	2.6	2.2	1.7	973	1.09	0.03	0.02	0.02

<sup>1</sup> Methodology from Bay Area Air Quality Management District *BAAQMD CEQA Guidelines* (1996).

<sup>2</sup> Emission factors from EMFAC2002 (2003).

## Total Roadway CO Concentrations

Peak Hour Emissions = North-South Concentration + East-West Concentration + Background 1-hour Concentration<sup>2</sup>

8-Hour Emissions = ((Highest Peak Hour Concentration - Background 1-hour Concentration) x Persistence Factor) + Background 8-hour Concentration

	A.M. Peak Hour	P.M. Peak Hour	8-Hour
25 Feet from Roadway Edge	3.2	3.2	1.7
50 Feet from Roadway Edge	3.1	3.2	1.6
100 Feet from Roadway Edge	3.1	3.1	1.6

<sup>2</sup> Methodology from Bay Area Air Quality Management District *BAAQMD CEQA Guidelines* (1996).

# SIMPLIFIED CALINE4 CARBON MONOXIDE ANALYSIS

Project Number: 10953-00  
 Project Title: City of Lake Forest Opportunities Study Program EIR

## Background Information

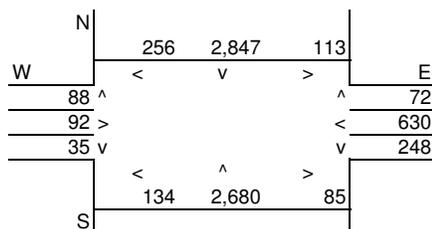
Nearest Air Monitoring Station measuring CO: Mission Viejo - 26081 Via Pera  
 Background 1-hour CO Concentration (ppm): 3.0  
 Background 8-hour CO Concentration (ppm): 1.5  
 Persistence Factor: 0.8  
 Analysis Year: 2030

## Roadway Data

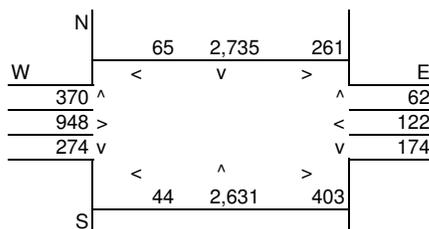
Intersection: Bake Pkwy at Muirlands  
 Analysis Condition: Year 2030 Traffic Volumes - Existing General Plan

	Roadway Type	No. of Lanes	Average Speed		
			A.M.	P.M.	
North-South Roadway:	Bake Pkwy.	At Grade	8	20	15
East-West Roadway:	Muirlands	At Grade	8	20	15

### A.M. Peak Hour Traffic Volumes



### P.M. Peak Hour Traffic Volumes



### Highest Traffic Volumes (Vehicles per Hour)

N-S Road: 6,056	N-S Road: 6,261
E-W Road: 1,240	E-W Road: 1,970

## Roadway CO Contributions and Concentrations

$$\text{Emissions} = (A \times B \times C) / 100,000^1$$

Roadway	A <sub>1</sub>	A <sub>2</sub>	A <sub>3</sub>	B	C	Estimated CO Concentrations		
	Reference CO Concentrations 25 Feet	50 Feet	100 Feet	Traffic Volume	Emission Factors <sup>2</sup>	25 Feet	50 Feet	100 Feet
<b>A.M. Peak Traffic Hour</b>								
North-South Road	5.7	4.6	3.4	6,056	1.09	0.38	0.30	0.22
East-West Road	2.2	1.9	1.6	1,240	1.09	0.03	0.03	0.02
<b>P.M. Peak Traffic Hour</b>								
North-South Road	5.7	4.6	3.4	6,261	1.23	0.44	0.35	0.26
East-West Road	2.2	1.9	1.6	1,970	1.23	0.05	0.05	0.04

<sup>1</sup> Methodology from Bay Area Air Quality Management District *BAAQMD CEQA Guidelines* (1996).

<sup>2</sup> Emission factors from EMFAC2002 (2003).

## Total Roadway CO Concentrations

$$\text{Peak Hour Emissions} = \text{North-South Concentration} + \text{East-West Concentration} + \text{Background 1-hour Concentration}^2$$

$$\text{8-Hour Emissions} = ((\text{Highest Peak Hour Concentration} - \text{Background 1-hour Concentration}) \times \text{Persistence Factor}) + \text{Background 8-hour Concentration}$$

	A.M. Peak Hour	P.M. Peak Hour	8-Hour
25 Feet from Roadway Edge	3.4	3.5	1.9
50 Feet from Roadway Edge	3.3	3.4	1.8
100 Feet from Roadway Edge	3.2	3.3	1.7

<sup>2</sup> Methodology from Bay Area Air Quality Management District *BAAQMD CEQA Guidelines* (1996).

# SIMPLIFIED CALINE4 CARBON MONOXIDE ANALYSIS

Project Number: 10953-00  
 Project Title: City of Lake Forest Opportunities Study Program EIR

## Background Information

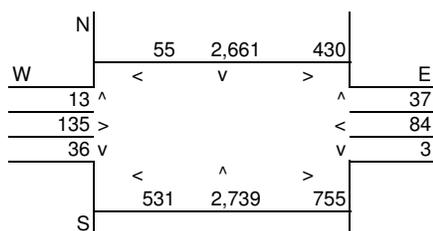
Nearest Air Monitoring Station measuring CO: Mission Viejo - 26081 Via Pera  
 Background 1-hour CO Concentration (ppm): 3.0  
 Background 8-hour CO Concentration (ppm): 1.5  
 Persistence Factor: 0.8  
 Analysis Year: 2030

## Roadway Data

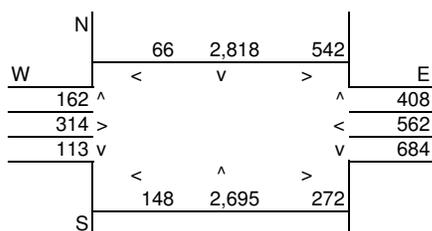
Intersection: Bake Pkwy at Rockfield Bl  
 Analysis Condition: Year 2030 Traffic Volumes - Existing General Plan

	Roadway Type	No. of Lanes	Average Speed		
			A.M.	P.M.	
North-South Roadway:	Bake Pkwy.	At Grade	8	20	15
East-West Roadway:	Rockfield Bl.	At Grade	8	20	15

### A.M. Peak Hour Traffic Volumes



### P.M. Peak Hour Traffic Volumes



### Highest Traffic Volumes (Vehicles per Hour)

N-S Road: 6,725                      N-S Road: 6,730  
 E-W Road: 1,444                      E-W Road: 2,782

## Roadway CO Contributions and Concentrations

Emissions = (A x B x C) / 100,000<sup>1</sup>

Roadway	A <sub>1</sub>	A <sub>2</sub>	A <sub>3</sub>	B	C	Estimated CO Concentrations		
	Reference CO Concentrations 25 Feet	50 Feet	100 Feet	Traffic Volume	Emission Factors <sup>2</sup>	25 Feet	50 Feet	100 Feet
A.M. Peak Traffic Hour								
North-South Road	5.7	4.6	3.4	6,725	1.09	0.42	0.34	0.25
East-West Road	2.2	1.9	1.6	1,444	1.09	0.03	0.03	0.03
P.M. Peak Traffic Hour								
North-South Road	5.7	4.6	3.4	6,730	1.23	0.47	0.38	0.28
East-West Road	2.2	1.9	1.6	2,782	1.23	0.08	0.07	0.05

<sup>1</sup> Methodology from Bay Area Air Quality Management District *BAAQMD CEQA Guidelines* (1996).

<sup>2</sup> Emission factors from EMFAC2002 (2003).

## Total Roadway CO Concentrations

Peak Hour Emissions = North-South Concentration + East-West Concentration + Background 1-hour Concentration<sup>2</sup>

8-Hour Emissions = ((Highest Peak Hour Concentration - Background 1-hour Concentration) x Persistence Factor) + Background 8-hour Concentration

	A.M. Peak Hour	P.M. Peak Hour	8-Hour
25 Feet from Roadway Edge	3.5	3.5	1.9
50 Feet from Roadway Edge	3.4	3.4	1.9
100 Feet from Roadway Edge	3.3	3.3	1.8

<sup>2</sup> Methodology from Bay Area Air Quality Management District *BAAQMD CEQA Guidelines* (1996).

# SIMPLIFIED CALINE4 CARBON MONOXIDE ANALYSIS

**Project Number:** 10953-00  
**Project Title:** City of Lake Forest Opportunities Study Program EIR

## Background Information

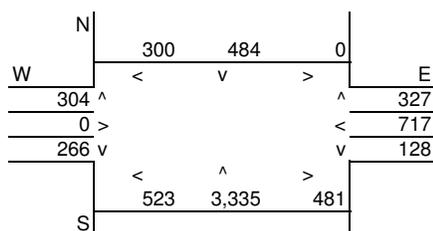
Nearest Air Monitoring Station measuring CO: Mission Viejo - 26081 Via Pera  
 Background 1-hour CO Concentration (ppm): 3.0  
 Background 8-hour CO Concentration (ppm): 1.5  
 Persistence Factor: 0.8  
 Analysis Year: 2030

## Roadway Data

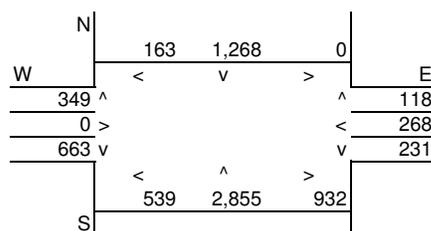
Intersection: Bake Pkwy at I-5 NB Ramps  
 Analysis Condition: Year 2030 Traffic Volumes - Existing General Plan

	Roadway Type	No. of Lanes	Average Speed		
			A.M.	P.M.	
North-South Roadway:	Bake Pkwy.	At Grade	8	10	10
East-West Roadway:	I-5 NB Ramps	At Grade	8	10	10

### A.M. Peak Hour Traffic Volumes



### P.M. Peak Hour Traffic Volumes



### Highest Traffic Volumes (Vehicles per Hour)

N-S Road: 5,217                      N-S Road: 6,488  
 E-W Road: 2,110                    E-W Road: 1,982

## Roadway CO Contributions and Concentrations

Emissions = (A x B x C) / 100,000<sup>1</sup>

Roadway	A <sub>1</sub>	A <sub>2</sub>	A <sub>3</sub>	B	C	Estimated CO Concentrations		
	Reference CO Concentrations 25 Feet	50 Feet	100 Feet	Traffic Volume	Emission Factors <sup>2</sup>	25 Feet	50 Feet	100 Feet
<b>A.M. Peak Traffic Hour</b>								
North-South Road	5.7	4.6	3.4	5,217	1.41	0.42	0.34	0.25
East-West Road	2.2	1.9	1.6	2,110	1.41	0.07	0.06	0.05
<b>P.M. Peak Traffic Hour</b>								
North-South Road	5.7	4.6	3.4	6,488	1.41	0.52	0.42	0.31
East-West Road	2.2	1.9	1.6	1,982	1.41	0.06	0.05	0.04

<sup>1</sup> Methodology from Bay Area Air Quality Management District *BAAQMD CEQA Guidelines* (1996).

<sup>2</sup> Emission factors from EMFAC2002 (2003).

## Total Roadway CO Concentrations

Peak Hour Emissions = North-South Concentration + East-West Concentration + Background 1-hour Concentration<sup>2</sup>

8-Hour Emissions = ((Highest Peak Hour Concentration - Background 1-hour Concentration) x Persistence Factor) + Background 8-hour Concentration

	A.M. Peak Hour	P.M. Peak Hour	8-Hour
25 Feet from Roadway Edge	3.5	3.6	2.0
50 Feet from Roadway Edge	3.4	3.5	1.9
100 Feet from Roadway Edge	3.3	3.4	1.8

<sup>2</sup> Methodology from Bay Area Air Quality Management District *BAAQMD CEQA Guidelines* (1996).

# SIMPLIFIED CALINE4 CARBON MONOXIDE ANALYSIS

Project Number: 10953-00  
 Project Title: City of Lake Forest Opportunities Study Program EIR

## Background Information

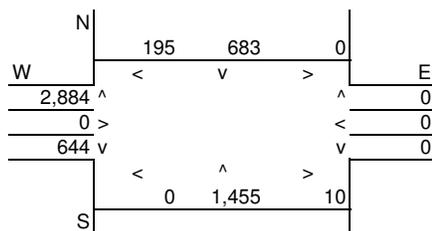
Nearest Air Monitoring Station measuring CO: Mission Viejo - 26081 Via Pera  
 Background 1-hour CO Concentration (ppm): 3.0  
 Background 8-hour CO Concentration (ppm): 1.5  
 Persistence Factor: 0.8  
 Analysis Year: 2030

## Roadway Data

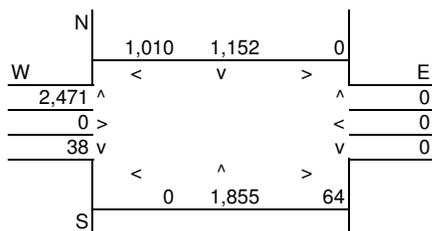
Intersection: Bake Pkwy at I-5 SB Ramps  
 Analysis Condition: Year 2030 Traffic Volumes - Existing General Plan

	Roadway Type	No. of Lanes	Average Speed		
			A.M.	P.M.	
North-South Roadway:	Bake Pkwy.	At Grade	6	10	15
East-West Roadway:	I-5 SB Ramps	At Grade	4	10	15

### A.M. Peak Hour Traffic Volumes



### P.M. Peak Hour Traffic Volumes



### Highest Traffic Volumes (Vehicles per Hour)

N-S Road: 5,217                      N-S Road: 6,488  
 E-W Road: 3,723                      E-W Road: 3,519

## Roadway CO Contributions and Concentrations

Emissions = (A x B x C) / 100,000<sup>1</sup>

Roadway	A <sub>1</sub>	A <sub>2</sub>	A <sub>3</sub>	B	C	Estimated CO Concentrations		
	Reference CO Concentrations 25 Feet	50 Feet	100 Feet	Traffic Volume	Emission Factors <sup>2</sup>	25 Feet	50 Feet	100 Feet
A.M. Peak Traffic Hour								
North-South Road	6.1	4.9	3.5	5,217	1.41	0.45	0.36	0.26
East-West Road	2.6	2.2	1.7	3,723	1.41	0.14	0.12	0.09
P.M. Peak Traffic Hour								
North-South Road	6.1	4.9	3.5	6,488	1.23	0.49	0.39	0.28
East-West Road	2.6	2.2	1.7	3,519	1.23	0.11	0.10	0.07

<sup>1</sup> Methodology from Bay Area Air Quality Management District *BAAQMD CEQA Guidelines* (1996).

<sup>2</sup> Emission factors from EMFAC2002 (2003).

## Total Roadway CO Concentrations

Peak Hour Emissions = North-South Concentration + East-West Concentration + Background 1-hour Concentration<sup>2</sup>

8-Hour Emissions = ((Highest Peak Hour Concentration - Background 1-hour Concentration) x Persistence Factor) + Background 8-hour Concentration

	A.M. Peak Hour	P.M. Peak Hour	8-Hour
25 Feet from Roadway Edge	3.6	3.6	2.0
50 Feet from Roadway Edge	3.5	3.5	1.9
100 Feet from Roadway Edge	3.3	3.4	1.8

<sup>2</sup> Methodology from Bay Area Air Quality Management District *BAAQMD CEQA Guidelines* (1996).

# SIMPLIFIED CALINE4 CARBON MONOXIDE ANALYSIS

Project Number: 10953-00  
 Project Title: City of Lake Forest Opportunities Study Program EIR

## Background Information

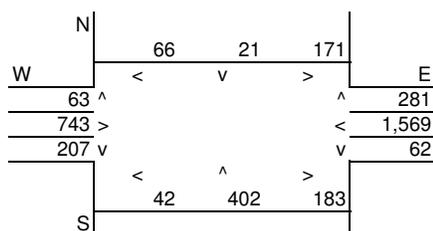
Nearest Air Monitoring Station measuring CO: Mission Viejo - 26081 Via Pera  
 Background 1-hour CO Concentration (ppm): 3.0  
 Background 8-hour CO Concentration (ppm): 1.5  
 Persistence Factor: 0.8  
 Analysis Year: 2030

## Roadway Data

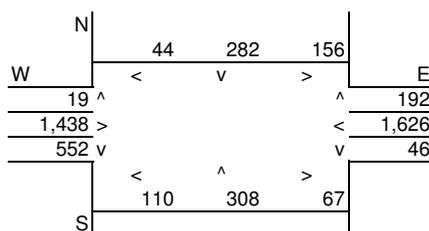
Intersection: Bake Pkwy at Irvine Center Dr.  
 Analysis Condition: Year 2030 Traffic Volumes - Existing General Plan

	Roadway Type	No. of Lanes	Average Speed		
			A.M.	P.M.	
North-South Roadway:	Bake Pkwy.	At Grade	8	20	20
East-West Roadway:	Irvine Center Dr.	At Grade	8	20	20

### A.M. Peak Hour Traffic Volumes



### P.M. Peak Hour Traffic Volumes



### Highest Traffic Volumes (Vehicles per Hour)

N-S Road: 1,004                      N-S Road: 1,365  
 E-W Road: 3,009                    E-W Road: 3,789

## Roadway CO Contributions and Concentrations

Emissions = (A x B x C) / 100,000<sup>1</sup>

Roadway	Reference CO Concentrations			B Traffic Volume	C Emission Factors <sup>2</sup>	Estimated CO Concentrations		
	A <sub>1</sub> 25 Feet	A <sub>2</sub> 50 Feet	A <sub>3</sub> 100 Feet			25 Feet	50 Feet	100 Feet
A.M. Peak Traffic Hour								
North-South Road	2.2	1.9	1.6	1,004	1.09	0.02	0.02	0.02
East-West Road	5.7	4.6	3.4	3,009	1.09	0.19	0.15	0.11
P.M. Peak Traffic Hour								
North-South Road	2.2	1.9	1.6	1,365	1.09	0.03	0.03	0.02
East-West Road	5.7	4.6	3.4	3,789	1.09	0.24	0.19	0.14

<sup>1</sup> Methodology from Bay Area Air Quality Management District *BAAQMD CEQA Guidelines* (1996).

<sup>2</sup> Emission factors from EMFAC2002 (2003).

## Total Roadway CO Concentrations

Peak Hour Emissions = North-South Concentration + East-West Concentration + Background 1-hour Concentration<sup>2</sup>

8-Hour Emissions = ((Highest Peak Hour Concentration - Background 1-hour Concentration) x Persistence Factor) + Background 8-hour Concentration

	A.M. Peak Hour	P.M. Peak Hour	8-Hour
25 Feet from Roadway Edge	3.2	3.3	1.7
50 Feet from Roadway Edge	3.2	3.2	1.7
100 Feet from Roadway Edge	3.1	3.2	1.6

<sup>2</sup> Methodology from Bay Area Air Quality Management District *BAAQMD CEQA Guidelines* (1996).

# SIMPLIFIED CALINE4 CARBON MONOXIDE ANALYSIS

**Project Number:** 10953-00  
**Project Title:** City of Lake Forest Opportunities Study Program EIR

## Background Information

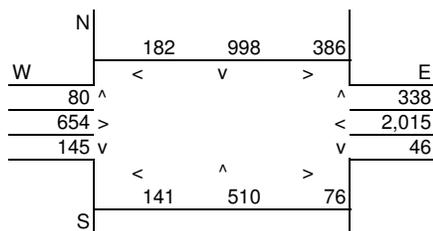
Nearest Air Monitoring Station measuring CO: Mission Viejo - 26081 Via Pera  
 Background 1-hour CO Concentration (ppm): 3.0  
 Background 8-hour CO Concentration (ppm): 1.5  
 Persistence Factor: 0.8  
 Analysis Year: 2030

## Roadway Data

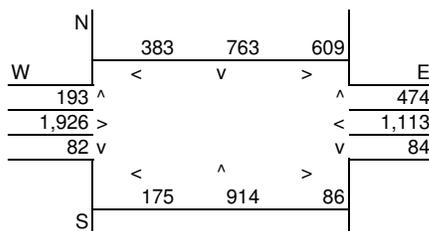
Intersection: Lake Forest Dr. at Irvine Center Dr.  
 Analysis Condition: Year 2030 Traffic Volumes - Existing General Plan

	Roadway Type	No. of Lanes	Average Speed		
			A.M.	P.M.	
North-South Roadway:	Lake Forest Dr.	At Grade	8	20	15
East-West Roadway:	Irvine Center Dr.	At Grade	8	20	15

### A.M. Peak Hour Traffic Volumes



### P.M. Peak Hour Traffic Volumes



### Highest Traffic Volumes (Vehicles per Hour)

N-S Road: 2,494                      N-S Road: 3,336  
 E-W Road: 3,515                      E-W Road: 4,292

## Roadway CO Contributions and Concentrations

Emissions = (A x B x C) / 100,000<sup>1</sup>

Roadway	A <sub>1</sub>	A <sub>2</sub>	A <sub>3</sub>	B	C	Estimated CO Concentrations		
	Reference CO Concentrations 25 Feet	50 Feet	100 Feet	Traffic Volume	Emission Factors <sup>2</sup>	25 Feet	50 Feet	100 Feet
<b>A.M. Peak Traffic Hour</b>								
North-South Road	2.2	1.9	1.6	2,494	1.09	0.06	0.05	0.04
East-West Road	5.7	4.6	3.4	3,515	1.09	0.22	0.18	0.13
<b>P.M. Peak Traffic Hour</b>								
North-South Road	2.2	1.9	1.6	3,336	1.23	0.09	0.08	0.07
East-West Road	5.7	4.6	3.4	4,292	1.23	0.30	0.24	0.18

<sup>1</sup> Methodology from Bay Area Air Quality Management District *BAAQMD CEQA Guidelines* (1996).

<sup>2</sup> Emission factors from EMFAC2002 (2003).

## Total Roadway CO Concentrations

Peak Hour Emissions = North-South Concentration + East-West Concentration + Background 1-hour Concentration<sup>2</sup>

8-Hour Emissions = ((Highest Peak Hour Concentration - Background 1-hour Concentration) x Persistence Factor) + Background 8-hour Concentration

	A.M. Peak Hour	P.M. Peak Hour	8-Hour
25 Feet from Roadway Edge	3.3	3.4	1.8
50 Feet from Roadway Edge	3.2	3.3	1.8
100 Feet from Roadway Edge	3.2	3.2	1.7

<sup>2</sup> Methodology from Bay Area Air Quality Management District *BAAQMD CEQA Guidelines* (1996).

# SIMPLIFIED CALINE4 CARBON MONOXIDE ANALYSIS

Project Number: 10953-00  
 Project Title: City of Lake Forest Opportunities Study Program EIR

## Background Information

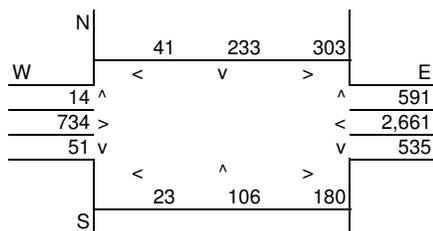
Nearest Air Monitoring Station measuring CO: Mission Viejo - 26081 Via Pera  
 Background 1-hour CO Concentration (ppm): 3.0  
 Background 8-hour CO Concentration (ppm): 1.5  
 Persistence Factor: 0.8  
 Analysis Year: 2030

## Roadway Data

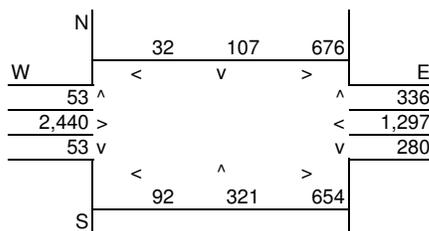
Intersection: Ridge Route at Mountain Pkwy.  
 Analysis Condition: Year 2030 Traffic Volumes - Existing General Plan

	Roadway Type	No. of Lanes	Average Speed		
			A.M.	P.M.	
North-South Roadway:	Ridge Route	At Grade	8	20	5
East-West Roadway:	Mountain Pkwy.	At Grade	8	20	5

### A.M. Peak Hour Traffic Volumes



### P.M. Peak Hour Traffic Volumes



### Highest Traffic Volumes (Vehicles per Hour)

N-S Road: 1,288      N-S Road: 1,525  
 E-W Road: 5,004      E-W Road: 5,683

## Roadway CO Contributions and Concentrations

Emissions = (A x B x C) / 100,000<sup>1</sup>

Roadway	A <sub>1</sub>	A <sub>2</sub>	A <sub>3</sub>	B	C	Estimated CO Concentrations		
	Reference CO Concentrations 25 Feet	50 Feet	100 Feet	Traffic Volume	Emission Factors <sup>2</sup>	25 Feet	50 Feet	100 Feet
A.M. Peak Traffic Hour								
North-South Road	2.2	1.9	1.6	1,288	1.09	0.03	0.03	0.02
East-West Road	5.7	4.6	3.4	5,004	1.09	0.31	0.25	0.19
P.M. Peak Traffic Hour								
North-South Road	2.2	1.9	1.6	1,525	1.65	0.06	0.05	0.04
East-West Road	5.7	4.6	3.4	5,683	1.65	0.53	0.43	0.32

<sup>1</sup> Methodology from Bay Area Air Quality Management District *BAAQMD CEQA Guidelines* (1996).

<sup>2</sup> Emission factors from EMFAC2002 (2003).

## Total Roadway CO Concentrations

Peak Hour Emissions = North-South Concentration + East-West Concentration + Background 1-hour Concentration<sup>2</sup>

8-Hour Emissions = ((Highest Peak Hour Concentration - Background 1-hour Concentration) x Persistence Factor) + Background 8-hour Concentration

	A.M. Peak Hour	P.M. Peak Hour	8-Hour
25 Feet from Roadway Edge	3.3	3.6	2.0
50 Feet from Roadway Edge	3.3	3.5	1.9
100 Feet from Roadway Edge	3.2	3.4	1.8

<sup>2</sup> Methodology from Bay Area Air Quality Management District *BAAQMD CEQA Guidelines* (1996).

# SIMPLIFIED CALINE4 CARBON MONOXIDE ANALYSIS

Project Number: 10953-00  
 Project Title: City of Lake Forest Opportunities Study Program EIR

## Background Information

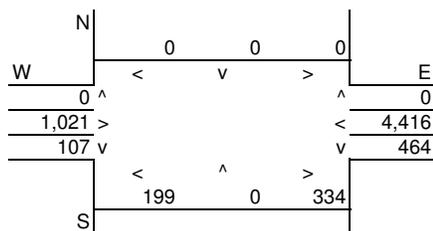
Nearest Air Monitoring Station measuring CO: Mission Viejo - 26081 Via Pera  
 Background 1-hour CO Concentration (ppm): 3.0  
 Background 8-hour CO Concentration (ppm): 1.5  
 Persistence Factor: 0.8  
 Analysis Year: 2030

## Roadway Data

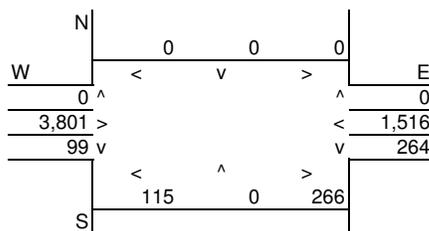
Intersection: Santa Maria Ave. at Moulton Pkwy.  
 Analysis Condition: Year 2030 Traffic Volumes - Existing General Plan

	Roadway Type	No. of Lanes	Average Speed		
			A.M.	P.M.	
North-South Roadway:	Santa Maria Ave.	At Grade	4	10	10
East-West Roadway:	Moulton Pkwy.	At Grade	8	10	10

### A.M. Peak Hour Traffic Volumes



### P.M. Peak Hour Traffic Volumes



### Highest Traffic Volumes (Vehicles per Hour)

N-S Road:	1,104	N-S Road:	744
E-W Road:	6,235	E-W Road:	5,847

## Roadway CO Contributions and Concentrations

$$\text{Emissions} = (A \times B \times C) / 100,000^1$$

Roadway	A <sub>1</sub>	A <sub>2</sub>	A <sub>3</sub>	B	C	Estimated CO Concentrations		
	Reference CO Concentrations 25 Feet	50 Feet	100 Feet	Traffic Volume	Emission Factors <sup>2</sup>	25 Feet	50 Feet	100 Feet
<b>A.M. Peak Traffic Hour</b>								
North-South Road	2.6	2.2	1.7	1,104	1.41	0.04	0.03	0.03
East-West Road	5.7	4.6	3.4	6,235	1.41	0.50	0.40	0.30
<b>P.M. Peak Traffic Hour</b>								
North-South Road	2.6	2.2	1.7	744	1.41	0.03	0.02	0.02
East-West Road	5.7	4.6	3.4	5,847	1.41	0.47	0.38	0.28

<sup>1</sup> Methodology from Bay Area Air Quality Management District *BAAQMD CEQA Guidelines* (1996).

<sup>2</sup> Emission factors from EMFAC2002 (2003).

## Total Roadway CO Concentrations

$$\text{Peak Hour Emissions} = \text{North-South Concentration} + \text{East-West Concentration} + \text{Background 1-hour Concentration}^2$$

$$\text{8-Hour Emissions} = ((\text{Highest Peak Hour Concentration} - \text{Background 1-hour Concentration}) \times \text{Persistence Factor}) + \text{Background 8-hour Concentration}$$

	A.M. Peak Hour	P.M. Peak Hour	8-Hour
25 Feet from Roadway Edge	3.5	3.5	1.9
50 Feet from Roadway Edge	3.4	3.4	1.9
100 Feet from Roadway Edge	3.3	3.3	1.8

<sup>2</sup> Methodology from Bay Area Air Quality Management District *BAAQMD CEQA Guidelines* (1996).

# SIMPLIFIED CALINE4 CARBON MONOXIDE ANALYSIS

Project Number: 10953-00  
 Project Title: City of Lake Forest Opportunities Study Program EIR

## Background Information

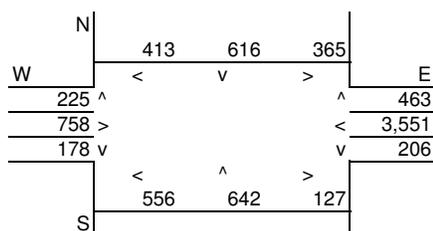
Nearest Air Monitoring Station measuring CO: Mission Viejo - 26081 Via Pera  
 Background 1-hour CO Concentration (ppm): 3.0  
 Background 8-hour CO Concentration (ppm): 1.5  
 Persistence Factor: 0.8  
 Analysis Year: 2030

## Roadway Data

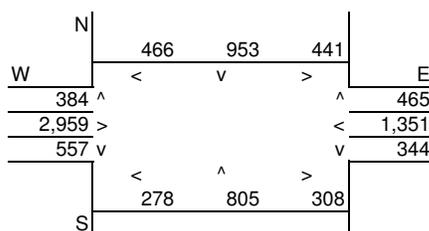
Intersection: El Toro Rd. at Moulton Pkwy.  
 Analysis Condition: Year 2030 Traffic Volumes - Existing General Plan

	Roadway Type	No. of Lanes	Average Speed		
			A.M.	P.M.	
North-South Roadway:	El Toro Rd.	At Grade	8	5	5
East-West Roadway:	Moulton Pkwy.	At Grade	8	5	5

### A.M. Peak Hour Traffic Volumes



### P.M. Peak Hour Traffic Volumes



### Highest Traffic Volumes (Vehicles per Hour)

N-S Road:	2,724	N-S Road:	3,514
E-W Road:	5,681	E-W Road:	5,995

## Roadway CO Contributions and Concentrations

$$\text{Emissions} = (A \times B \times C) / 100,000^1$$

Roadway	A <sub>1</sub>	A <sub>2</sub>	A <sub>3</sub>	B	C	Estimated CO Concentrations		
	Reference CO Concentrations 25 Feet	50 Feet	100 Feet	Traffic Volume	Emission Factors <sup>2</sup>	25 Feet	50 Feet	100 Feet
<b>A.M. Peak Traffic Hour</b>								
North-South Road	2.2	1.9	1.6	2,724	1.65	0.10	0.09	0.07
East-West Road	5.7	4.6	3.4	5,681	1.65	0.53	0.43	0.32
<b>P.M. Peak Traffic Hour</b>								
North-South Road	2.2	1.9	1.6	3,514	1.65	0.13	0.11	0.09
East-West Road	5.7	4.6	3.4	5,995	1.65	0.56	0.46	0.34

<sup>1</sup> Methodology from Bay Area Air Quality Management District *BAAQMD CEQA Guidelines* (1996).

<sup>2</sup> Emission factors from EMFAC2002 (2003).

## Total Roadway CO Concentrations

$$\text{Peak Hour Emissions} = \text{North-South Concentration} + \text{East-West Concentration} + \text{Background 1-hour Concentration}^2$$

$$\text{8-Hour Emissions} = ((\text{Highest Peak Hour Concentration} - \text{Background 1-hour Concentration}) \times \text{Persistence Factor}) + \text{Background 8-hour Concentration}$$

	A.M. Peak Hour	P.M. Peak Hour	8-Hour
25 Feet from Roadway Edge	3.6	3.7	2.1
50 Feet from Roadway Edge	3.5	3.6	2.0
100 Feet from Roadway Edge	3.4	3.4	1.8

<sup>2</sup> Methodology from Bay Area Air Quality Management District *BAAQMD CEQA Guidelines* (1996).

# SIMPLIFIED CALINE4 CARBON MONOXIDE ANALYSIS

**Project Number:** 10953-00  
**Project Title:** City of Lake Forest Opportunities Study Program EIR

## Background Information

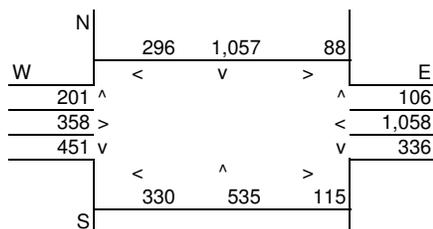
Nearest Air Monitoring Station measuring CO: Mission Viejo - 26081 Via Pera  
 Background 1-hour CO Concentration (ppm): 3.0  
 Background 8-hour CO Concentration (ppm): 1.5  
 Persistence Factor: 0.8  
 Analysis Year: 2030

## Roadway Data

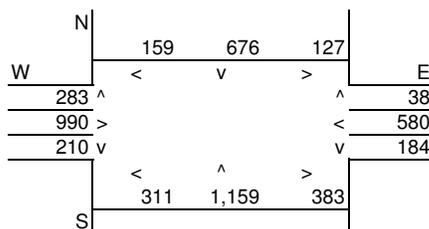
Intersection: Los Alisos Bl at Trabuco Rd  
 Analysis Condition: Year 2030 Traffic Volumes - Existing General Plan

	Roadway Type	No. of Lanes	Average Speed		
			A.M.	P.M.	
North-South Roadway:	Los Alisos Bl.	At Grade	8	10	20
East-West Roadway:	Trabuco Rd.	At Grade	8	10	20

### A.M. Peak Hour Traffic Volumes



### P.M. Peak Hour Traffic Volumes



### Highest Traffic Volumes (Vehicles per Hour)

N-S Road: 2,824                      N-S Road: 2,923  
 E-W Road: 2,694                      E-W Road: 2,533

## Roadway CO Contributions and Concentrations

Emissions = (A x B x C) / 100,000<sup>1</sup>

Roadway	A <sub>1</sub>	A <sub>2</sub>	A <sub>3</sub>	B	C	Estimated CO Concentrations		
	Reference CO Concentrations 25 Feet	50 Feet	100 Feet	Traffic Volume	Emission Factors <sup>2</sup>	25 Feet	50 Feet	100 Feet
<b>A.M. Peak Traffic Hour</b>								
North-South Road	5.7	4.6	3.4	2,824	1.41	0.23	0.18	0.14
East-West Road	2.2	1.9	1.6	2,694	1.41	0.08	0.07	0.06
<b>P.M. Peak Traffic Hour</b>								
North-South Road	5.7	4.6	3.4	2,923	1.09	0.18	0.15	0.11
East-West Road	2.2	1.9	1.6	2,533	1.09	0.06	0.05	0.04

<sup>1</sup> Methodology from Bay Area Air Quality Management District *BAAQMD CEQA Guidelines* (1996).

<sup>2</sup> Emission factors from EMFAC2002 (2003).

## Total Roadway CO Concentrations

Peak Hour Emissions = North-South Concentration + East-West Concentration + Background 1-hour Concentration<sup>2</sup>

8-Hour Emissions = ((Highest Peak Hour Concentration - Background 1-hour Concentration) x Persistence Factor) + Background 8-hour Concentration

	A.M. Peak Hour	P.M. Peak Hour	8-Hour
25 Feet from Roadway Edge	3.3	3.2	1.7
50 Feet from Roadway Edge	3.3	3.2	1.7
100 Feet from Roadway Edge	3.2	3.2	1.7

<sup>2</sup> Methodology from Bay Area Air Quality Management District *BAAQMD CEQA Guidelines* (1996).



# SIMPLIFIED CALINE4 CARBON MONOXIDE ANALYSIS

Project Number: 10953-00  
 Project Title: City of Lake Forest Opportunities Study Program EIR

## Background Information

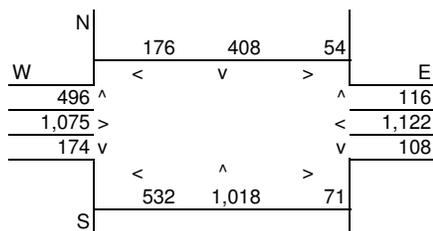
Nearest Air Monitoring Station measuring CO: Mission Viejo - 26081 Via Pera  
 Background 1-hour CO Concentration (ppm): 3.0  
 Background 8-hour CO Concentration (ppm): 1.5  
 Persistence Factor: 0.8  
 Analysis Year: 2030

## Roadway Data

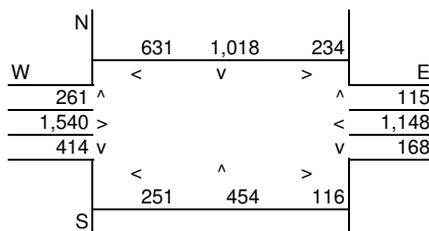
Intersection: Jeronimo Rd. at Alicia Pkwy.  
 Analysis Condition: Year 2030 Traffic Volumes - Existing General Plan

	Roadway Type	No. of Lanes	Average Speed		
			A.M.	P.M.	
North-South Roadway:	Jerónimo Rd.	At Grade	8	20	20
East-West Roadway:	Alicia Pkwy.	At Grade	8	20	20

### A.M. Peak Hour Traffic Volumes



### P.M. Peak Hour Traffic Volumes



### Highest Traffic Volumes (Vehicles per Hour)

A.M. Peak Hour:  
 N-S Road: 2,311  
 E-W Road: 3,575

P.M. Peak Hour:  
 N-S Road: 2,713  
 E-W Road: 4,245

## Roadway CO Contributions and Concentrations

$$\text{Emissions} = (A \times B \times C) / 100,000^1$$

Roadway	A <sub>1</sub>	A <sub>2</sub>	A <sub>3</sub>	B	C	Estimated CO Concentrations		
	Reference CO Concentrations 25 Feet	50 Feet	100 Feet	Traffic Volume	Emission Factors <sup>2</sup>	25 Feet	50 Feet	100 Feet
<b>A.M. Peak Traffic Hour</b>								
North-South Road	2.2	1.9	1.6	2,311	1.09	0.06	0.05	0.04
East-West Road	5.7	4.6	3.4	3,575	1.09	0.22	0.18	0.13
<b>P.M. Peak Traffic Hour</b>								
North-South Road	2.2	1.9	1.6	2,713	1.09	0.07	0.06	0.05
East-West Road	5.7	4.6	3.4	4,245	1.09	0.26	0.21	0.16

<sup>1</sup> Methodology from Bay Area Air Quality Management District *BAAQMD CEQA Guidelines* (1996).

<sup>2</sup> Emission factors from EMFAC2002 (2003).

## Total Roadway CO Concentrations

$$\text{Peak Hour Emissions} = \text{North-South Concentration} + \text{East-West Concentration} + \text{Background 1-hour Concentration}^2$$

$$\text{8-Hour Emissions} = ((\text{Highest Peak Hour Concentration} - \text{Background 1-hour Concentration}) \times \text{Persistence Factor}) + \text{Background 8-hour Concentration}$$

	A.M. Peak Hour	P.M. Peak Hour	8-Hour
25 Feet from Roadway Edge	3.3	3.3	1.8
50 Feet from Roadway Edge	3.2	3.3	1.7
100 Feet from Roadway Edge	3.2	3.2	1.7

<sup>2</sup> Methodology from Bay Area Air Quality Management District *BAAQMD CEQA Guidelines* (1996).

# SIMPLIFIED CALINE4 CARBON MONOXIDE ANALYSIS

Project Number: 10953-00  
 Project Title: City of Lake Forest Opportunities Study Program EIR

## Background Information

Nearest Air Monitoring Station measuring CO: Mission Viejo - 26081 Via Pera  
 Background 1-hour CO Concentration (ppm): 3.0  
 Background 8-hour CO Concentration (ppm): 1.5  
 Persistence Factor: 0.8  
 Analysis Year: 2030

## Roadway Data

Intersection: Alicia Pkwy at Muirlands Bl  
 Analysis Condition: Year 2030 Traffic Volumes - Existing General Plan

	Roadway Type	No. of Lanes	Average Speed		
			A.M.	P.M.	
North-South Roadway:	Alicia Pkwy.	At Grade	8	10	10
East-West Roadway:	Muirlands Bl.	At Grade	8	10	10

### A.M. Peak Hour Traffic Volumes

	N							
		97	2,140	147				
W	<		v	>				E
	98 ^							521 ^
	333 >							930 <
	518 v							242 v
		<	^	>				
		352	1,791	82				
	S							

### P.M. Peak Hour Traffic Volumes

	N							
		142	2,011	265				
W	<		v	>				E
	265 ^							305 ^
	880 >							574 <
	639 v							151 v
		<	^	>				
		553	2,251	245				
	S							

### Highest Traffic Volumes (Vehicles per Hour)

N-S Road:	5,125	N-S Road:	5,850
E-W Road:	2,328	E-W Road:	3,053

## Roadway CO Contributions and Concentrations

$$\text{Emissions} = (A \times B \times C) / 100,000^1$$

Roadway	A <sub>1</sub>	A <sub>2</sub>	A <sub>3</sub>	B	C	Estimated CO Concentrations		
	Reference CO Concentrations 25 Feet	50 Feet	100 Feet	Traffic Volume	Emission Factors <sup>2</sup>	25 Feet	50 Feet	100 Feet
A.M. Peak Traffic Hour								
North-South Road	5.7	4.6	3.4	5,125	1.41	0.41	0.33	0.25
East-West Road	2.2	1.9	1.6	2,328	1.41	0.07	0.06	0.05
P.M. Peak Traffic Hour								
North-South Road	5.7	4.6	3.4	5,850	1.41	0.47	0.38	0.28
East-West Road	2.2	1.9	1.6	3,053	1.41	0.09	0.08	0.07

<sup>1</sup> Methodology from Bay Area Air Quality Management District *BAAQMD CEQA Guidelines* (1996).

<sup>2</sup> Emission factors from EMFAC2002 (2003).

## Total Roadway CO Concentrations

$$\text{Peak Hour Emissions} = \text{North-South Concentration} + \text{East-West Concentration} + \text{Background 1-hour Concentration}^2$$

$$\text{8-Hour Emissions} = ((\text{Highest Peak Hour Concentration} - \text{Background 1-hour Concentration}) \times \text{Persistence Factor}) + \text{Background 8-hour Concentration}$$

	A.M. Peak Hour	P.M. Peak Hour	8-Hour
25 Feet from Roadway Edge	3.5	3.6	2.0
50 Feet from Roadway Edge	3.4	3.5	1.9
100 Feet from Roadway Edge	3.3	3.3	1.8

<sup>2</sup> Methodology from Bay Area Air Quality Management District *BAAQMD CEQA Guidelines* (1996).

# SIMPLIFIED CALINE4 CARBON MONOXIDE ANALYSIS

Project Number: 10953-00  
 Project Title: City of Lake Forest Opportunities Study Program EIR

## Background Information

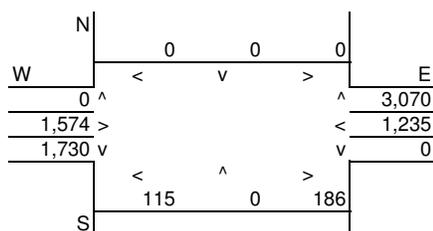
Nearest Air Monitoring Station measuring CO: Mission Viejo - 26081 Via Pera  
 Background 1-hour CO Concentration (ppm): 3.0  
 Background 8-hour CO Concentration (ppm): 1.5  
 Persistence Factor: 0.8  
 Analysis Year: 2030

## Roadway Data

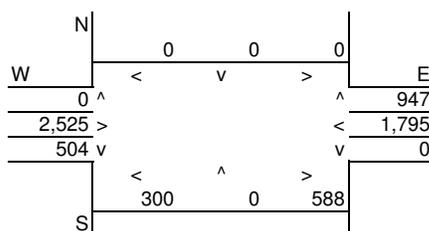
Intersection: I-5 NB Ramps at Alicia Pkwy.  
 Analysis Condition: Year 2030 Traffic Volumes - Existing General Plan

	Roadway Type	No. of Lanes	Average Speed	
			A.M.	P.M.
North-South Roadway:	I-5 NB Ramps	4	20	20
East-West Roadway:	Alicia Pkwy.	6	20	20

### A.M. Peak Hour Traffic Volumes



### P.M. Peak Hour Traffic Volumes



### Highest Traffic Volumes (Vehicles per Hour)

N-S Road: 3,070  
 E-W Road: 6,065  
 N-S Road: 1,392  
 E-W Road: 5,855

## Roadway CO Contributions and Concentrations

$$\text{Emissions} = (A \times B \times C) / 100,000^1$$

Roadway	A <sub>1</sub>	A <sub>2</sub>	A <sub>3</sub>	B	C	Estimated CO Concentrations		
	Reference CO Concentrations 25 Feet	50 Feet	100 Feet	Traffic Volume	Emission Factors <sup>2</sup>	25 Feet	50 Feet	100 Feet
A.M. Peak Traffic Hour								
North-South Road	2.6	2.2	1.7	3,070	1.09	0.09	0.07	0.06
East-West Road	6.1	4.9	3.5	6,065	1.09	0.40	0.32	0.23
P.M. Peak Traffic Hour								
North-South Road	2.6	2.2	1.7	1,392	1.09	0.04	0.03	0.03
East-West Road	6.1	4.9	3.5	5,855	1.09	0.39	0.31	0.22

<sup>1</sup> Methodology from Bay Area Air Quality Management District *BAAQMD CEQA Guidelines* (1996).

<sup>2</sup> Emission factors from EMFAC2002 (2003).

## Total Roadway CO Concentrations

$$\text{Peak Hour Emissions} = \text{North-South Concentration} + \text{East-West Concentration} + \text{Background 1-hour Concentration}^2$$

$$\text{8-Hour Emissions} = ((\text{Highest Peak Hour Concentration} - \text{Background 1-hour Concentration}) \times \text{Persistence Factor}) + \text{Background 8-hour Concentration}$$

	A.M. Peak Hour	P.M. Peak Hour	8-Hour
25 Feet from Roadway Edge	3.5	3.4	1.9
50 Feet from Roadway Edge	3.4	3.3	1.8
100 Feet from Roadway Edge	3.3	3.2	1.7

<sup>2</sup> Methodology from Bay Area Air Quality Management District *BAAQMD CEQA Guidelines* (1996).

# SIMPLIFIED CALINE4 CARBON MONOXIDE ANALYSIS

**Project Number:** 10953-00  
**Project Title:** City of Lake Forest Opportunities Study Program EIR

## Background Information

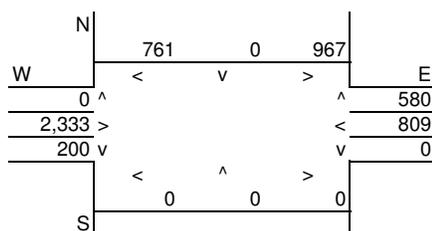
Nearest Air Monitoring Station measuring CO: Mission Viejo - 26081 Via Pera  
 Background 1-hour CO Concentration (ppm): 3.0  
 Background 8-hour CO Concentration (ppm): 1.5  
 Persistence Factor: 0.8  
 Analysis Year: 2030

## Roadway Data

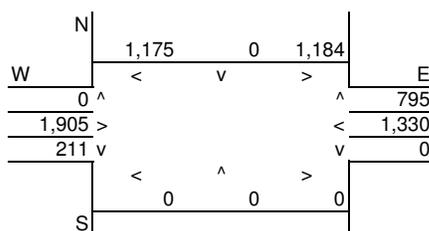
Intersection: I-5 SB Ramps at Alicia Pkwy.  
 Analysis Condition: Year 2030 Traffic Volumes - Existing General Plan

	Roadway Type	No. of Lanes	Average Speed	
			A.M.	P.M.
North-South Roadway:	I-5 SB Ramps	4	20	20
East-West Roadway:	Alicia Pkwy.	6	20	20

### A.M. Peak Hour Traffic Volumes



### P.M. Peak Hour Traffic Volumes



### Highest Traffic Volumes (Vehicles per Hour)

N-S Road:	2,308	N-S Road:	3,154
E-W Road:	4,689	E-W Road:	5,214

## Roadway CO Contributions and Concentrations

$$\text{Emissions} = (A \times B \times C) / 100,000^1$$

Roadway	A <sub>1</sub>	A <sub>2</sub>	A <sub>3</sub>	B	C	Estimated CO Concentrations		
	Reference CO Concentrations 25 Feet	50 Feet	100 Feet	Traffic Volume	Emission Factors <sup>2</sup>	25 Feet	50 Feet	100 Feet
<b>A.M. Peak Traffic Hour</b>								
North-South Road	2.6	2.2	1.7	2,308	1.09	0.07	0.06	0.04
East-West Road	6.1	4.9	3.5	4,689	1.09	0.31	0.25	0.18
<b>P.M. Peak Traffic Hour</b>								
North-South Road	2.6	2.2	1.7	3,154	1.09	0.09	0.08	0.06
East-West Road	6.1	4.9	3.5	5,214	1.09	0.35	0.28	0.20

<sup>1</sup> Methodology from Bay Area Air Quality Management District *BAAQMD CEQA Guidelines* (1996).

<sup>2</sup> Emission factors from EMFAC2002 (2003).

## Total Roadway CO Concentrations

$$\text{Peak Hour Emissions} = \text{North-South Concentration} + \text{East-West Concentration} + \text{Background 1-hour Concentration}^2$$

$$\text{8-Hour Emissions} = ((\text{Highest Peak Hour Concentration} - \text{Background 1-hour Concentration}) \times \text{Persistence Factor}) + \text{Background 8-hour Concentration}$$

	A.M. Peak Hour	P.M. Peak Hour	8-Hour
25 Feet from Roadway Edge	3.4	3.4	1.8
50 Feet from Roadway Edge	3.3	3.4	1.8
100 Feet from Roadway Edge	3.2	3.3	1.7

<sup>2</sup> Methodology from Bay Area Air Quality Management District *BAAQMD CEQA Guidelines* (1996).

# SIMPLIFIED CALINE4 CARBON MONOXIDE ANALYSIS

**Project Number:** 10953-00  
**Project Title:** City of Lake Forest Opportunities Study Program EIR

## Background Information

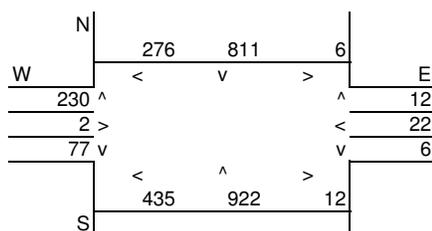
Nearest Air Monitoring Station measuring CO: Mission Viejo - 26081 Via Pera  
 Background 1-hour CO Concentration (ppm): 3.0  
 Background 8-hour CO Concentration (ppm): 1.5  
 Persistence Factor: 0.8  
 Analysis Year: 2030

## Roadway Data

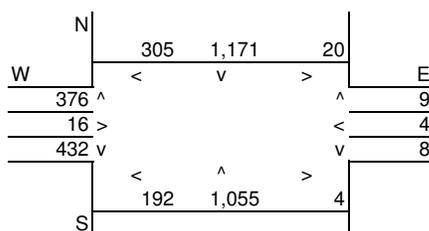
Intersection: Los Alisos Bl at Avd de la Carlota  
 Analysis Condition: Year 2030 Traffic Volumes - Existing General Plan

	Roadway Type	No. of Lanes	Average Speed		
			A.M.	P.M.	
North-South Roadway:	Los Alisos Bl.	At Grade	8	20	20
East-West Roadway:	Avd de la Carlota	At Grade	6	20	20

### A.M. Peak Hour Traffic Volumes



### P.M. Peak Hour Traffic Volumes



### Highest Traffic Volumes (Vehicles per Hour)

N-S Road:	2,263	N-S Road:	2,936
E-W Road:	1,042	E-W Road:	1,325

## Roadway CO Contributions and Concentrations

Emissions = (A x B x C) / 100,000<sup>1</sup>

Roadway	A <sub>1</sub>	A <sub>2</sub>	A <sub>3</sub>	B	C	Estimated CO Concentrations		
	Reference CO Concentrations 25 Feet	50 Feet	100 Feet	Traffic Volume	Emission Factors <sup>2</sup>	25 Feet	50 Feet	100 Feet
<b>A.M. Peak Traffic Hour</b>								
North-South Road	5.7	4.6	3.4	2,263	1.09	0.14	0.11	0.08
East-West Road	2.3	2.0	1.7	1,042	1.09	0.03	0.02	0.02
<b>P.M. Peak Traffic Hour</b>								
North-South Road	5.7	4.6	3.4	2,936	1.09	0.18	0.15	0.11
East-West Road	2.3	2.0	1.7	1,325	1.09	0.03	0.03	0.02

<sup>1</sup> Methodology from Bay Area Air Quality Management District *BAAQMD CEQA Guidelines* (1996).

<sup>2</sup> Emission factors from EMFAC2002 (2003).

## Total Roadway CO Concentrations

Peak Hour Emissions = North-South Concentration + East-West Concentration + Background 1-hour Concentration<sup>2</sup>

8-Hour Emissions = ((Highest Peak Hour Concentration - Background 1-hour Concentration) x Persistence Factor) + Background 8-hour Concentration

	A.M. Peak Hour	P.M. Peak Hour	8-Hour
25 Feet from Roadway Edge	3.2	3.2	1.7
50 Feet from Roadway Edge	3.1	3.2	1.6
100 Feet from Roadway Edge	3.1	3.1	1.6

<sup>2</sup> Methodology from Bay Area Air Quality Management District *BAAQMD CEQA Guidelines* (1996).

# SIMPLIFIED CALINE4 CARBON MONOXIDE ANALYSIS

Project Number: 10953-00  
 Project Title: City of Lake Forest Opportunities Study Program EIR

## Background Information

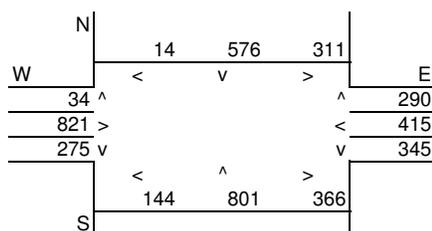
Nearest Air Monitoring Station measuring CO: Mission Viejo - 26081 Via Pera  
 Background 1-hour CO Concentration (ppm): 3.0  
 Background 8-hour CO Concentration (ppm): 1.5  
 Persistence Factor: 0.8  
 Analysis Year: 2030

## Roadway Data

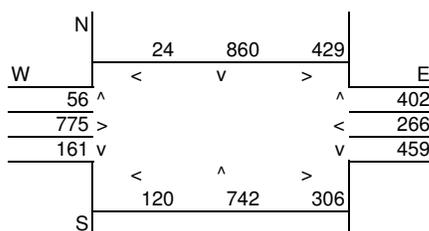
Intersection: El Toro Rd. at Paseo de Valencia  
 Analysis Condition: Year 2030 Traffic Volumes - Existing General Plan

	Roadway Type	No. of Lanes	Average Speed		
			A.M.	P.M.	
North-South Roadway:	El Toro Rd.	At Grade	8	20	20
East-West Roadway:	Paseo de Valencia	At Grade	8	20	20

### A.M. Peak Hour Traffic Volumes



### P.M. Peak Hour Traffic Volumes



### Highest Traffic Volumes (Vehicles per Hour)

N-S Road: 2,507	N-S Road: 2,648
E-W Road: 2,548	E-W Road: 2,637

## Roadway CO Contributions and Concentrations

$$\text{Emissions} = (A \times B \times C) / 100,000^1$$

Roadway	A <sub>1</sub>	A <sub>2</sub>	A <sub>3</sub>	B	C	Estimated CO Concentrations			
	Reference CO Concentrations	25 Feet	50 Feet	100 Feet	Traffic Volume	Emission Factors <sup>2</sup>	25 Feet	50 Feet	100 Feet
<b>A.M. Peak Traffic Hour</b>									
North-South Road	2.2	1.9	1.6	2,507	1.09	0.06	0.05	0.04	
East-West Road	5.7	4.6	3.4	2,548	1.09	0.16	0.13	0.09	
<b>P.M. Peak Traffic Hour</b>									
North-South Road	5.7	4.6	3.4	2,648	1.09	0.16	0.13	0.10	
East-West Road	2.2	1.9	1.6	2,637	1.09	0.06	0.05	0.05	

<sup>1</sup> Methodology from Bay Area Air Quality Management District *BAAQMD CEQA Guidelines* (1996).

<sup>2</sup> Emission factors from EMFAC2002 (2003).

## Total Roadway CO Concentrations

$$\text{Peak Hour Emissions} = \text{North-South Concentration} + \text{East-West Concentration} + \text{Background 1-hour Concentration}^2$$

$$\text{8-Hour Emissions} = ((\text{Highest Peak Hour Concentration} - \text{Background 1-hour Concentration}) \times \text{Persistence Factor}) + \text{Background 8-hour Concentration}$$

	A.M. Peak Hour	P.M. Peak Hour	8-Hour
25 Feet from Roadway Edge	3.2	3.2	1.7
50 Feet from Roadway Edge	3.2	3.2	1.6
100 Feet from Roadway Edge	3.1	3.1	1.6

<sup>2</sup> Methodology from Bay Area Air Quality Management District *BAAQMD CEQA Guidelines* (1996).

# SIMPLIFIED CALINE4 CARBON MONOXIDE ANALYSIS

Project Number: 10953-00  
 Project Title: City of Lake Forest Opportunities Study Program EIR

## Background Information

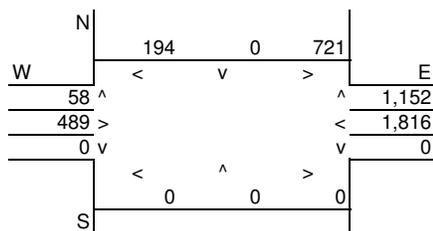
Nearest Air Monitoring Station measuring CO: Mission Viejo - 26081 Via Pera  
 Background 1-hour CO Concentration (ppm): 3.0  
 Background 8-hour CO Concentration (ppm): 1.5  
 Persistence Factor: 0.8  
 Analysis Year: 2030

## Roadway Data

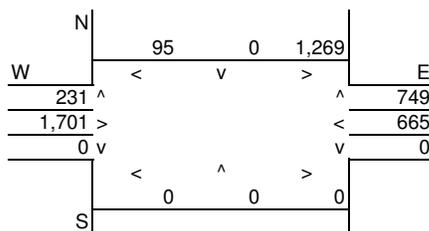
Intersection: Los Alisos Bl at Paseo de Valencia  
 Analysis Condition: Year 2030 Traffic Volumes - Existing General Plan

	Roadway Type	No. of Lanes	Average Speed		
			A.M.	P.M.	
North-South Roadway:	Los Alisos Bl.	At Grade	4	20	20
East-West Roadway:	Paseo de Valencia	At Grade	8	20	20

### A.M. Peak Hour Traffic Volumes



### P.M. Peak Hour Traffic Volumes



### Highest Traffic Volumes (Vehicles per Hour)

N-S Road: 2,125                      N-S Road: 2,344  
 E-W Road: 4,178                    E-W Road: 4,384

## Roadway CO Contributions and Concentrations

Emissions = (A x B x C) / 100,000<sup>1</sup>

Roadway	A <sub>1</sub>	A <sub>2</sub>	A <sub>3</sub>	B	C	Estimated CO Concentrations		
	Reference CO Concentrations 25 Feet	50 Feet	100 Feet	Traffic Volume	Emission Factors <sup>2</sup>	25 Feet	50 Feet	100 Feet
A.M. Peak Traffic Hour								
North-South Road	2.6	2.2	1.7	2,125	1.09	0.06	0.05	0.04
East-West Road	5.7	4.6	3.4	4,178	1.09	0.26	0.21	0.15
P.M. Peak Traffic Hour								
North-South Road	2.6	2.2	1.7	2,344	1.09	0.07	0.06	0.04
East-West Road	5.7	4.6	3.4	4,384	1.09	0.27	0.22	0.16

<sup>1</sup> Methodology from Bay Area Air Quality Management District *BAAQMD CEQA Guidelines* (1996).

<sup>2</sup> Emission factors from EMFAC2002 (2003).

## Total Roadway CO Concentrations

Peak Hour Emissions = North-South Concentration + East-West Concentration + Background 1-hour Concentration<sup>2</sup>

8-Hour Emissions = ((Highest Peak Hour Concentration - Background 1-hour Concentration) x Persistence Factor) + Background 8-hour Concentration

	A.M. Peak Hour	P.M. Peak Hour	8-Hour
25 Feet from Roadway Edge	3.3	3.3	1.8
50 Feet from Roadway Edge	3.3	3.3	1.7
100 Feet from Roadway Edge	3.2	3.2	1.7

<sup>2</sup> Methodology from Bay Area Air Quality Management District *BAAQMD CEQA Guidelines* (1996).

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**CO Analysis in Extended Study Area—Proposed Project Build-out**

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# SIMPLIFIED CALINE4 CARBON MONOXIDE ANALYSIS

**Project Number:** 10953-00  
**Project Title:** City of Lake Forest Opportunities Study Program EIR

## Background Information

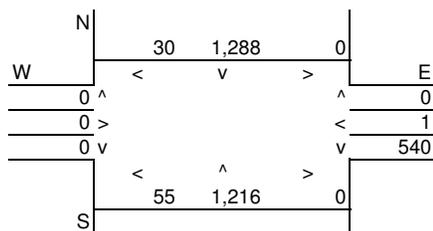
Nearest Air Monitoring Station measuring CO: Mission Viejo - 26081 Via Pera  
 Background 1-hour CO Concentration (ppm): 3.0  
 Background 8-hour CO Concentration (ppm): 1.5  
 Persistence Factor: 0.8  
 Analysis Year: 2030

## Roadway Data

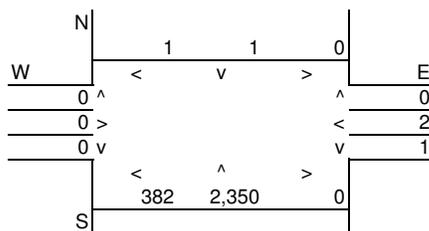
Intersection: Portola Pkwy at SR-241 NB Ramps  
 Analysis Condition: Year 2030 Traffic Volumes - Proposed Project

	Roadway Type	No. of Lanes	Average Speed		
			A.M.	P.M.	
North-South Roadway:	Portola Pkwy	At Grade	6	20	20
East-West Roadway:	SR-241 NB Ramps	At Grade	2	20	20

### A.M. Peak Hour Traffic Volumes



### P.M. Peak Hour Traffic Volumes



### Highest Traffic Volumes (Vehicles per Hour)

N-S Road:	3,099	N-S Road:	2,734
E-W Road:	541	E-W Road:	385

## Roadway CO Contributions and Concentrations

Emissions = (A x B x C) / 100,000<sup>1</sup>

Roadway	A <sub>1</sub>	A <sub>2</sub>	A <sub>3</sub>	B	C	Estimated CO Concentrations		
	Reference CO Concentrations 25 Feet	50 Feet	100 Feet	Traffic Volume	Emission Factors <sup>2</sup>	25 Feet	50 Feet	100 Feet
<b>A.M. Peak Traffic Hour</b>								
North-South Road	6.1	4.9	3.5	3,099	1.09	0.21	0.17	0.12
East-West Road	2.7	2.2	1.7	541	1.09	0.02	0.01	0.01
<b>P.M. Peak Traffic Hour</b>								
North-South Road	6.1	4.9	3.5	2,734	1.09	0.18	0.15	0.10
East-West Road	2.7	2.2	1.7	385	1.09	0.01	0.01	0.01

<sup>1</sup> Methodology from Bay Area Air Quality Management District *BAAQMD CEQA Guidelines* (1996).

<sup>2</sup> Emission factors from EMFAC2002 (2003).

## Total Roadway CO Concentrations

Peak Hour Emissions = North-South Concentration + East-West Concentration + Background 1-hour Concentration<sup>2</sup>

8-Hour Emissions = ((Highest Peak Hour Concentration - Background 1-hour Concentration) x Persistence Factor) + Background 8-hour Concentration

	A.M. Peak Hour	P.M. Peak Hour	8-Hour
25 Feet from Roadway Edge	3.2	3.2	1.7
50 Feet from Roadway Edge	3.2	3.2	1.6
100 Feet from Roadway Edge	3.1	3.1	1.6

<sup>2</sup> Methodology from Bay Area Air Quality Management District *BAAQMD CEQA Guidelines* (1996).

# SIMPLIFIED CALINE4 CARBON MONOXIDE ANALYSIS

Project Number: 10953-00  
 Project Title: City of Lake Forest Opportunities Study Program EIR

## Background Information

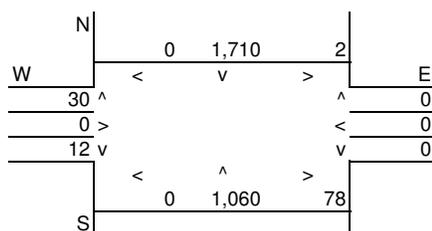
Nearest Air Monitoring Station measuring CO: Mission Viejo - 26081 Via Pera  
 Background 1-hour CO Concentration (ppm): 3.0  
 Background 8-hour CO Concentration (ppm): 1.5  
 Persistence Factor: 0.8  
 Analysis Year: 2030

## Roadway Data

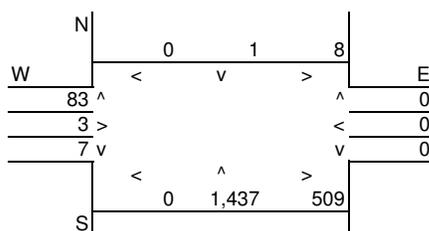
Intersection: Portola Pkwy at SR-241 SB Ramps  
 Analysis Condition: Year 2030 Traffic Volumes - Proposed Project

	Roadway Type	No. of Lanes	Average Speed		
			A.M.	P.M.	
North-South Roadway:	Portola Pkwy	At Grade	6	20	20
East-West Roadway:	SR-241 SB Ramps	At Grade	2	20	20

### A.M. Peak Hour Traffic Volumes



### P.M. Peak Hour Traffic Volumes



### Highest Traffic Volumes (Vehicles per Hour)

N-S Road:	2,860	N-S Road:	1,954
E-W Road:	80	E-W Road:	520

## Roadway CO Contributions and Concentrations

$$\text{Emissions} = (A \times B \times C) / 100,000^1$$

Roadway	A <sub>1</sub>	A <sub>2</sub>	A <sub>3</sub>	B	C	Estimated CO Concentrations		
	Reference CO Concentrations 25 Feet	50 Feet	100 Feet	Traffic Volume	Emission Factors <sup>2</sup>	25 Feet	50 Feet	100 Feet
<b>A.M. Peak Traffic Hour</b>								
North-South Road	6.1	4.9	3.5	2,860	1.09	0.19	0.15	0.11
East-West Road	2.7	2.2	1.7	80	1.09	0.00	0.00	0.00
<b>P.M. Peak Traffic Hour</b>								
North-South Road	6.1	4.9	3.5	1,954	1.09	0.13	0.10	0.07
East-West Road	2.7	2.2	1.7	520	1.09	0.02	0.01	0.01

<sup>1</sup> Methodology from Bay Area Air Quality Management District *BAAQMD CEQA Guidelines* (1996).

<sup>2</sup> Emission factors from EMFAC2002 (2003).

## Total Roadway CO Concentrations

$$\text{Peak Hour Emissions} = \text{North-South Concentration} + \text{East-West Concentration} + \text{Background 1-hour Concentration}^2$$

$$\text{8-Hour Emissions} = ((\text{Highest Peak Hour Concentration} - \text{Background 1-hour Concentration}) \times \text{Persistence Factor}) + \text{Background 8-hour Concentration}$$

	A.M. Peak Hour	P.M. Peak Hour	8-Hour
25 Feet from Roadway Edge	3.2	3.1	1.7
50 Feet from Roadway Edge	3.2	3.1	1.6
100 Feet from Roadway Edge	3.1	3.1	1.6

<sup>2</sup> Methodology from Bay Area Air Quality Management District *BAAQMD CEQA Guidelines* (1996).

# SIMPLIFIED CALINE4 CARBON MONOXIDE ANALYSIS

Project Number: 10953-00  
 Project Title: City of Lake Forest Opportunities Study Program EIR

## Background Information

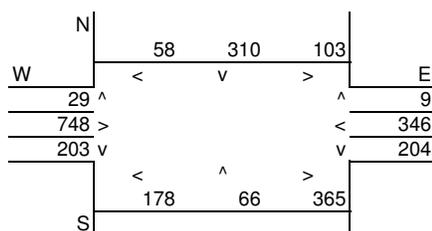
Nearest Air Monitoring Station measuring CO: Mission Viejo - 26081 Via Pera  
 Background 1-hour CO Concentration (ppm): 3.0  
 Background 8-hour CO Concentration (ppm): 1.5  
 Persistence Factor: 0.8  
 Analysis Year: 2030

## Roadway Data

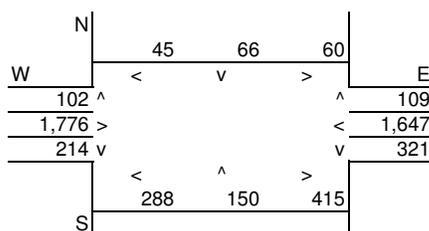
Intersection: Ridge Vly at Portola Pkwy  
 Analysis Condition: Year 2030 Traffic Volumes - Proposed Project

	Roadway Type	No. of Lanes	Average Speed		
			A.M.	P.M.	
North-South Roadway:	Ridge Vly.	At Grade	8	20	15
East-West Roadway:	Portola Pkwy.	At Grade	8	20	15

### A.M. Peak Hour Traffic Volumes



### P.M. Peak Hour Traffic Volumes



### Highest Traffic Volumes (Vehicles per Hour)

N-S Road: 1,326                      N-S Road: 1,454  
 E-W Road: 1,775                      E-W Road: 4,328

## Roadway CO Contributions and Concentrations

$$\text{Emissions} = (A \times B \times C) / 100,000^1$$

Roadway	A <sub>1</sub>	A <sub>2</sub>	A <sub>3</sub>	B	C	Estimated CO Concentrations		
	Reference CO Concentrations 25 Feet	50 Feet	100 Feet	Traffic Volume	Emission Factors <sup>2</sup>	25 Feet	50 Feet	100 Feet
<b>A.M. Peak Traffic Hour</b>								
North-South Road	2.2	1.9	1.6	1,326	1.09	0.03	0.03	0.02
East-West Road	5.7	4.6	3.4	1,775	1.09	0.11	0.09	0.07
<b>P.M. Peak Traffic Hour</b>								
North-South Road	2.2	1.9	1.6	1,454	1.23	0.04	0.03	0.03
East-West Road	5.7	4.6	3.4	4,328	1.23	0.30	0.24	0.18

<sup>1</sup> Methodology from Bay Area Air Quality Management District *BAAQMD CEQA Guidelines* (1996).

<sup>2</sup> Emission factors from EMFAC2002 (2003).

## Total Roadway CO Concentrations

$$\text{Peak Hour Emissions} = \text{North-South Concentration} + \text{East-West Concentration} + \text{Background 1-hour Concentration}^2$$

$$\text{8-Hour Emissions} = ((\text{Highest Peak Hour Concentration} - \text{Background 1-hour Concentration}) \times \text{Persistence Factor}) + \text{Background 8-hour Concentration}$$

	A.M. Peak Hour	P.M. Peak Hour	8-Hour
25 Feet from Roadway Edge	3.1	3.3	1.8
50 Feet from Roadway Edge	3.1	3.3	1.7
100 Feet from Roadway Edge	3.1	3.2	1.7

<sup>2</sup> Methodology from Bay Area Air Quality Management District *BAAQMD CEQA Guidelines* (1996).

# SIMPLIFIED CALINE4 CARBON MONOXIDE ANALYSIS

**Project Number:** 10953-00  
**Project Title:** City of Lake Forest Opportunities Study Program EIR

## Background Information

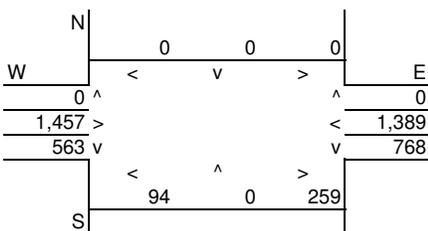
Nearest Air Monitoring Station measuring CO: Mission Viejo - 26081 Via Pera  
 Background 1-hour CO Concentration (ppm): 3.0  
 Background 8-hour CO Concentration (ppm): 1.5  
 Persistence Factor: 0.8  
 Analysis Year: 2030

## Roadway Data

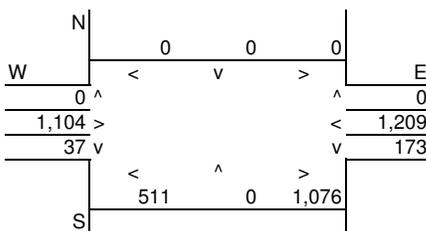
Intersection: Sand Cyn at Portola Pkwy  
 Analysis Condition: Year 2030 Traffic Volumes - Proposed Project

	Roadway Type	No. of Lanes	Average Speed		
			A.M.	P.M.	
North-South Roadway:	Sand Cyn.	At Grade	4	20	20
East-West Roadway:	Portola Pkwy.	At Grade	6	20	20

### A.M. Peak Hour Traffic Volumes



### P.M. Peak Hour Traffic Volumes



### Highest Traffic Volumes (Vehicles per Hour)

N-S Road:	1,684	N-S Road:	1,797
E-W Road:	3,873	E-W Road:	3,562

## Roadway CO Contributions and Concentrations

Emissions = (A x B x C) / 100,000<sup>1</sup>

Roadway	A <sub>1</sub>	A <sub>2</sub>	A <sub>3</sub>	B	C	Estimated CO Concentrations		
	Reference CO Concentrations 25 Feet	50 Feet	100 Feet	Traffic Volume	Emission Factors <sup>2</sup>	25 Feet	50 Feet	100 Feet
<b>A.M. Peak Traffic Hour</b>								
North-South Road	2.6	2.2	1.7	1,684	1.09	0.05	0.04	0.03
East-West Road	6.1	4.9	3.5	3,873	1.09	0.26	0.21	0.15
<b>P.M. Peak Traffic Hour</b>								
North-South Road	2.6	2.2	1.7	1,797	1.09	0.05	0.04	0.03
East-West Road	6.1	4.9	3.5	3,562	1.09	0.24	0.19	0.14

<sup>1</sup> Methodology from Bay Area Air Quality Management District *BAAQMD CEQA Guidelines* (1996).

<sup>2</sup> Emission factors from EMFAC2002 (2003).

## Total Roadway CO Concentrations

Peak Hour Emissions = North-South Concentration + East-West Concentration + Background 1-hour Concentration<sup>2</sup>

8-Hour Emissions = ((Highest Peak Hour Concentration - Background 1-hour Concentration) x Persistence Factor) + Background 8-hour Concentration

	A.M. Peak Hour	P.M. Peak Hour	8-Hour
25 Feet from Roadway Edge	3.3	3.3	1.7
50 Feet from Roadway Edge	3.2	3.2	1.7
100 Feet from Roadway Edge	3.2	3.2	1.6

<sup>2</sup> Methodology from Bay Area Air Quality Management District *BAAQMD CEQA Guidelines* (1996).

# SIMPLIFIED CALINE4 CARBON MONOXIDE ANALYSIS

**Project Number:** 10953-00  
**Project Title:** City of Lake Forest Opportunities Study Program EIR

## Background Information

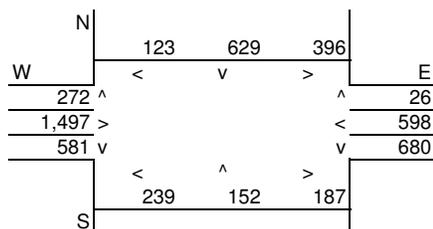
Nearest Air Monitoring Station measuring CO: Mission Viejo - 26081 Via Pera  
 Background 1-hour CO Concentration (ppm): 3.0  
 Background 8-hour CO Concentration (ppm): 1.5  
 Persistence Factor: 0.8  
 Analysis Year: 2030

## Roadway Data

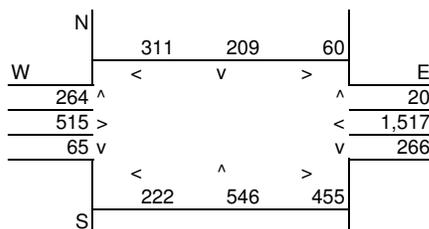
Intersection: Jeffrey Rd at Portola Pkwy  
 Analysis Condition: Year 2030 Traffic Volumes - Proposed Project

	Roadway Type	No. of Lanes	Average Speed		
			A.M.	P.M.	
North-South Roadway:	Jerrey Rd.	At Grade	8	20	20
East-West Roadway:	Portola Pkwy.	At Grade	8	20	20

### A.M. Peak Hour Traffic Volumes



### P.M. Peak Hour Traffic Volumes



### Highest Traffic Volumes (Vehicles per Hour)

N-S Road: 2,468                      N-S Road: 1,763  
 E-W Road: 3,384                      E-W Road: 2,894

## Roadway CO Contributions and Concentrations

Emissions = (A x B x C) / 100,000<sup>1</sup>

Roadway	A <sub>1</sub>	A <sub>2</sub>	A <sub>3</sub>	B	C	Estimated CO Concentrations		
	Reference CO Concentrations 25 Feet	50 Feet	100 Feet	Traffic Volume	Emission Factors <sup>2</sup>	25 Feet	50 Feet	100 Feet
<b>A.M. Peak Traffic Hour</b>								
North-South Road	2.2	1.9	1.6	2,468	1.09	0.06	0.05	0.04
East-West Road	5.7	4.6	3.4	3,384	1.09	0.21	0.17	0.13
<b>P.M. Peak Traffic Hour</b>								
North-South Road	2.2	1.9	1.6	1,763	1.09	0.04	0.04	0.03
East-West Road	5.7	4.6	3.4	2,894	1.09	0.18	0.15	0.11

<sup>1</sup> Methodology from Bay Area Air Quality Management District *BAAQMD CEQA Guidelines* (1996).

<sup>2</sup> Emission factors from EMFAC2002 (2003).

## Total Roadway CO Concentrations

Peak Hour Emissions = North-South Concentration + East-West Concentration + Background 1-hour Concentration<sup>2</sup>

8-Hour Emissions = ((Highest Peak Hour Concentration - Background 1-hour Concentration) x Persistence Factor) + Background 8-hour Concentration

	A.M. Peak Hour	P.M. Peak Hour	8-Hour
25 Feet from Roadway Edge	3.3	3.2	1.7
50 Feet from Roadway Edge	3.2	3.2	1.7
100 Feet from Roadway Edge	3.2	3.1	1.6

<sup>2</sup> Methodology from Bay Area Air Quality Management District *BAAQMD CEQA Guidelines* (1996).



# SIMPLIFIED CALINE4 CARBON MONOXIDE ANALYSIS

Project Number: 10953-00  
 Project Title: City of Lake Forest Opportunities Study Program EIR

## Background Information

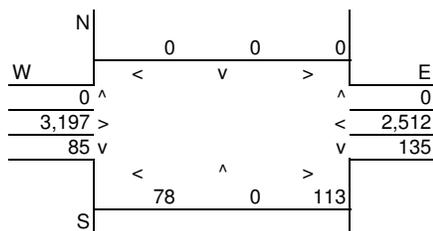
Nearest Air Monitoring Station measuring CO: Mission Viejo - 26081 Via Pera  
 Background 1-hour CO Concentration (ppm): 3.0  
 Background 8-hour CO Concentration (ppm): 1.5  
 Persistence Factor: 0.8  
 Analysis Year: 2030

## Roadway Data

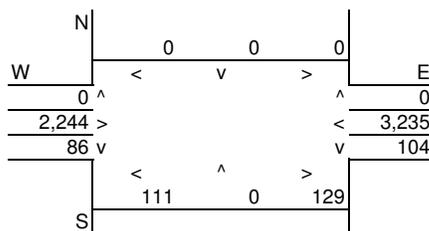
Intersection: B Dr. at Irvine Bl.  
 Analysis Condition: Year 2030 Traffic Volumes - Proposed Project

	Roadway Type	No. of Lanes	Average Speed	
			A.M.	P.M.
North-South Roadway:	B Dr.	2	15	20
East-West Roadway:	Irvine Bl.	8	15	20

### A.M. Peak Hour Traffic Volumes



### P.M. Peak Hour Traffic Volumes



### Highest Traffic Volumes (Vehicles per Hour)

N-S Road:	411	N-S Road:	430
E-W Road:	5,957	E-W Road:	5,712

## Roadway CO Contributions and Concentrations

$$\text{Emissions} = (A \times B \times C) / 100,000^1$$

Roadway	A <sub>1</sub>	A <sub>2</sub>	A <sub>3</sub>	B	C	Estimated CO Concentrations		
	Reference CO Concentrations 25 Feet	50 Feet	100 Feet	Traffic Volume	Emission Factors <sup>2</sup>	25 Feet	50 Feet	100 Feet
A.M. Peak Traffic Hour								
North-South Road	2.7	2.2	1.7	411	1.23	0.01	0.01	0.01
East-West Road	5.7	4.6	3.4	5,957	1.23	0.42	0.34	0.25
P.M. Peak Traffic Hour								
North-South Road	2.7	2.2	1.7	430	1.09	0.01	0.01	0.01
East-West Road	5.7	4.6	3.4	5,712	1.09	0.35	0.29	0.21

<sup>1</sup> Methodology from Bay Area Air Quality Management District *BAAQMD CEQA Guidelines* (1996).

<sup>2</sup> Emission factors from EMFAC2002 (2003).

## Total Roadway CO Concentrations

$$\text{Peak Hour Emissions} = \text{North-South Concentration} + \text{East-West Concentration} + \text{Background 1-hour Concentration}^2$$

$$\text{8-Hour Emissions} = ((\text{Highest Peak Hour Concentration} - \text{Background 1-hour Concentration}) \times \text{Persistence Factor}) + \text{Background 8-hour Concentration}$$

	A.M. Peak Hour	P.M. Peak Hour	8-Hour
25 Feet from Roadway Edge	3.4	3.4	1.8
50 Feet from Roadway Edge	3.3	3.3	1.8
100 Feet from Roadway Edge	3.3	3.2	1.7

<sup>2</sup> Methodology from Bay Area Air Quality Management District *BAAQMD CEQA Guidelines* (1996).

# SIMPLIFIED CALINE4 CARBON MONOXIDE ANALYSIS

**Project Number:** 10953-00  
**Project Title:** City of Lake Forest Opportunities Study Program EIR

## Background Information

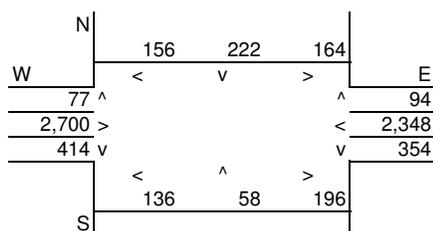
Nearest Air Monitoring Station measuring CO: Mission Viejo - 26081 Via Pera  
 Background 1-hour CO Concentration (ppm): 3.0  
 Background 8-hour CO Concentration (ppm): 1.5  
 Persistence Factor: 0.8  
 Analysis Year: 2030

## Roadway Data

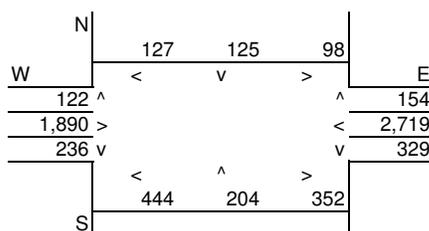
Intersection: A Dr. at Irvine Bl.  
 Analysis Condition: Year 2030 Traffic Volumes - Proposed Project

	Roadway Type	No. of Lanes	Average Speed	
			A.M.	P.M.
North-South Roadway:	A Dr.	8	15	15
East-West Roadway:	Irvine Bl.	8	15	15

### A.M. Peak Hour Traffic Volumes



### P.M. Peak Hour Traffic Volumes



### Highest Traffic Volumes (Vehicles per Hour)

N-S Road: 1,380                      N-S Road: 1,690  
 E-W Road: 5,856                      E-W Road: 5,542

## Roadway CO Contributions and Concentrations

Emissions = (A x B x C) / 100,000<sup>1</sup>

Roadway	A <sub>1</sub>	A <sub>2</sub>	A <sub>3</sub>	B	C	Estimated CO Concentrations		
	Reference CO Concentrations 25 Feet	50 Feet	100 Feet	Traffic Volume	Emission Factors <sup>2</sup>	25 Feet	50 Feet	100 Feet
<b>A.M. Peak Traffic Hour</b>								
North-South Road	2.2	1.9	1.6	1,380	1.23	0.04	0.03	0.03
East-West Road	5.7	4.6	3.4	5,856	1.23	0.41	0.33	0.24
<b>P.M. Peak Traffic Hour</b>								
North-South Road	2.2	1.9	1.6	1,690	1.23	0.05	0.04	0.03
East-West Road	5.7	4.6	3.4	5,542	1.23	0.39	0.31	0.23

<sup>1</sup> Methodology from Bay Area Air Quality Management District *BAAQMD CEQA Guidelines* (1996).

<sup>2</sup> Emission factors from EMFAC2002 (2003).

## Total Roadway CO Concentrations

Peak Hour Emissions = North-South Concentration + East-West Concentration + Background 1-hour Concentration<sup>2</sup>

8-Hour Emissions = ((Highest Peak Hour Concentration - Background 1-hour Concentration) x Persistence Factor) + Background 8-hour Concentration

	A.M. Peak Hour	P.M. Peak Hour	8-Hour
25 Feet from Roadway Edge	3.4	3.4	1.9
50 Feet from Roadway Edge	3.4	3.4	1.8
100 Feet from Roadway Edge	3.3	3.3	1.7

<sup>2</sup> Methodology from Bay Area Air Quality Management District *BAAQMD CEQA Guidelines* (1996).



# SIMPLIFIED CALINE4 CARBON MONOXIDE ANALYSIS

Project Number: 10953-00  
 Project Title: City of Lake Forest Opportunities Study Program EIR

## Background Information

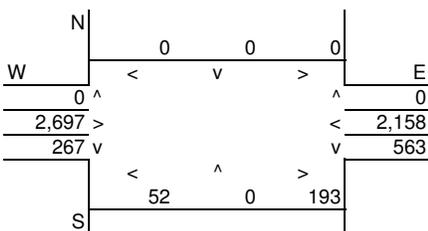
Nearest Air Monitoring Station measuring CO: Mission Viejo - 26081 Via Pera  
 Background 1-hour CO Concentration (ppm): 3.0  
 Background 8-hour CO Concentration (ppm): 1.5  
 Persistence Factor: 0.8  
 Analysis Year: 2030

## Roadway Data

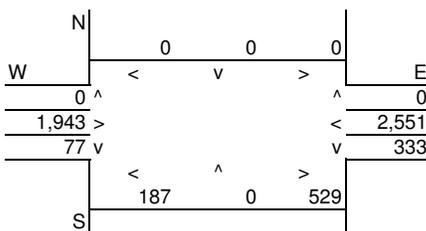
Intersection: College Dr. at Irvine Bl.  
 Analysis Condition: Year 2030 Traffic Volumes - Proposed Project

	Roadway Type	No. of Lanes	Average Speed	
			A.M.	P.M.
North-South Roadway:	College Dr.	4	20	20
East-West Roadway:	Irvine Bl.	8	20	20

### A.M. Peak Hour Traffic Volumes



### P.M. Peak Hour Traffic Volumes



### Highest Traffic Volumes (Vehicles per Hour)

N-S Road: 1,075                      N-S Road: 1,126  
 E-W Road: 5,611                      E-W Road: 5,356

## Roadway CO Contributions and Concentrations

Emissions = (A x B x C) / 100,000<sup>1</sup>

Roadway	A <sub>1</sub>	A <sub>2</sub>	A <sub>3</sub>	B	C	Estimated CO Concentrations		
	Reference CO Concentrations 25 Feet	50 Feet	100 Feet	Traffic Volume	Emission Factors <sup>2</sup>	25 Feet	50 Feet	100 Feet
A.M. Peak Traffic Hour								
North-South Road	2.6	2.2	1.7	1,075	1.09	0.03	0.03	0.02
East-West Road	5.7	4.6	3.4	5,611	1.09	0.35	0.28	0.21
P.M. Peak Traffic Hour								
North-South Road	2.6	2.2	1.7	1,126	1.09	0.03	0.03	0.02
East-West Road	5.7	4.6	3.4	5,356	1.09	0.33	0.27	0.20

<sup>1</sup> Methodology from Bay Area Air Quality Management District *BAAQMD CEQA Guidelines* (1996).

<sup>2</sup> Emission factors from EMFAC2002 (2003).

## Total Roadway CO Concentrations

Peak Hour Emissions = North-South Concentration + East-West Concentration + Background 1-hour Concentration<sup>2</sup>

8-Hour Emissions = ((Highest Peak Hour Concentration - Background 1-hour Concentration) x Persistence Factor) + Background 8-hour Concentration

	A.M. Peak Hour	P.M. Peak Hour	8-Hour
25 Feet from Roadway Edge	3.4	3.4	1.8
50 Feet from Roadway Edge	3.3	3.3	1.7
100 Feet from Roadway Edge	3.2	3.2	1.7

<sup>2</sup> Methodology from Bay Area Air Quality Management District *BAAQMD CEQA Guidelines* (1996).

# SIMPLIFIED CALINE4 CARBON MONOXIDE ANALYSIS

Project Number: 10953-00  
 Project Title: City of Lake Forest Opportunities Study Program EIR

## Background Information

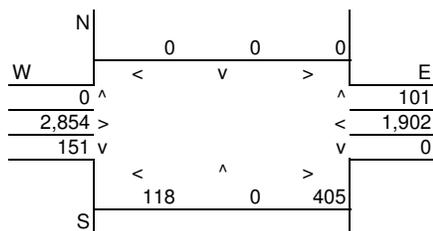
Nearest Air Monitoring Station measuring CO: Mission Viejo - 26081 Via Pera  
 Background 1-hour CO Concentration (ppm): 3.0  
 Background 8-hour CO Concentration (ppm): 1.5  
 Persistence Factor: 0.8  
 Analysis Year: 2030

## Roadway Data

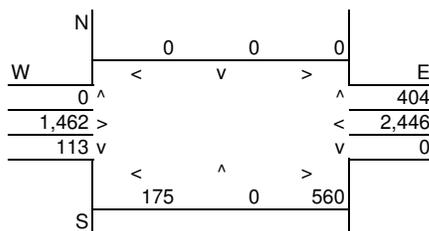
Intersection: ETC E. Leg NB Ramps at Irvine Bl.  
 Analysis Condition: Year 2030 Traffic Volumes - Proposed Project

	Roadway Type	No. of Lanes	Average Speed		
			A.M.	P.M.	
North-South Roadway:	ETC E. Leg NB Ramps	At Grade	2	15	20
East-West Roadway:	Irvine Bl.	At Grade	6	15	20

### A.M. Peak Hour Traffic Volumes



### P.M. Peak Hour Traffic Volumes



### Highest Traffic Volumes (Vehicles per Hour)

N-S Road:	674	N-S Road:	848
E-W Road:	5,262	E-W Road:	4,872

## Roadway CO Contributions and Concentrations

$$\text{Emissions} = (A \times B \times C) / 100,000^1$$

Roadway	A <sub>1</sub>	A <sub>2</sub>	A <sub>3</sub>	B	C	Estimated CO Concentrations		
	Reference CO Concentrations 25 Feet	50 Feet	100 Feet	Traffic Volume	Emission Factors <sup>2</sup>	25 Feet	50 Feet	100 Feet
A.M. Peak Traffic Hour								
North-South Road	2.7	2.2	1.7	674	1.23	0.02	0.02	0.01
East-West Road	6.1	4.9	3.5	5,262	1.23	0.39	0.32	0.23
P.M. Peak Traffic Hour								
North-South Road	2.7	2.2	1.7	848	1.09	0.02	0.02	0.02
East-West Road	6.1	4.9	3.5	4,872	1.09	0.32	0.26	0.19

<sup>1</sup> Methodology from Bay Area Air Quality Management District *BAAQMD CEQA Guidelines* (1996).

<sup>2</sup> Emission factors from EMFAC2002 (2003).

## Total Roadway CO Concentrations

$$\text{Peak Hour Emissions} = \text{North-South Concentration} + \text{East-West Concentration} + \text{Background 1-hour Concentration}^2$$

$$\text{8-Hour Emissions} = ((\text{Highest Peak Hour Concentration} - \text{Background 1-hour Concentration}) \times \text{Persistence Factor}) + \text{Background 8-hour Concentration}$$

	A.M. Peak Hour	P.M. Peak Hour	8-Hour
25 Feet from Roadway Edge	3.4	3.3	1.8
50 Feet from Roadway Edge	3.3	3.3	1.8
100 Feet from Roadway Edge	3.2	3.2	1.7

<sup>2</sup> Methodology from Bay Area Air Quality Management District *BAAQMD CEQA Guidelines* (1996).

# SIMPLIFIED CALINE4 CARBON MONOXIDE ANALYSIS

Project Number: 10953-00  
 Project Title: City of Lake Forest Opportunities Study Program EIR

## Background Information

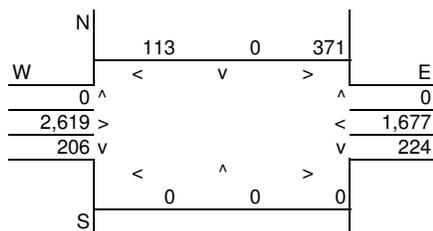
Nearest Air Monitoring Station measuring CO: Mission Viejo - 26081 Via Pera  
 Background 1-hour CO Concentration (ppm): 3.0  
 Background 8-hour CO Concentration (ppm): 1.5  
 Persistence Factor: 0.8  
 Analysis Year: 2030

## Roadway Data

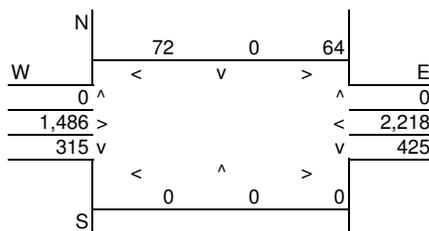
Intersection: ETC E. Leg SB Ramps at Irvine Bl.  
 Analysis Condition: Year 2030 Traffic Volumes - Proposed Project

	Roadway Type	No. of Lanes	Average Speed	
			A.M.	P.M.
North-South Roadway:	ETC E. Leg SB Ramps	4	20	20
East-West Roadway:	Irvine Bl.	8	20	20

### A.M. Peak Hour Traffic Volumes



### P.M. Peak Hour Traffic Volumes



### Highest Traffic Volumes (Vehicles per Hour)

N-S Road:	484	N-S Road:	740
E-W Road:	4,891	E-W Road:	4,193

## Roadway CO Contributions and Concentrations

$$\text{Emissions} = (A \times B \times C) / 100,000^1$$

Roadway	A <sub>1</sub>	A <sub>2</sub>	A <sub>3</sub>	B	C	Estimated CO Concentrations		
	Reference CO Concentrations 25 Feet	50 Feet	100 Feet	Traffic Volume	Emission Factors <sup>2</sup>	25 Feet	50 Feet	100 Feet
A.M. Peak Traffic Hour								
North-South Road	2.6	2.2	1.7	484	1.09	0.01	0.01	0.01
East-West Road	5.7	4.6	3.4	4,891	1.09	0.30	0.25	0.18
P.M. Peak Traffic Hour								
North-South Road	2.6	2.2	1.7	740	1.09	0.02	0.02	0.01
East-West Road	5.7	4.6	3.4	4,193	1.09	0.26	0.21	0.16

<sup>1</sup> Methodology from Bay Area Air Quality Management District *BAAQMD CEQA Guidelines* (1996).

<sup>2</sup> Emission factors from EMFAC2002 (2003).

## Total Roadway CO Concentrations

$$\text{Peak Hour Emissions} = \text{North-South Concentration} + \text{East-West Concentration} + \text{Background 1-hour Concentration}^2$$

$$\text{8-Hour Emissions} = ((\text{Highest Peak Hour Concentration} - \text{Background 1-hour Concentration}) \times \text{Persistence Factor}) + \text{Background 8-hour Concentration}$$

	A.M. Peak Hour	P.M. Peak Hour	8-Hour
25 Feet from Roadway Edge	3.3	3.3	1.8
50 Feet from Roadway Edge	3.3	3.2	1.7
100 Feet from Roadway Edge	3.2	3.2	1.7

<sup>2</sup> Methodology from Bay Area Air Quality Management District *BAAQMD CEQA Guidelines* (1996).



# SIMPLIFIED CALINE4 CARBON MONOXIDE ANALYSIS

Project Number: 10953-00  
 Project Title: City of Lake Forest Opportunities Study Program EIR

## Background Information

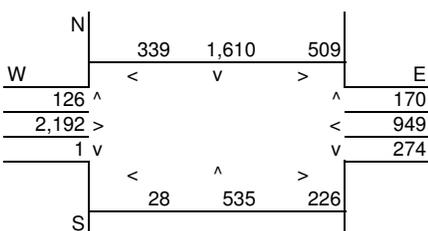
Nearest Air Monitoring Station measuring CO: Mission Viejo - 26081 Via Pera  
 Background 1-hour CO Concentration (ppm): 3.0  
 Background 8-hour CO Concentration (ppm): 1.5  
 Persistence Factor: 0.8  
 Analysis Year: 2030

## Roadway Data

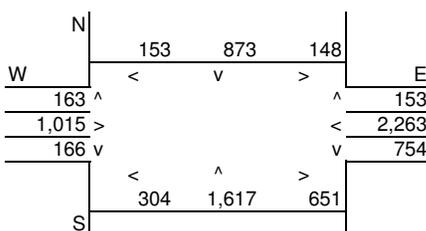
Intersection: Jeffrey Rd. at Irvine Bl.  
 Analysis Condition: Year 2030 Traffic Volumes - Proposed Project

	Roadway Type	No. of Lanes	Average Speed		
			A.M.	P.M.	
North-South Roadway:	Jeffrey Rd.	At Grade	8	15	15
East-West Roadway:	Irvine Bl.	At Grade	8	15	15

### A.M. Peak Hour Traffic Volumes



### P.M. Peak Hour Traffic Volumes



### Highest Traffic Volumes (Vehicles per Hour)

N-S Road: 3,289                      N-S Road: 4,365  
 E-W Road: 4,320                      E-W Road: 4,984

## Roadway CO Contributions and Concentrations

Emissions = (A x B x C) / 100,000<sup>1</sup>

Roadway	A <sub>1</sub>	A <sub>2</sub>	A <sub>3</sub>	B	C	Estimated CO Concentrations		
	Reference CO Concentrations 25 Feet	50 Feet	100 Feet	Traffic Volume	Emission Factors <sup>2</sup>	25 Feet	50 Feet	100 Feet
A.M. Peak Traffic Hour								
North-South Road	2.2	1.9	1.6	3,289	1.23	0.09	0.08	0.06
East-West Road	5.7	4.6	3.4	4,320	1.23	0.30	0.24	0.18
P.M. Peak Traffic Hour								
North-South Road	2.2	1.9	1.6	4,365	1.23	0.12	0.10	0.09
East-West Road	5.7	4.6	3.4	4,984	1.23	0.35	0.28	0.21

<sup>1</sup> Methodology from Bay Area Air Quality Management District *BAAQMD CEQA Guidelines* (1996).

<sup>2</sup> Emission factors from EMFAC2002 (2003).

## Total Roadway CO Concentrations

Peak Hour Emissions = North-South Concentration + East-West Concentration + Background 1-hour Concentration<sup>2</sup>

8-Hour Emissions = ((Highest Peak Hour Concentration - Background 1-hour Concentration) x Persistence Factor) + Background 8-hour Concentration

	A.M. Peak Hour	P.M. Peak Hour	8-Hour
25 Feet from Roadway Edge	3.4	3.5	1.9
50 Feet from Roadway Edge	3.3	3.4	1.8
100 Feet from Roadway Edge	3.2	3.3	1.7

<sup>2</sup> Methodology from Bay Area Air Quality Management District *BAAQMD CEQA Guidelines* (1996).

# SIMPLIFIED CALINE4 CARBON MONOXIDE ANALYSIS

**Project Number:** 10953-00  
**Project Title:** City of Lake Forest Opportunities Study Program EIR

## Background Information

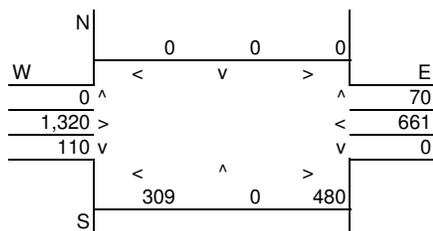
Nearest Air Monitoring Station measuring CO: Mission Viejo - 26081 Via Pera  
 Background 1-hour CO Concentration (ppm): 3.0  
 Background 8-hour CO Concentration (ppm): 1.5  
 Persistence Factor: 0.8  
 Analysis Year: 2030

## Roadway Data

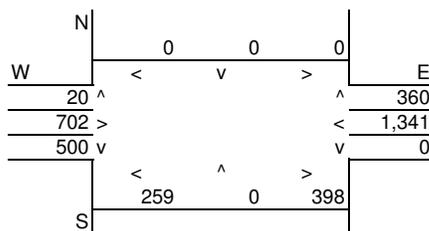
Intersection: SR-133 NB Ramps at Trabuco Rd.  
 Analysis Condition: Year 2030 Traffic Volumes - Proposed Project

	Roadway Type	No. of Lanes	Average Speed	
			A.M.	P.M.
North-South Roadway:	SR-133 NB Ramps	4	20	20
East-West Roadway:	Trabuco Rd.	4	20	20

### A.M. Peak Hour Traffic Volumes



### P.M. Peak Hour Traffic Volumes



### Highest Traffic Volumes (Vehicles per Hour)

N-S Road:	899	N-S Road:	1,157
E-W Road:	2,531	E-W Road:	2,822

## Roadway CO Contributions and Concentrations

Emissions = (A x B x C) / 100,000<sup>1</sup>

Roadway	A <sub>1</sub>	A <sub>2</sub>	A <sub>3</sub>	B	C	Estimated CO Concentrations		
	Reference CO Concentrations 25 Feet	50 Feet	100 Feet	Traffic Volume	Emission Factors <sup>2</sup>	25 Feet	50 Feet	100 Feet
<b>A.M. Peak Traffic Hour</b>								
North-South Road	2.6	2.2	1.7	899	1.09	0.03	0.02	0.02
East-West Road	7.0	5.4	3.8	2,531	1.09	0.19	0.15	0.10
<b>P.M. Peak Traffic Hour</b>								
North-South Road	2.6	2.2	1.7	1,157	1.09	0.03	0.03	0.02
East-West Road	7.0	5.4	3.8	2,822	1.09	0.22	0.17	0.12

<sup>1</sup> Methodology from Bay Area Air Quality Management District *BAAQMD CEQA Guidelines* (1996).

<sup>2</sup> Emission factors from EMFAC2002 (2003).

## Total Roadway CO Concentrations

Peak Hour Emissions = North-South Concentration + East-West Concentration + Background 1-hour Concentration<sup>2</sup>

8-Hour Emissions = ((Highest Peak Hour Concentration - Background 1-hour Concentration) x Persistence Factor) + Background 8-hour Concentration

	A.M. Peak Hour	P.M. Peak Hour	8-Hour
25 Feet from Roadway Edge	3.2	3.2	1.7
50 Feet from Roadway Edge	3.2	3.2	1.7
100 Feet from Roadway Edge	3.1	3.1	1.6

<sup>2</sup> Methodology from Bay Area Air Quality Management District *BAAQMD CEQA Guidelines* (1996).

# SIMPLIFIED CALINE4 CARBON MONOXIDE ANALYSIS

**Project Number:** 10953-00  
**Project Title:** City of Lake Forest Opportunities Study Program EIR

## Background Information

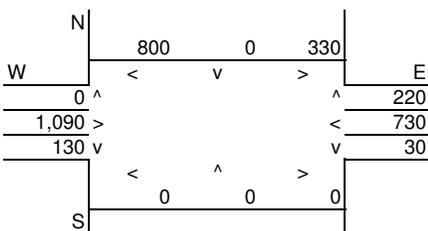
Nearest Air Monitoring Station measuring CO: Mission Viejo - 26081 Via Pera  
 Background 1-hour CO Concentration (ppm): 3.0  
 Background 8-hour CO Concentration (ppm): 1.5  
 Persistence Factor: 0.8  
 Analysis Year: 2030

## Roadway Data

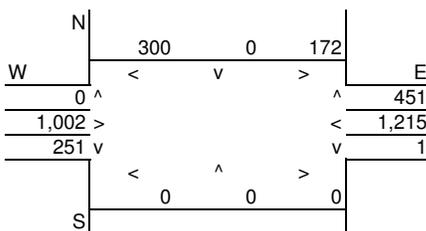
Intersection: SR-133 SB Ramps at Trabuco Rd.  
 Analysis Condition: Year 2030 Traffic Volumes - Proposed Project

	Roadway Type	No. of Lanes	Average Speed	
			A.M.	P.M.
North-South Roadway:	SR-133 SB Ramps	4	20	20
East-West Roadway:	Trabuco Rd.	4	20	20

### A.M. Peak Hour Traffic Volumes



### P.M. Peak Hour Traffic Volumes



### Highest Traffic Volumes (Vehicles per Hour)

N-S Road:	1,350	N-S Road:	923
E-W Road:	2,750	E-W Road:	2,841

## Roadway CO Contributions and Concentrations

Emissions = (A x B x C) / 100,000<sup>1</sup>

Roadway	A <sub>1</sub>	A <sub>2</sub>	A <sub>3</sub>	B	C	Estimated CO Concentrations		
	Reference CO Concentrations 25 Feet	50 Feet	100 Feet	Traffic Volume	Emission Factors <sup>2</sup>	25 Feet	50 Feet	100 Feet
<b>A.M. Peak Traffic Hour</b>								
North-South Road	2.6	2.2	1.7	1,350	1.09	0.04	0.03	0.03
East-West Road	7.0	5.4	3.8	2,750	1.09	0.21	0.16	0.11
<b>P.M. Peak Traffic Hour</b>								
North-South Road	2.6	2.2	1.7	923	1.09	0.03	0.02	0.02
East-West Road	7.0	5.4	3.8	2,841	1.09	0.22	0.17	0.12

<sup>1</sup> Methodology from Bay Area Air Quality Management District *BAAQMD CEQA Guidelines* (1996).

<sup>2</sup> Emission factors from EMFAC2002 (2003).

## Total Roadway CO Concentrations

Peak Hour Emissions = North-South Concentration + East-West Concentration + Background 1-hour Concentration<sup>2</sup>

8-Hour Emissions = ((Highest Peak Hour Concentration - Background 1-hour Concentration) x Persistence Factor) + Background 8-hour Concentration

	A.M. Peak Hour	P.M. Peak Hour	8-Hour
25 Feet from Roadway Edge	3.2	3.2	1.7
50 Feet from Roadway Edge	3.2	3.2	1.7
100 Feet from Roadway Edge	3.1	3.1	1.6

<sup>2</sup> Methodology from Bay Area Air Quality Management District *BAAQMD CEQA Guidelines* (1996).





# SIMPLIFIED CALINE4 CARBON MONOXIDE ANALYSIS

**Project Number:** 10953-00  
**Project Title:** City of Lake Forest Opportunities Study Program EIR

## Background Information

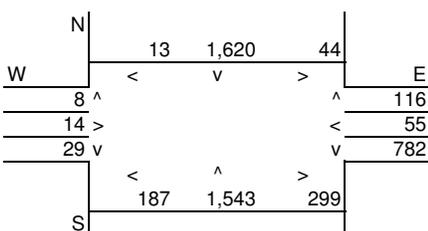
Nearest Air Monitoring Station measuring CO: Mission Viejo - 26081 Via Pera  
 Background 1-hour CO Concentration (ppm): 3.0  
 Background 8-hour CO Concentration (ppm): 1.5  
 Persistence Factor: 0.8  
 Analysis Year: 2030

## Roadway Data

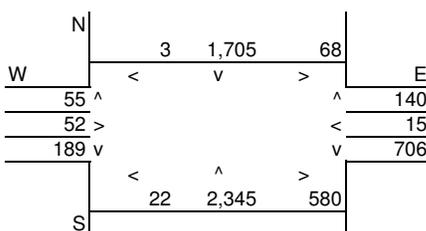
Intersection: Alton Pkwy at Jeronimo Rd  
 Analysis Condition: Year 2030 Traffic Volumes - Proposed Project

	Roadway Type	No. of Lanes	Average Speed		
			A.M.	P.M.	
North-South Roadway:	Alton Pkwy.	At Grade	8	20	20
East-West Roadway:	Jeronimo Rd.	At Grade	6	20	20

### A.M. Peak Hour Traffic Volumes



### P.M. Peak Hour Traffic Volumes



### Highest Traffic Volumes (Vehicles per Hour)

N-S Road: 4,460                      N-S Road: 5,547  
 E-W Road: 1,310                    E-W Road: 1,561

## Roadway CO Contributions and Concentrations

Emissions = (A x B x C) / 100,000<sup>1</sup>

Roadway	A <sub>1</sub>	A <sub>2</sub>	A <sub>3</sub>	B	C	Estimated CO Concentrations		
	Reference CO Concentrations 25 Feet	50 Feet	100 Feet	Traffic Volume	Emission Factors <sup>2</sup>	25 Feet	50 Feet	100 Feet
<b>A.M. Peak Traffic Hour</b>								
North-South Road	5.7	4.6	3.4	4,460	1.09	0.28	0.22	0.17
East-West Road	2.3	2.0	1.7	1,310	1.09	0.03	0.03	0.02
<b>P.M. Peak Traffic Hour</b>								
North-South Road	5.7	4.6	3.4	5,547	1.09	0.34	0.28	0.21
East-West Road	2.3	2.0	1.7	1,561	1.09	0.04	0.03	0.03

<sup>1</sup> Methodology from Bay Area Air Quality Management District *BAAQMD CEQA Guidelines* (1996).

<sup>2</sup> Emission factors from EMFAC2002 (2003).

## Total Roadway CO Concentrations

Peak Hour Emissions = North-South Concentration + East-West Concentration + Background 1-hour Concentration<sup>2</sup>

8-Hour Emissions = ((Highest Peak Hour Concentration - Background 1-hour Concentration) x Persistence Factor) + Background 8-hour Concentration

	A.M. Peak Hour	P.M. Peak Hour	8-Hour
25 Feet from Roadway Edge	3.3	3.4	1.8
50 Feet from Roadway Edge	3.3	3.3	1.7
100 Feet from Roadway Edge	3.2	3.2	1.7

<sup>2</sup> Methodology from Bay Area Air Quality Management District *BAAQMD CEQA Guidelines* (1996).



# SIMPLIFIED CALINE4 CARBON MONOXIDE ANALYSIS

Project Number: 10953-00  
 Project Title: City of Lake Forest Opportunities Study Program EIR

## Background Information

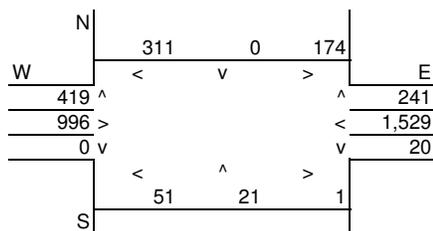
Nearest Air Monitoring Station measuring CO: Mission Viejo - 26081 Via Pera  
 Background 1-hour CO Concentration (ppm): 3.0  
 Background 8-hour CO Concentration (ppm): 1.5  
 Persistence Factor: 0.8  
 Analysis Year: 2030

## Roadway Data

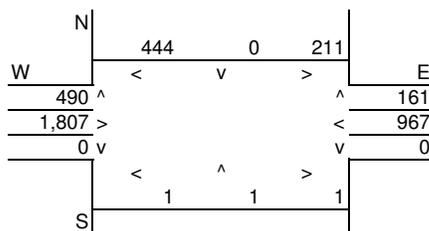
Intersection: Marine Wy at Alton Pk  
 Analysis Condition: Year 2030 Traffic Volumes - Proposed Project

	Roadway Type	No. of Lanes	Average Speed		
			A.M.	P.M.	
North-South Roadway:	Marine Wy.	At Grade	8	20	20
East-West Roadway:	Alton Pk.	At Grade	8	20	20

### A.M. Peak Hour Traffic Volumes



### P.M. Peak Hour Traffic Volumes



### Highest Traffic Volumes (Vehicles per Hour)

N-S Road:	1,166	N-S Road:	1,307
E-W Road:	3,306	E-W Road:	3,709

## Roadway CO Contributions and Concentrations

Emissions = (A x B x C) / 100,000<sup>1</sup>

Roadway	A <sub>1</sub>	A <sub>2</sub>	A <sub>3</sub>	B	C	Estimated CO Concentrations		
	Reference CO Concentrations 25 Feet	50 Feet	100 Feet	Traffic Volume	Emission Factors <sup>2</sup>	25 Feet	50 Feet	100 Feet
A.M. Peak Traffic Hour								
North-South Road	2.2	1.9	1.6	1,166	1.09	0.03	0.02	0.02
East-West Road	5.7	4.6	3.4	3,306	1.09	0.21	0.17	0.12
P.M. Peak Traffic Hour								
North-South Road	2.2	1.9	1.6	1,307	1.09	0.03	0.03	0.02
East-West Road	5.7	4.6	3.4	3,709	1.09	0.23	0.19	0.14

<sup>1</sup> Methodology from Bay Area Air Quality Management District *BAAQMD CEQA Guidelines* (1996).

<sup>2</sup> Emission factors from EMFAC2002 (2003).

## Total Roadway CO Concentrations

Peak Hour Emissions = North-South Concentration + East-West Concentration + Background 1-hour Concentration<sup>2</sup>

8-Hour Emissions = ((Highest Peak Hour Concentration - Background 1-hour Concentration) x Persistence Factor) + Background 8-hour Concentration

	A.M. Peak Hour	P.M. Peak Hour	8-Hour
25 Feet from Roadway Edge	3.2	3.3	1.7
50 Feet from Roadway Edge	3.2	3.2	1.7
100 Feet from Roadway Edge	3.1	3.2	1.6

<sup>2</sup> Methodology from Bay Area Air Quality Management District *BAAQMD CEQA Guidelines* (1996).

# SIMPLIFIED CALINE4 CARBON MONOXIDE ANALYSIS

**Project Number:** 10953-00  
**Project Title:** City of Lake Forest Opportunities Study Program EIR

## Background Information

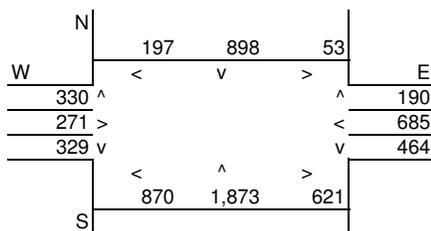
Nearest Air Monitoring Station measuring CO: Mission Viejo - 26081 Via Pera  
 Background 1-hour CO Concentration (ppm): 3.0  
 Background 8-hour CO Concentration (ppm): 1.5  
 Persistence Factor: 0.8  
 Analysis Year: 2030

## Roadway Data

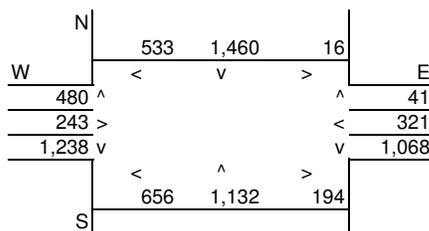
Intersection: Alton Pkwy at Technology Dr. W.  
 Analysis Condition: Year 2030 Traffic Volumes - Proposed Project

	Roadway Type	No. of Lanes	Average Speed		
			A.M.	P.M.	
North-South Roadway:	Alton Pkwy.	At Grade	8	15	15
East-West Roadway:	Technology Dr. W.	At Grade	8	15	15

### A.M. Peak Hour Traffic Volumes



### P.M. Peak Hour Traffic Volumes



### Highest Traffic Volumes (Vehicles per Hour)

N-S Road:	5,055	N-S Road:	5,748
E-W Road:	2,682	E-W Road:	3,471

## Roadway CO Contributions and Concentrations

Emissions = (A x B x C) / 100,000<sup>1</sup>

Roadway	A <sub>1</sub>	A <sub>2</sub>	A <sub>3</sub>	B	C	Estimated CO Concentrations		
	Reference CO Concentrations 25 Feet	50 Feet	100 Feet	Traffic Volume	Emission Factors <sup>2</sup>	25 Feet	50 Feet	100 Feet
<b>A.M. Peak Traffic Hour</b>								
North-South Road	5.7	4.6	3.4	5,055	1.23	0.35	0.29	0.21
East-West Road	2.2	1.9	1.6	2,682	1.23	0.07	0.06	0.05
<b>P.M. Peak Traffic Hour</b>								
North-South Road	5.7	4.6	3.4	5,748	1.23	0.40	0.33	0.24
East-West Road	2.2	1.9	1.6	3,471	1.23	0.09	0.08	0.07

<sup>1</sup> Methodology from Bay Area Air Quality Management District *BAAQMD CEQA Guidelines* (1996).

<sup>2</sup> Emission factors from EMFAC2002 (2003).

## Total Roadway CO Concentrations

Peak Hour Emissions = North-South Concentration + East-West Concentration + Background 1-hour Concentration<sup>2</sup>

8-Hour Emissions = ((Highest Peak Hour Concentration - Background 1-hour Concentration) x Persistence Factor) + Background 8-hour Concentration

	A.M. Peak Hour	P.M. Peak Hour	8-Hour
25 Feet from Roadway Edge	3.4	3.5	1.9
50 Feet from Roadway Edge	3.3	3.4	1.8
100 Feet from Roadway Edge	3.3	3.3	1.7

<sup>2</sup> Methodology from Bay Area Air Quality Management District *BAAQMD CEQA Guidelines* (1996).



# SIMPLIFIED CALINE4 CARBON MONOXIDE ANALYSIS

Project Number: 10953-00  
 Project Title: City of Lake Forest Opportunities Study Program EIR

## Background Information

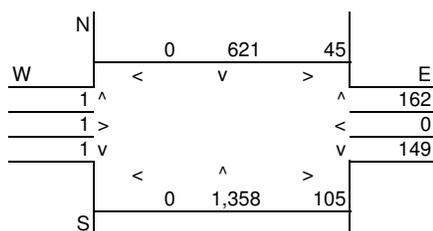
Nearest Air Monitoring Station measuring CO: Mission Viejo - 26081 Via Pera  
 Background 1-hour CO Concentration (ppm): 3.0  
 Background 8-hour CO Concentration (ppm): 1.5  
 Persistence Factor: 0.8  
 Analysis Year: 2030

## Roadway Data

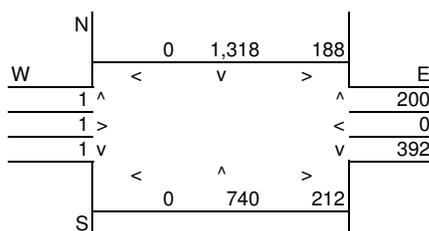
Intersection: Marine Wy at Rockfield  
 Analysis Condition: Year 2030 Traffic Volumes - Proposed Project

	Roadway Type	No. of Lanes	Average Speed		
			A.M.	P.M.	
North-South Roadway:	Marine Wy.	At Grade	6	20	20
East-West Roadway:	Rockfield	At Grade	4	20	20

### A.M. Peak Hour Traffic Volumes



### P.M. Peak Hour Traffic Volumes



### Highest Traffic Volumes (Vehicles per Hour)

N-S Road:	2,234	N-S Road:	2,663
E-W Road:	462	E-W Road:	993

## Roadway CO Contributions and Concentrations

Emissions = (A x B x C) / 100,000<sup>1</sup>

Roadway	A <sub>1</sub>	A <sub>2</sub>	A <sub>3</sub>	B	C	Estimated CO Concentrations		
	Reference CO Concentrations 25 Feet	50 Feet	100 Feet	Traffic Volume	Emission Factors <sup>2</sup>	25 Feet	50 Feet	100 Feet
A.M. Peak Traffic Hour								
North-South Road	6.1	4.9	3.5	2,234	1.09	0.15	0.12	0.09
East-West Road	2.6	2.2	1.7	462	1.09	0.01	0.01	0.01
P.M. Peak Traffic Hour								
North-South Road	6.1	4.9	3.5	2,663	1.09	0.18	0.14	0.10
East-West Road	2.6	2.2	1.7	993	1.09	0.03	0.02	0.02

<sup>1</sup> Methodology from Bay Area Air Quality Management District *BAAQMD CEQA Guidelines* (1996).

<sup>2</sup> Emission factors from EMFAC2002 (2003).

## Total Roadway CO Concentrations

Peak Hour Emissions = North-South Concentration + East-West Concentration + Background 1-hour Concentration<sup>2</sup>

8-Hour Emissions = ((Highest Peak Hour Concentration - Background 1-hour Concentration) x Persistence Factor) + Background 8-hour Concentration

	A.M. Peak Hour	P.M. Peak Hour	8-Hour
25 Feet from Roadway Edge	3.2	3.2	1.7
50 Feet from Roadway Edge	3.1	3.2	1.6
100 Feet from Roadway Edge	3.1	3.1	1.6

<sup>2</sup> Methodology from Bay Area Air Quality Management District *BAAQMD CEQA Guidelines* (1996).

# SIMPLIFIED CALINE4 CARBON MONOXIDE ANALYSIS

Project Number: 10953-00  
 Project Title: City of Lake Forest Opportunities Study Program EIR

## Background Information

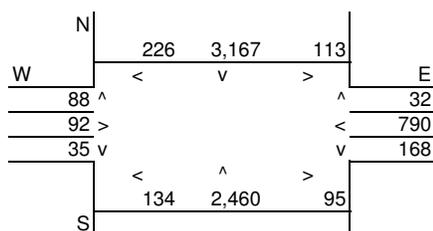
Nearest Air Monitoring Station measuring CO: Mission Viejo - 26081 Via Pera  
 Background 1-hour CO Concentration (ppm): 3.0  
 Background 8-hour CO Concentration (ppm): 1.5  
 Persistence Factor: 0.8  
 Analysis Year: 2030

## Roadway Data

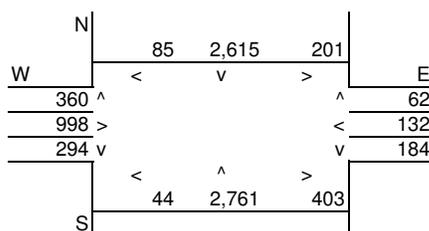
Intersection: Bake Pkwy at Muirlands  
 Analysis Condition: Year 2030 Traffic Volumes - Proposed Project

	Roadway Type	No. of Lanes	Average Speed		
			A.M.	P.M.	
North-South Roadway:	Bake Pkwy.	At Grade	8	15	15
East-West Roadway:	Muirlands	At Grade	8	15	15

### A.M. Peak Hour Traffic Volumes



### P.M. Peak Hour Traffic Volumes



### Highest Traffic Volumes (Vehicles per Hour)

N-S Road:	6,086	N-S Road:	6,301
E-W Road:	1,365	E-W Road:	1,980

## Roadway CO Contributions and Concentrations

$$\text{Emissions} = (A \times B \times C) / 100,000^1$$

Roadway	A <sub>1</sub>	A <sub>2</sub>	A <sub>3</sub>	B	C	Estimated CO Concentrations		
	Reference CO Concentrations 25 Feet	50 Feet	100 Feet	Traffic Volume	Emission Factors <sup>2</sup>	25 Feet	50 Feet	100 Feet
A.M. Peak Traffic Hour								
North-South Road	5.7	4.6	3.4	6,086	1.23	0.43	0.34	0.25
East-West Road	2.2	1.9	1.6	1,365	1.23	0.04	0.03	0.03
P.M. Peak Traffic Hour								
North-South Road	5.7	4.6	3.4	6,301	1.23	0.44	0.36	0.26
East-West Road	2.2	1.9	1.6	1,980	1.23	0.05	0.05	0.04

<sup>1</sup> Methodology from Bay Area Air Quality Management District *BAAQMD CEQA Guidelines* (1996).

<sup>2</sup> Emission factors from EMFAC2002 (2003).

## Total Roadway CO Concentrations

$$\text{Peak Hour Emissions} = \text{North-South Concentration} + \text{East-West Concentration} + \text{Background 1-hour Concentration}^2$$

$$\text{8-Hour Emissions} = ((\text{Highest Peak Hour Concentration} - \text{Background 1-hour Concentration}) \times \text{Persistence Factor}) + \text{Background 8-hour Concentration}$$

	A.M. Peak Hour	P.M. Peak Hour	8-Hour
25 Feet from Roadway Edge	3.5	3.5	1.9
50 Feet from Roadway Edge	3.4	3.4	1.8
100 Feet from Roadway Edge	3.3	3.3	1.7

<sup>2</sup> Methodology from Bay Area Air Quality Management District *BAAQMD CEQA Guidelines* (1996).

# SIMPLIFIED CALINE4 CARBON MONOXIDE ANALYSIS

Project Number: 10953-00  
 Project Title: City of Lake Forest Opportunities Study Program EIR

## Background Information

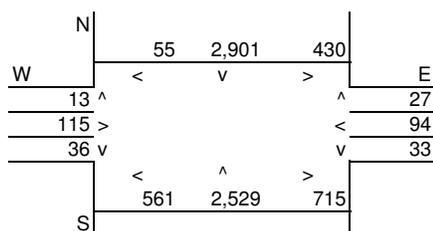
Nearest Air Monitoring Station measuring CO: Mission Viejo - 26081 Via Pera  
 Background 1-hour CO Concentration (ppm): 3.0  
 Background 8-hour CO Concentration (ppm): 1.5  
 Persistence Factor: 0.8  
 Analysis Year: 2030

## Roadway Data

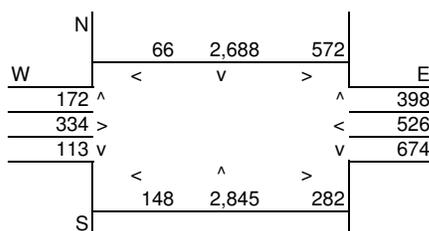
Intersection: Bake Pkwy at Rockfield Bl  
 Analysis Condition: Year 2030 Traffic Volumes - Proposed Project

	Roadway Type	No. of Lanes	Average Speed		
			A.M.	P.M.	
North-South Roadway:	Bake Pkwy.	At Grade	8	20	10
East-West Roadway:	Rockfield Bl.	At Grade	8	20	10

### A.M. Peak Hour Traffic Volumes



### P.M. Peak Hour Traffic Volumes



### Highest Traffic Volumes (Vehicles per Hour)

N-S Road: 6,775  
 E-W Road: 1,414

N-S Road: 6,750  
 E-W Road: 2,786

## Roadway CO Contributions and Concentrations

$$\text{Emissions} = (A \times B \times C) / 100,000^1$$

Roadway	A <sub>1</sub>	A <sub>2</sub>	A <sub>3</sub>	B	C	Estimated CO Concentrations		
	Reference CO Concentrations 25 Feet	50 Feet	100 Feet	Traffic Volume	Emission Factors <sup>2</sup>	25 Feet	50 Feet	100 Feet
A.M. Peak Traffic Hour								
North-South Road	5.7	4.6	3.4	6,775	1.09	0.42	0.34	0.25
East-West Road	2.2	1.9	1.6	1,414	1.09	0.03	0.03	0.02
P.M. Peak Traffic Hour								
North-South Road	5.7	4.6	3.4	6,750	1.41	0.54	0.44	0.32
East-West Road	2.2	1.9	1.6	2,786	1.41	0.09	0.07	0.06

<sup>1</sup> Methodology from Bay Area Air Quality Management District *BAAQMD CEQA Guidelines* (1996).

<sup>2</sup> Emission factors from EMFAC2002 (2003).

## Total Roadway CO Concentrations

$$\text{Peak Hour Emissions} = \text{North-South Concentration} + \text{East-West Concentration} + \text{Background 1-hour Concentration}^2$$

$$\text{8-Hour Emissions} = ((\text{Highest Peak Hour Concentration} - \text{Background 1-hour Concentration}) \times \text{Persistence Factor}) + \text{Background 8-hour Concentration}$$

	A.M. Peak Hour	P.M. Peak Hour	8-Hour
25 Feet from Roadway Edge	3.5	3.6	2.0
50 Feet from Roadway Edge	3.4	3.5	1.9
100 Feet from Roadway Edge	3.3	3.4	1.8

<sup>2</sup> Methodology from Bay Area Air Quality Management District *BAAQMD CEQA Guidelines* (1996).

# SIMPLIFIED CALINE4 CARBON MONOXIDE ANALYSIS

**Project Number:** 10953-00  
**Project Title:** City of Lake Forest Opportunities Study Program EIR

## Background Information

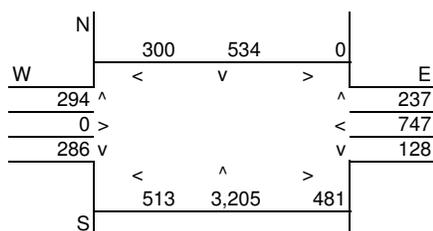
Nearest Air Monitoring Station measuring CO: Mission Viejo - 26081 Via Pera  
 Background 1-hour CO Concentration (ppm): 3.0  
 Background 8-hour CO Concentration (ppm): 1.5  
 Persistence Factor: 0.8  
 Analysis Year: 2030

## Roadway Data

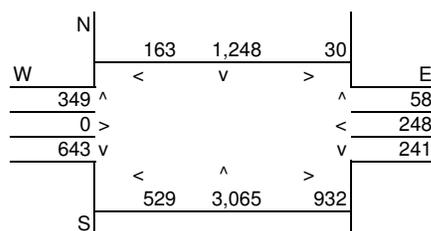
Intersection: Bake Pkwy at I-5 NB Ramps  
 Analysis Condition: Year 2030 Traffic Volumes - Proposed Project

	Roadway Type	No. of Lanes	Average Speed		
			A.M.	P.M.	
North-South Roadway:	Bake Pkwy.	At Grade	8	10	10
East-West Roadway:	I-5 NB Ramps	At Grade	8	10	10

### A.M. Peak Hour Traffic Volumes



### P.M. Peak Hour Traffic Volumes



### Highest Traffic Volumes (Vehicles per Hour)

N-S Road: 5,147                      N-S Road: 6,658  
 E-W Road: 2,140                    E-W Road: 1,932

## Roadway CO Contributions and Concentrations

Emissions = (A x B x C) / 100,000<sup>1</sup>

Roadway	A <sub>1</sub>	A <sub>2</sub>	A <sub>3</sub>	B	C	Estimated CO Concentrations		
	Reference CO Concentrations 25 Feet	50 Feet	100 Feet	Traffic Volume	Emission Factors <sup>2</sup>	25 Feet	50 Feet	100 Feet
<b>A.M. Peak Traffic Hour</b>								
North-South Road	5.7	4.6	3.4	5,147	1.41	0.41	0.33	0.25
East-West Road	2.2	1.9	1.6	2,140	1.41	0.07	0.06	0.05
<b>P.M. Peak Traffic Hour</b>								
North-South Road	5.7	4.6	3.4	6,658	1.41	0.54	0.43	0.32
East-West Road	2.2	1.9	1.6	1,932	1.41	0.06	0.05	0.04

<sup>1</sup> Methodology from Bay Area Air Quality Management District *BAAQMD CEQA Guidelines* (1996).

<sup>2</sup> Emission factors from EMFAC2002 (2003).

## Total Roadway CO Concentrations

Peak Hour Emissions = North-South Concentration + East-West Concentration + Background 1-hour Concentration<sup>2</sup>

8-Hour Emissions = ((Highest Peak Hour Concentration - Background 1-hour Concentration) x Persistence Factor) + Background 8-hour Concentration

	A.M. Peak Hour	P.M. Peak Hour	8-Hour
25 Feet from Roadway Edge	3.5	3.6	2.0
50 Feet from Roadway Edge	3.4	3.5	1.9
100 Feet from Roadway Edge	3.3	3.4	1.8

<sup>2</sup> Methodology from Bay Area Air Quality Management District *BAAQMD CEQA Guidelines* (1996).

# SIMPLIFIED CALINE4 CARBON MONOXIDE ANALYSIS

Project Number: 10953-00  
 Project Title: City of Lake Forest Opportunities Study Program EIR

## Background Information

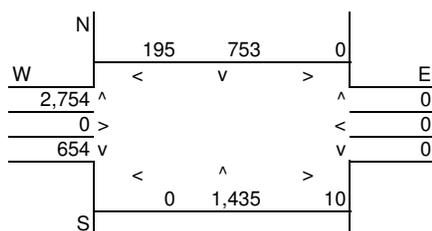
Nearest Air Monitoring Station measuring CO: Mission Viejo - 26081 Via Pera  
 Background 1-hour CO Concentration (ppm): 3.0  
 Background 8-hour CO Concentration (ppm): 1.5  
 Persistence Factor: 0.8  
 Analysis Year: 2030

## Roadway Data

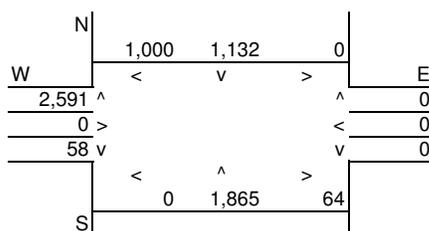
Intersection: Bake Pkwy at I-5 SB Ramps  
 Analysis Condition: Year 2030 Traffic Volumes - Proposed Project

	Roadway Type	No. of Lanes	Average Speed		
			A.M.	P.M.	
North-South Roadway:	Bake Pkwy.	At Grade	6	15	10
East-West Roadway:	I-5 SB Ramps	At Grade	4	15	10

### A.M. Peak Hour Traffic Volumes



### P.M. Peak Hour Traffic Volumes



### Highest Traffic Volumes (Vehicles per Hour)

N-S Road: 5,137	N-S Road: 6,588
E-W Road: 3,603	E-W Road: 3,649

## Roadway CO Contributions and Concentrations

Emissions = (A x B x C) / 100,000<sup>1</sup>

Roadway	A <sub>1</sub>	A <sub>2</sub>	A <sub>3</sub>	B	C	Estimated CO Concentrations		
	Reference CO Concentrations 25 Feet	50 Feet	100 Feet	Traffic Volume	Emission Factors <sup>2</sup>	25 Feet	50 Feet	100 Feet
A.M. Peak Traffic Hour								
North-South Road	6.1	4.9	3.5	5,137	1.23	0.39	0.31	0.22
East-West Road	2.6	2.2	1.7	3,603	1.23	0.12	0.10	0.08
P.M. Peak Traffic Hour								
North-South Road	6.1	4.9	3.5	6,588	1.41	0.57	0.46	0.33
East-West Road	2.6	2.2	1.7	3,649	1.41	0.13	0.11	0.09

<sup>1</sup> Methodology from Bay Area Air Quality Management District *BAAQMD CEQA Guidelines* (1996).

<sup>2</sup> Emission factors from EMFAC2002 (2003).

## Total Roadway CO Concentrations

Peak Hour Emissions = North-South Concentration + East-West Concentration + Background 1-hour Concentration<sup>2</sup>

8-Hour Emissions = ((Highest Peak Hour Concentration - Background 1-hour Concentration) x Persistence Factor) + Background 8-hour Concentration

	A.M. Peak Hour	P.M. Peak Hour	8-Hour
25 Feet from Roadway Edge	3.5	3.7	2.1
50 Feet from Roadway Edge	3.4	3.6	2.0
100 Feet from Roadway Edge	3.3	3.4	1.8

<sup>2</sup> Methodology from Bay Area Air Quality Management District *BAAQMD CEQA Guidelines* (1996).

# SIMPLIFIED CALINE4 CARBON MONOXIDE ANALYSIS

**Project Number:** 10953-00  
**Project Title:** City of Lake Forest Opportunities Study Program EIR

## Background Information

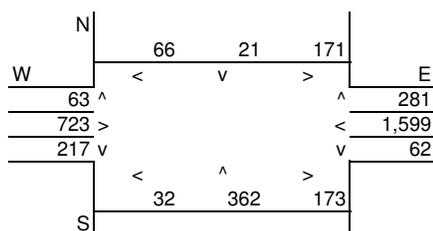
Nearest Air Monitoring Station measuring CO: Mission Viejo - 26081 Via Pera  
 Background 1-hour CO Concentration (ppm): 3.0  
 Background 8-hour CO Concentration (ppm): 1.5  
 Persistence Factor: 0.8  
 Analysis Year: 2030

## Roadway Data

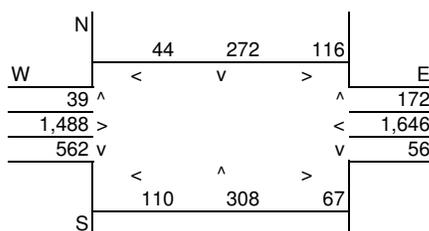
Intersection: Bake Pkwy at Irvine Center Dr.  
 Analysis Condition: Year 2030 Traffic Volumes - Proposed Project

	Roadway Type	No. of Lanes	Average Speed		
			A.M.	P.M.	
North-South Roadway:	Bake Pkwy.	At Grade	8	20	20
East-West Roadway:	Irvine Center Dr.	At Grade	8	20	20

### A.M. Peak Hour Traffic Volumes



### P.M. Peak Hour Traffic Volumes



### Highest Traffic Volumes (Vehicles per Hour)

N-S Road:	964	N-S Road:	1,375
E-W Road:	3,009	E-W Road:	3,889

## Roadway CO Contributions and Concentrations

Emissions = (A x B x C) / 100,000<sup>1</sup>

Roadway	A <sub>1</sub>	A <sub>2</sub>	A <sub>3</sub>	B	C	Estimated CO Concentrations		
	Reference CO Concentrations 25 Feet	50 Feet	100 Feet	Traffic Volume	Emission Factors <sup>2</sup>	25 Feet	50 Feet	100 Feet
<b>A.M. Peak Traffic Hour</b>								
North-South Road	2.2	1.9	1.6	964	1.09	0.02	0.02	0.02
East-West Road	5.7	4.6	3.4	3,009	1.09	0.19	0.15	0.11
<b>P.M. Peak Traffic Hour</b>								
North-South Road	2.2	1.9	1.6	1,375	1.09	0.03	0.03	0.02
East-West Road	5.7	4.6	3.4	3,889	1.09	0.24	0.19	0.14

<sup>1</sup> Methodology from Bay Area Air Quality Management District *BAAQMD CEQA Guidelines* (1996).

<sup>2</sup> Emission factors from EMFAC2002 (2003).

## Total Roadway CO Concentrations

Peak Hour Emissions = North-South Concentration + East-West Concentration + Background 1-hour Concentration<sup>2</sup>

8-Hour Emissions = ((Highest Peak Hour Concentration - Background 1-hour Concentration) x Persistence Factor) + Background 8-hour Concentration

	A.M. Peak Hour	P.M. Peak Hour	8-Hour
25 Feet from Roadway Edge	3.2	3.3	1.7
50 Feet from Roadway Edge	3.2	3.2	1.7
100 Feet from Roadway Edge	3.1	3.2	1.6

<sup>2</sup> Methodology from Bay Area Air Quality Management District *BAAQMD CEQA Guidelines* (1996).

# SIMPLIFIED CALINE4 CARBON MONOXIDE ANALYSIS

**Project Number:** 10953-00  
**Project Title:** City of Lake Forest Opportunities Study Program EIR

## Background Information

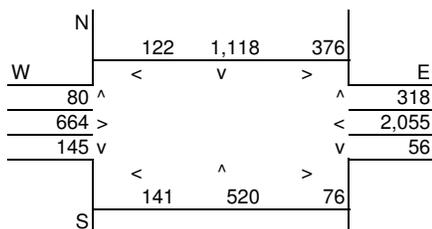
Nearest Air Monitoring Station measuring CO: Mission Viejo - 26081 Via Pera  
 Background 1-hour CO Concentration (ppm): 3.0  
 Background 8-hour CO Concentration (ppm): 1.5  
 Persistence Factor: 0.8  
 Analysis Year: 2030

## Roadway Data

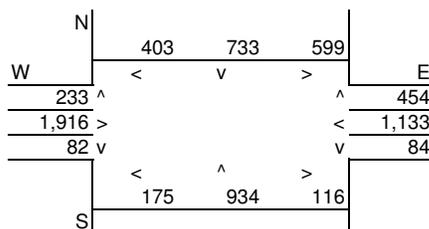
Intersection: Lake Forest Dr. at Irvine Center Dr.  
 Analysis Condition: Year 2030 Traffic Volumes - Proposed Project

	Roadway Type	No. of Lanes	Average Speed		
			A.M.	P.M.	
North-South Roadway:	Lake Forest Dr.	At Grade	8	20	15
East-West Roadway:	Irvine Center Dr.	At Grade	8	20	15

### A.M. Peak Hour Traffic Volumes



### P.M. Peak Hour Traffic Volumes



### Highest Traffic Volumes (Vehicles per Hour)

N-S Road: 2,534                      N-S Road: 3,356  
 E-W Road: 3,545                      E-W Road: 4,302

## Roadway CO Contributions and Concentrations

Emissions = (A x B x C) / 100,000<sup>1</sup>

Roadway	A <sub>1</sub>	A <sub>2</sub>	A <sub>3</sub>	B	C	Estimated CO Concentrations		
	Reference CO Concentrations 25 Feet	50 Feet	100 Feet	Traffic Volume	Emission Factors <sup>2</sup>	25 Feet	50 Feet	100 Feet
<b>A.M. Peak Traffic Hour</b>								
North-South Road	2.2	1.9	1.6	2,534	1.09	0.06	0.05	0.04
East-West Road	5.7	4.6	3.4	3,545	1.09	0.22	0.18	0.13
<b>P.M. Peak Traffic Hour</b>								
North-South Road	2.2	1.9	1.6	3,356	1.23	0.09	0.08	0.07
East-West Road	5.7	4.6	3.4	4,302	1.23	0.30	0.24	0.18

<sup>1</sup> Methodology from Bay Area Air Quality Management District *BAAQMD CEQA Guidelines* (1996).

<sup>2</sup> Emission factors from EMFAC2002 (2003).

## Total Roadway CO Concentrations

Peak Hour Emissions = North-South Concentration + East-West Concentration + Background 1-hour Concentration<sup>2</sup>

8-Hour Emissions = ((Highest Peak Hour Concentration - Background 1-hour Concentration) x Persistence Factor) + Background 8-hour Concentration

	A.M. Peak Hour	P.M. Peak Hour	8-Hour
25 Feet from Roadway Edge	3.3	3.4	1.8
50 Feet from Roadway Edge	3.2	3.3	1.8
100 Feet from Roadway Edge	3.2	3.2	1.7

<sup>2</sup> Methodology from Bay Area Air Quality Management District *BAAQMD CEQA Guidelines* (1996).



# SIMPLIFIED CALINE4 CARBON MONOXIDE ANALYSIS

Project Number: 10953-00  
 Project Title: City of Lake Forest Opportunities Study Program EIR

## Background Information

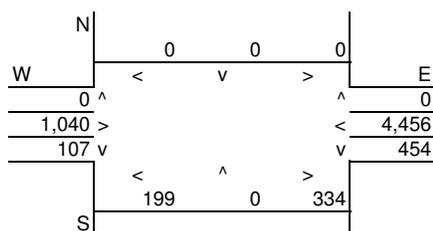
Nearest Air Monitoring Station measuring CO: Mission Viejo - 26081 Via Pera  
 Background 1-hour CO Concentration (ppm): 3.0  
 Background 8-hour CO Concentration (ppm): 1.5  
 Persistence Factor: 0.8  
 Analysis Year: 2030

## Roadway Data

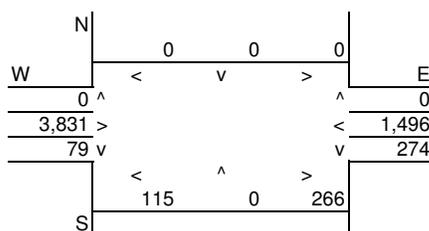
Intersection: Santa Maria Ave. at Moulton Pkwy.  
 Analysis Condition: Year 2030 Traffic Volumes - Proposed Project

	Roadway Type	No. of Lanes	Average Speed		
			A.M.	P.M.	
North-South Roadway:	Santa Maria Ave.	At Grade	4	10	10
East-West Roadway:	Moulton Pkwy.	At Grade	8	10	10

### A.M. Peak Hour Traffic Volumes



### P.M. Peak Hour Traffic Volumes



### Highest Traffic Volumes (Vehicles per Hour)

N-S Road: 1,094                      N-S Road: 734  
 E-W Road: 6,284                    E-W Road: 5,867

## Roadway CO Contributions and Concentrations

Emissions = (A x B x C) / 100,000<sup>1</sup>

Roadway	A <sub>1</sub>	A <sub>2</sub>	A <sub>3</sub>	B	C	Estimated CO Concentrations		
	Reference CO Concentrations 25 Feet	50 Feet	100 Feet	Traffic Volume	Emission Factors <sup>2</sup>	25 Feet	50 Feet	100 Feet
<b>A.M. Peak Traffic Hour</b>								
North-South Road	2.6	2.2	1.7	1,094	1.41	0.04	0.03	0.03
East-West Road	5.7	4.6	3.4	6,284	1.41	0.51	0.41	0.30
<b>P.M. Peak Traffic Hour</b>								
North-South Road	2.6	2.2	1.7	734	1.41	0.03	0.02	0.02
East-West Road	5.7	4.6	3.4	5,867	1.41	0.47	0.38	0.28

<sup>1</sup> Methodology from Bay Area Air Quality Management District *BAAQMD CEQA Guidelines* (1996).

<sup>2</sup> Emission factors from EMFAC2002 (2003).

## Total Roadway CO Concentrations

Peak Hour Emissions = North-South Concentration + East-West Concentration + Background 1-hour Concentration<sup>2</sup>

8-Hour Emissions = ((Highest Peak Hour Concentration - Background 1-hour Concentration) x Persistence Factor) + Background 8-hour Concentration

	A.M. Peak Hour	P.M. Peak Hour	8-Hour
25 Feet from Roadway Edge	3.5	3.5	1.9
50 Feet from Roadway Edge	3.4	3.4	1.9
100 Feet from Roadway Edge	3.3	3.3	1.8

<sup>2</sup> Methodology from Bay Area Air Quality Management District *BAAQMD CEQA Guidelines* (1996).

# SIMPLIFIED CALINE4 CARBON MONOXIDE ANALYSIS

**Project Number:** 10953-00  
**Project Title:** City of Lake Forest Opportunities Study Program EIR

## Background Information

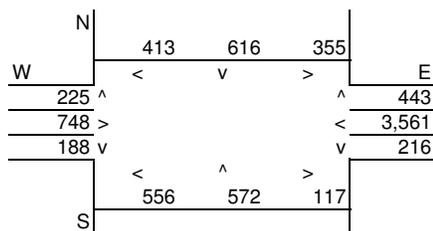
Nearest Air Monitoring Station measuring CO: Mission Viejo - 26081 Via Pera  
 Background 1-hour CO Concentration (ppm): 3.0  
 Background 8-hour CO Concentration (ppm): 1.5  
 Persistence Factor: 0.8  
 Analysis Year: 2030

## Roadway Data

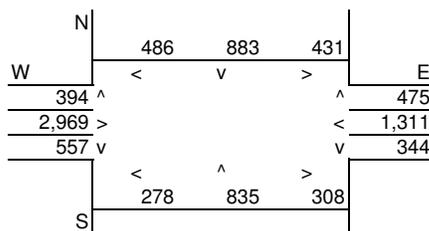
Intersection: El Toro Rd. at Moulton Pkwy.  
 Analysis Condition: Year 2030 Traffic Volumes - Proposed Project

	Roadway Type	No. of Lanes	Average Speed		
			A.M.	P.M.	
North-South Roadway:	El Toro Rd.	At Grade	8	5	5
East-West Roadway:	Moulton Pkwy.	At Grade	8	5	5

### A.M. Peak Hour Traffic Volumes



### P.M. Peak Hour Traffic Volumes



### Highest Traffic Volumes (Vehicles per Hour)

N-S Road:	2,624	N-S Road:	3,504
E-W Road:	5,691	E-W Road:	5,995

## Roadway CO Contributions and Concentrations

$$\text{Emissions} = (A \times B \times C) / 100,000^1$$

Roadway	A <sub>1</sub>	A <sub>2</sub>	A <sub>3</sub>	B	C	Estimated CO Concentrations			
	Reference CO Concentrations	25 Feet	50 Feet	100 Feet	Traffic Volume	Emission Factors <sup>2</sup>	25 Feet	50 Feet	100 Feet
<b>A.M. Peak Traffic Hour</b>									
North-South Road	2.2	1.9	1.6	2,624	1.65	0.10	0.08	0.07	
East-West Road	5.7	4.6	3.4	5,691	1.65	0.54	0.43	0.32	
<b>P.M. Peak Traffic Hour</b>									
North-South Road	2.2	1.9	1.6	3,504	1.65	0.13	0.11	0.09	
East-West Road	5.7	4.6	3.4	5,995	1.65	0.56	0.46	0.34	

<sup>1</sup> Methodology from Bay Area Air Quality Management District *BAAQMD CEQA Guidelines* (1996).

<sup>2</sup> Emission factors from EMFAC2002 (2003).

## Total Roadway CO Concentrations

$$\text{Peak Hour Emissions} = \text{North-South Concentration} + \text{East-West Concentration} + \text{Background 1-hour Concentration}^2$$

$$\text{8-Hour Emissions} = ((\text{Highest Peak Hour Concentration} - \text{Background 1-hour Concentration}) \times \text{Persistence Factor}) + \text{Background 8-hour Concentration}$$

	A.M. Peak Hour	P.M. Peak Hour	8-Hour
25 Feet from Roadway Edge	3.6	3.7	2.1
50 Feet from Roadway Edge	3.5	3.6	2.0
100 Feet from Roadway Edge	3.4	3.4	1.8

<sup>2</sup> Methodology from Bay Area Air Quality Management District *BAAQMD CEQA Guidelines* (1996).









# SIMPLIFIED CALINE4 CARBON MONOXIDE ANALYSIS

Project Number: 10953-00  
 Project Title: City of Lake Forest Opportunities Study Program EIR

## Background Information

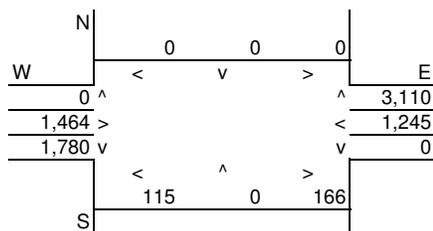
Nearest Air Monitoring Station measuring CO: Mission Viejo - 26081 Via Pera  
 Background 1-hour CO Concentration (ppm): 3.0  
 Background 8-hour CO Concentration (ppm): 1.5  
 Persistence Factor: 0.8  
 Analysis Year: 2030

## Roadway Data

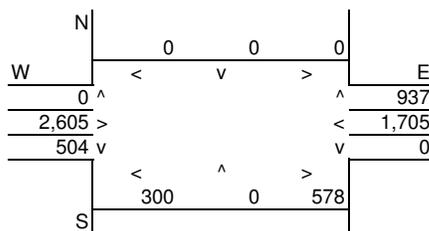
Intersection: I-5 NB Ramps at Alicia Pkwy.  
 Analysis Condition: Year 2030 Traffic Volumes - Proposed Project

	Roadway Type	No. of Lanes	Average Speed	
			A.M.	P.M.
North-South Roadway:	I-5 NB Ramps	4	20	20
East-West Roadway:	Alicia Pkwy.	6	20	20

### A.M. Peak Hour Traffic Volumes



### P.M. Peak Hour Traffic Volumes



### Highest Traffic Volumes (Vehicles per Hour)

N-S Road: 3,110                      N-S Road: 1,382  
 E-W Road: 5,985                      E-W Road: 5,825

## Roadway CO Contributions and Concentrations

Emissions = (A x B x C) / 100,000<sup>1</sup>

Roadway	A <sub>1</sub>	A <sub>2</sub>	A <sub>3</sub>	B	C	Estimated CO Concentrations		
	Reference CO Concentrations 25 Feet	50 Feet	100 Feet	Traffic Volume	Emission Factors <sup>2</sup>	25 Feet	50 Feet	100 Feet
A.M. Peak Traffic Hour								
North-South Road	2.6	2.2	1.7	3,110	1.09	0.09	0.07	0.06
East-West Road	6.1	4.9	3.5	5,985	1.09	0.40	0.32	0.23
P.M. Peak Traffic Hour								
North-South Road	2.6	2.2	1.7	1,382	1.09	0.04	0.03	0.03
East-West Road	6.1	4.9	3.5	5,825	1.09	0.39	0.31	0.22

<sup>1</sup> Methodology from Bay Area Air Quality Management District *BAAQMD CEQA Guidelines* (1996).

<sup>2</sup> Emission factors from EMFAC2002 (2003).

## Total Roadway CO Concentrations

Peak Hour Emissions = North-South Concentration + East-West Concentration + Background 1-hour Concentration<sup>2</sup>

8-Hour Emissions = ((Highest Peak Hour Concentration - Background 1-hour Concentration) x Persistence Factor) + Background 8-hour Concentration

	A.M. Peak Hour	P.M. Peak Hour	8-Hour
25 Feet from Roadway Edge	3.5	3.4	1.9
50 Feet from Roadway Edge	3.4	3.3	1.8
100 Feet from Roadway Edge	3.3	3.2	1.7

<sup>2</sup> Methodology from Bay Area Air Quality Management District *BAAQMD CEQA Guidelines* (1996).

# SIMPLIFIED CALINE4 CARBON MONOXIDE ANALYSIS

Project Number: 10953-00  
 Project Title: City of Lake Forest Opportunities Study Program EIR

## Background Information

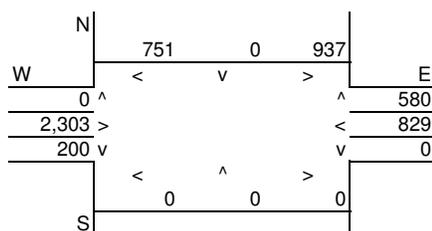
Nearest Air Monitoring Station measuring CO: Mission Viejo - 26081 Via Pera  
 Background 1-hour CO Concentration (ppm): 3.0  
 Background 8-hour CO Concentration (ppm): 1.5  
 Persistence Factor: 0.8  
 Analysis Year: 2030

## Roadway Data

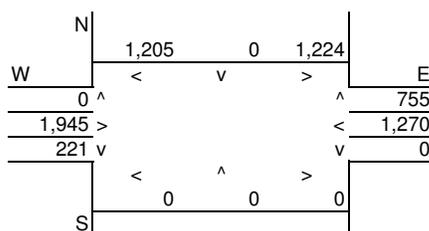
Intersection: I-5 SB Ramps at Alicia Pkwy.  
 Analysis Condition: Year 2030 Traffic Volumes - Proposed Project

	Roadway Type	No. of Lanes	Average Speed	
			A.M.	P.M.
North-South Roadway:	I-5 SB Ramps	4	20	20
East-West Roadway:	Alicia Pkwy.	6	20	20

### A.M. Peak Hour Traffic Volumes



### P.M. Peak Hour Traffic Volumes



### Highest Traffic Volumes (Vehicles per Hour)

N-S Road: 2,268  
 E-W Road: 4,649  
 N-S Road: 3,184  
 E-W Road: 5,194

## Roadway CO Contributions and Concentrations

$$\text{Emissions} = (A \times B \times C) / 100,000^1$$

Roadway	A <sub>1</sub>	A <sub>2</sub>	A <sub>3</sub>	B	C	Estimated CO Concentrations		
	Reference CO Concentrations 25 Feet	50 Feet	100 Feet	Traffic Volume	Emission Factors <sup>2</sup>	25 Feet	50 Feet	100 Feet
A.M. Peak Traffic Hour								
North-South Road	2.6	2.2	1.7	2,268	1.09	0.06	0.05	0.04
East-West Road	6.1	4.9	3.5	4,649	1.09	0.31	0.25	0.18
P.M. Peak Traffic Hour								
North-South Road	2.6	2.2	1.7	3,184	1.09	0.09	0.08	0.06
East-West Road	6.1	4.9	3.5	5,194	1.09	0.35	0.28	0.20

<sup>1</sup> Methodology from Bay Area Air Quality Management District *BAAQMD CEQA Guidelines* (1996).

<sup>2</sup> Emission factors from EMFAC2002 (2003).

## Total Roadway CO Concentrations

$$\text{Peak Hour Emissions} = \text{North-South Concentration} + \text{East-West Concentration} + \text{Background 1-hour Concentration}^2$$

$$\text{8-Hour Emissions} = ((\text{Highest Peak Hour Concentration} - \text{Background 1-hour Concentration}) \times \text{Persistence Factor}) + \text{Background 8-hour Concentration}$$

	A.M. Peak Hour	P.M. Peak Hour	8-Hour
25 Feet from Roadway Edge	3.4	3.4	1.8
50 Feet from Roadway Edge	3.3	3.4	1.8
100 Feet from Roadway Edge	3.2	3.3	1.7

<sup>2</sup> Methodology from Bay Area Air Quality Management District *BAAQMD CEQA Guidelines* (1996).

# SIMPLIFIED CALINE4 CARBON MONOXIDE ANALYSIS

**Project Number:** 10953-00  
**Project Title:** City of Lake Forest Opportunities Study Program EIR

## Background Information

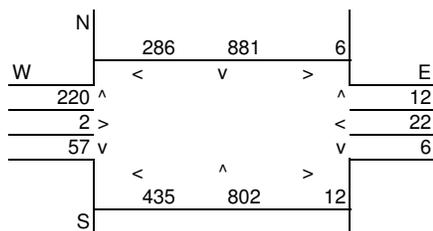
Nearest Air Monitoring Station measuring CO: Mission Viejo - 26081 Via Pera  
 Background 1-hour CO Concentration (ppm): 3.0  
 Background 8-hour CO Concentration (ppm): 1.5  
 Persistence Factor: 0.8  
 Analysis Year: 2030

## Roadway Data

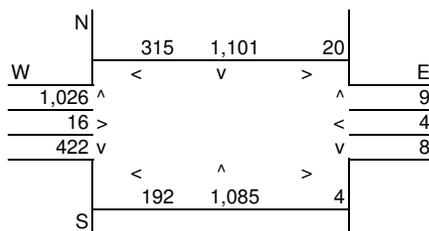
Intersection: Los Alisos Bl at Avd de la Carlota  
 Analysis Condition: Year 2030 Traffic Volumes - Proposed Project

	Roadway Type	No. of Lanes	Average Speed		
			A.M.	P.M.	
North-South Roadway:	Los Alisos Bl.	At Grade	8	20	20
East-West Roadway:	Avd de la Carlota	At Grade	6	20	20

### A.M. Peak Hour Traffic Volumes



### P.M. Peak Hour Traffic Volumes



### Highest Traffic Volumes (Vehicles per Hour)

N-S Road: 2,207  
 E-W Road: 1,022

N-S Road: 3,556  
 E-W Road: 1,975

## Roadway CO Contributions and Concentrations

$$\text{Emissions} = (A \times B \times C) / 100,000^1$$

Roadway	A <sub>1</sub>	A <sub>2</sub>	A <sub>3</sub>	B	C	Estimated CO Concentrations		
	Reference CO Concentrations 25 Feet	50 Feet	100 Feet	Traffic Volume	Emission Factors <sup>2</sup>	25 Feet	50 Feet	100 Feet
<b>A.M. Peak Traffic Hour</b>								
North-South Road	5.7	4.6	3.4	2,207	1.09	0.14	0.11	0.08
East-West Road	2.3	2.0	1.7	1,022	1.09	0.03	0.02	0.02
<b>P.M. Peak Traffic Hour</b>								
North-South Road	5.7	4.6	3.4	3,556	1.09	0.22	0.18	0.13
East-West Road	2.3	2.0	1.7	1,975	1.09	0.05	0.04	0.04

<sup>1</sup> Methodology from Bay Area Air Quality Management District *BAAQMD CEQA Guidelines* (1996).

<sup>2</sup> Emission factors from EMFAC2002 (2003).

## Total Roadway CO Concentrations

$$\text{Peak Hour Emissions} = \text{North-South Concentration} + \text{East-West Concentration} + \text{Background 1-hour Concentration}^2$$

$$\text{8-Hour Emissions} = ((\text{Highest Peak Hour Concentration} - \text{Background 1-hour Concentration}) \times \text{Persistence Factor}) + \text{Background 8-hour Concentration}$$

	A.M. Peak Hour	P.M. Peak Hour	8-Hour
25 Feet from Roadway Edge	3.2	3.3	1.7
50 Feet from Roadway Edge	3.1	3.2	1.7
100 Feet from Roadway Edge	3.1	3.2	1.6

<sup>2</sup> Methodology from Bay Area Air Quality Management District *BAAQMD CEQA Guidelines* (1996).



# SIMPLIFIED CALINE4 CARBON MONOXIDE ANALYSIS

Project Number: 10953-00  
 Project Title: City of Lake Forest Opportunities Study Program EIR

## Background Information

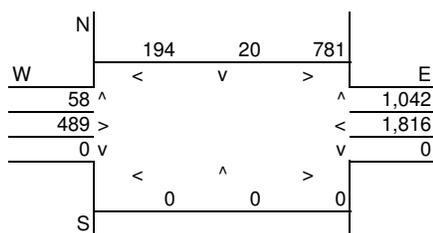
Nearest Air Monitoring Station measuring CO: Mission Viejo - 26081 Via Pera  
 Background 1-hour CO Concentration (ppm): 3.0  
 Background 8-hour CO Concentration (ppm): 1.5  
 Persistence Factor: 0.8  
 Analysis Year: 2030

## Roadway Data

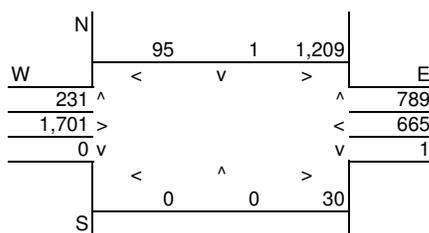
Intersection: Los Alisos Bl at Paseo de Valencia  
 Analysis Condition: Year 2030 Traffic Volumes - Proposed Project

	Roadway Type	No. of Lanes	Average Speed		
			A.M.	P.M.	
North-South Roadway:	Los Alisos Bl.	At Grade	4	20	20
East-West Roadway:	Paseo de Valencia	At Grade	8	20	20

### A.M. Peak Hour Traffic Volumes



### P.M. Peak Hour Traffic Volumes



### Highest Traffic Volumes (Vehicles per Hour)

N-S Road:	2,095	N-S Road:	2,325
E-W Road:	4,128	E-W Road:	4,395

## Roadway CO Contributions and Concentrations

$$\text{Emissions} = (A \times B \times C) / 100,000^1$$

Roadway	A <sub>1</sub>	A <sub>2</sub>	A <sub>3</sub>	B	C	Estimated CO Concentrations		
	Reference CO Concentrations 25 Feet	50 Feet	100 Feet	Traffic Volume	Emission Factors <sup>2</sup>	25 Feet	50 Feet	100 Feet
A.M. Peak Traffic Hour								
North-South Road	2.6	2.2	1.7	2,095	1.09	0.06	0.05	0.04
East-West Road	5.7	4.6	3.4	4,128	1.09	0.26	0.21	0.15
P.M. Peak Traffic Hour								
North-South Road	2.6	2.2	1.7	2,325	1.09	0.07	0.06	0.04
East-West Road	5.7	4.6	3.4	4,395	1.09	0.27	0.22	0.16

<sup>1</sup> Methodology from Bay Area Air Quality Management District *BAAQMD CEQA Guidelines* (1996).

<sup>2</sup> Emission factors from EMFAC2002 (2003).

## Total Roadway CO Concentrations

$$\text{Peak Hour Emissions} = \text{North-South Concentration} + \text{East-West Concentration} + \text{Background 1-hour Concentration}^2$$

$$\text{8-Hour Emissions} = ((\text{Highest Peak Hour Concentration} - \text{Background 1-hour Concentration}) \times \text{Persistence Factor}) + \text{Background 8-hour Concentration}$$

	A.M. Peak Hour	P.M. Peak Hour	8-Hour
25 Feet from Roadway Edge	3.3	3.3	1.8
50 Feet from Roadway Edge	3.3	3.3	1.7
100 Feet from Roadway Edge	3.2	3.2	1.7

<sup>2</sup> Methodology from Bay Area Air Quality Management District *BAAQMD CEQA Guidelines* (1996).

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**CO Analysis in Extended Study Area—Landowner Concept Plan Build-out**

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# SIMPLIFIED CALINE4 CARBON MONOXIDE ANALYSIS

**Project Number:** 10953-00  
**Project Title:** City of Lake Forest Opportunities Study Program EIR

## Background Information

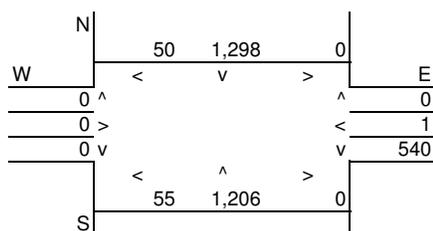
Nearest Air Monitoring Station measuring CO: Mission Viejo - 26081 Via Pera  
 Background 1-hour CO Concentration (ppm): 3.0  
 Background 8-hour CO Concentration (ppm): 1.5  
 Persistence Factor: 0.8  
 Analysis Year: 2030

## Roadway Data

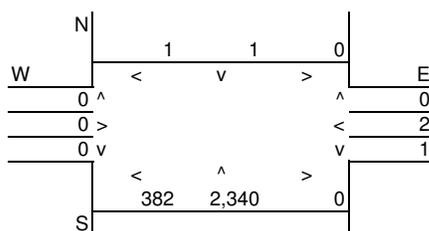
Intersection: Portola Pkwy at SR-241 NB Ramps  
 Analysis Condition: Year 2030 Traffic Volumes - Landowner Concept Plan

	Roadway Type	No. of Lanes	Average Speed		
			A.M.	P.M.	
North-South Roadway:	Portola Pkwy	At Grade	6	20	20
East-West Roadway:	SR-241 NB Ramps	At Grade	2	20	20

### A.M. Peak Hour Traffic Volumes



### P.M. Peak Hour Traffic Volumes



### Highest Traffic Volumes (Vehicles per Hour)

N-S Road:	3,099	N-S Road:	2,724
E-W Road:	541	E-W Road:	385

## Roadway CO Contributions and Concentrations

Emissions = (A x B x C) / 100,000<sup>1</sup>

Roadway	A <sub>1</sub>	A <sub>2</sub>	A <sub>3</sub>	B	C	Estimated CO Concentrations		
	Reference CO Concentrations 25 Feet	50 Feet	100 Feet	Traffic Volume	Emission Factors <sup>2</sup>	25 Feet	50 Feet	100 Feet
<b>A.M. Peak Traffic Hour</b>								
North-South Road	6.1	4.9	3.5	3,099	1.09	0.21	0.17	0.12
East-West Road	2.7	2.2	1.7	541	1.09	0.02	0.01	0.01
<b>P.M. Peak Traffic Hour</b>								
North-South Road	6.1	4.9	3.5	2,724	1.09	0.18	0.15	0.10
East-West Road	2.7	2.2	1.7	385	1.09	0.01	0.01	0.01

<sup>1</sup> Methodology from Bay Area Air Quality Management District *BAAQMD CEQA Guidelines* (1996).

<sup>2</sup> Emission factors from EMFAC2002 (2003).

## Total Roadway CO Concentrations

Peak Hour Emissions = North-South Concentration + East-West Concentration + Background 1-hour Concentration<sup>2</sup>

8-Hour Emissions = ((Highest Peak Hour Concentration - Background 1-hour Concentration) x Persistence Factor) + Background 8-hour Concentration

	A.M. Peak Hour	P.M. Peak Hour	8-Hour
25 Feet from Roadway Edge	3.2	3.2	1.7
50 Feet from Roadway Edge	3.2	3.2	1.6
100 Feet from Roadway Edge	3.1	3.1	1.6

<sup>2</sup> Methodology from Bay Area Air Quality Management District *BAAQMD CEQA Guidelines* (1996).

# SIMPLIFIED CALINE4 CARBON MONOXIDE ANALYSIS

**Project Number:** 10953-00  
**Project Title:** City of Lake Forest Opportunities Study Program EIR

## Background Information

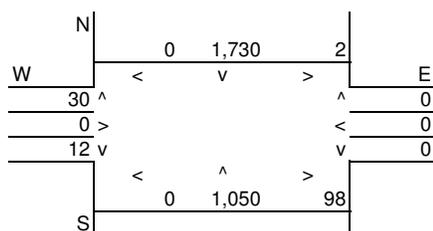
Nearest Air Monitoring Station measuring CO: Mission Viejo - 26081 Via Pera  
 Background 1-hour CO Concentration (ppm): 3.0  
 Background 8-hour CO Concentration (ppm): 1.5  
 Persistence Factor: 0.8  
 Analysis Year: 2030

## Roadway Data

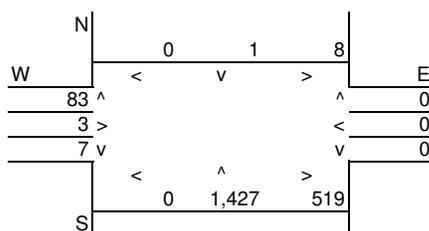
Intersection: Portola Pkwy at SR-241 SB Ramps  
 Analysis Condition: Year 2030 Traffic Volumes - Landowner Concept Plan

	Roadway Type	No. of Lanes	Average Speed		
			A.M.	P.M.	
North-South Roadway:	Portola Pkwy	At Grade	6	20	20
East-West Roadway:	SR-241 SB Ramps	At Grade	2	20	20

### A.M. Peak Hour Traffic Volumes



### P.M. Peak Hour Traffic Volumes



### Highest Traffic Volumes (Vehicles per Hour)

N-S Road:	2,890	N-S Road:	1,954
E-W Road:	100	E-W Road:	530

## Roadway CO Contributions and Concentrations

Emissions = (A x B x C) / 100,000<sup>1</sup>

Roadway	A <sub>1</sub>	A <sub>2</sub>	A <sub>3</sub>	B	C	Estimated CO Concentrations		
	Reference CO Concentrations 25 Feet	50 Feet	100 Feet	Traffic Volume	Emission Factors <sup>2</sup>	25 Feet	50 Feet	100 Feet
<b>A.M. Peak Traffic Hour</b>								
North-South Road	6.1	4.9	3.5	2,890	1.09	0.19	0.15	0.11
East-West Road	2.7	2.2	1.7	100	1.09	0.00	0.00	0.00
<b>P.M. Peak Traffic Hour</b>								
North-South Road	6.1	4.9	3.5	1,954	1.09	0.13	0.10	0.07
East-West Road	2.7	2.2	1.7	530	1.09	0.02	0.01	0.01

<sup>1</sup> Methodology from Bay Area Air Quality Management District *BAAQMD CEQA Guidelines* (1996).

<sup>2</sup> Emission factors from EMFAC2002 (2003).

## Total Roadway CO Concentrations

Peak Hour Emissions = North-South Concentration + East-West Concentration + Background 1-hour Concentration<sup>2</sup>

8-Hour Emissions = ((Highest Peak Hour Concentration - Background 1-hour Concentration) x Persistence Factor) + Background 8-hour Concentration

	A.M. Peak Hour	P.M. Peak Hour	8-Hour
25 Feet from Roadway Edge	3.2	3.1	1.7
50 Feet from Roadway Edge	3.2	3.1	1.6
100 Feet from Roadway Edge	3.1	3.1	1.6

<sup>2</sup> Methodology from Bay Area Air Quality Management District *BAAQMD CEQA Guidelines* (1996).

# SIMPLIFIED CALINE4 CARBON MONOXIDE ANALYSIS

**Project Number:** 10953-00  
**Project Title:** City of Lake Forest Opportunities Study Program EIR

## Background Information

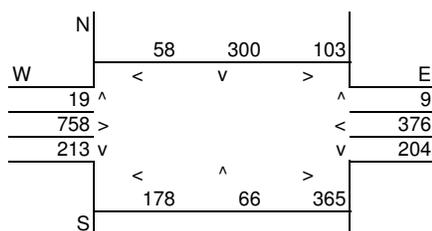
Nearest Air Monitoring Station measuring CO: Mission Viejo - 26081 Via Pera  
 Background 1-hour CO Concentration (ppm): 3.0  
 Background 8-hour CO Concentration (ppm): 1.5  
 Persistence Factor: 0.8  
 Analysis Year: 2030

## Roadway Data

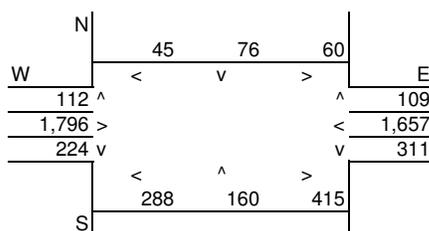
Intersection: Ridge Vly at Portola Pkwy  
 Analysis Condition: Year 2030 Traffic Volumes - Landowner Concept Plan

	Roadway Type	No. of Lanes	Average Speed		
			A.M.	P.M.	
North-South Roadway:	Ridge Vly.	At Grade	8	20	15
East-West Roadway:	Portola Pkwy.	At Grade	8	20	15

### A.M. Peak Hour Traffic Volumes



### P.M. Peak Hour Traffic Volumes



### Highest Traffic Volumes (Vehicles per Hour)

N-S Road:	1,326	N-S Road:	1,474
E-W Road:	1,815	E-W Road:	4,348

## Roadway CO Contributions and Concentrations

$$\text{Emissions} = (A \times B \times C) / 100,000^1$$

Roadway	A <sub>1</sub>	A <sub>2</sub>	A <sub>3</sub>	B	C	Estimated CO Concentrations		
	Reference CO Concentrations 25 Feet	50 Feet	100 Feet	Traffic Volume	Emission Factors <sup>2</sup>	25 Feet	50 Feet	100 Feet
<b>A.M. Peak Traffic Hour</b>								
North-South Road	2.2	1.9	1.6	1,326	1.09	0.03	0.03	0.02
East-West Road	5.7	4.6	3.4	1,815	1.09	0.11	0.09	0.07
<b>P.M. Peak Traffic Hour</b>								
North-South Road	2.2	1.9	1.6	1,474	1.23	0.04	0.03	0.03
East-West Road	5.7	4.6	3.4	4,348	1.23	0.30	0.25	0.18

<sup>1</sup> Methodology from Bay Area Air Quality Management District *BAAQMD CEQA Guidelines* (1996).

<sup>2</sup> Emission factors from EMFAC2002 (2003).

## Total Roadway CO Concentrations

$$\text{Peak Hour Emissions} = \text{North-South Concentration} + \text{East-West Concentration} + \text{Background 1-hour Concentration}^2$$

$$\text{8-Hour Emissions} = ((\text{Highest Peak Hour Concentration} - \text{Background 1-hour Concentration}) \times \text{Persistence Factor}) + \text{Background 8-hour Concentration}$$

	A.M. Peak Hour	P.M. Peak Hour	8-Hour
25 Feet from Roadway Edge	3.1	3.3	1.8
50 Feet from Roadway Edge	3.1	3.3	1.7
100 Feet from Roadway Edge	3.1	3.2	1.7

<sup>2</sup> Methodology from Bay Area Air Quality Management District *BAAQMD CEQA Guidelines* (1996).

# SIMPLIFIED CALINE4 CARBON MONOXIDE ANALYSIS

**Project Number:** 10953-00  
**Project Title:** City of Lake Forest Opportunities Study Program EIR

## Background Information

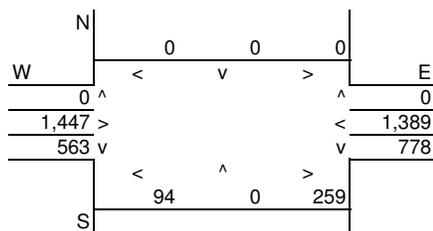
Nearest Air Monitoring Station measuring CO: Mission Viejo - 26081 Via Pera  
 Background 1-hour CO Concentration (ppm): 3.0  
 Background 8-hour CO Concentration (ppm): 1.5  
 Persistence Factor: 0.8  
 Analysis Year: 2030

## Roadway Data

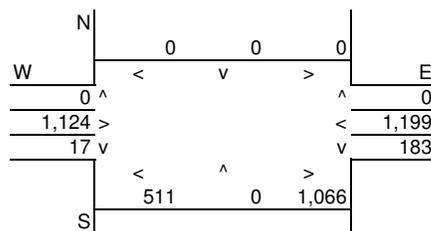
Intersection: Sand Cyn at Portola Pkwy  
 Analysis Condition: Year 2030 Traffic Volumes - Landowner Concept Plan

	Roadway Type	No. of Lanes	Average Speed		
			A.M.	P.M.	
North-South Roadway:	Sand Cyn.	At Grade	4	20	20
East-West Roadway:	Portola Pkwy.	At Grade	6	20	20

### A.M. Peak Hour Traffic Volumes



### P.M. Peak Hour Traffic Volumes



### Highest Traffic Volumes (Vehicles per Hour)

N-S Road:	1,694	N-S Road:	1,777
E-W Road:	3,873	E-W Road:	3,572

## Roadway CO Contributions and Concentrations

Emissions = (A x B x C) / 100,000<sup>1</sup>

Roadway	A <sub>1</sub>	A <sub>2</sub>	A <sub>3</sub>	B	C	Estimated CO Concentrations		
	Reference CO Concentrations 25 Feet	50 Feet	100 Feet	Traffic Volume	Emission Factors <sup>2</sup>	25 Feet	50 Feet	100 Feet
<b>A.M. Peak Traffic Hour</b>								
North-South Road	2.6	2.2	1.7	1,694	1.09	0.05	0.04	0.03
East-West Road	6.1	4.9	3.5	3,873	1.09	0.26	0.21	0.15
<b>P.M. Peak Traffic Hour</b>								
North-South Road	2.6	2.2	1.7	1,777	1.09	0.05	0.04	0.03
East-West Road	6.1	4.9	3.5	3,572	1.09	0.24	0.19	0.14

<sup>1</sup> Methodology from Bay Area Air Quality Management District *BAAQMD CEQA Guidelines* (1996).

<sup>2</sup> Emission factors from EMFAC2002 (2003).

## Total Roadway CO Concentrations

Peak Hour Emissions = North-South Concentration + East-West Concentration + Background 1-hour Concentration<sup>2</sup>

8-Hour Emissions = ((Highest Peak Hour Concentration - Background 1-hour Concentration) x Persistence Factor) + Background 8-hour Concentration

	A.M. Peak Hour	P.M. Peak Hour	8-Hour
25 Feet from Roadway Edge	3.3	3.3	1.7
50 Feet from Roadway Edge	3.2	3.2	1.7
100 Feet from Roadway Edge	3.2	3.2	1.6

<sup>2</sup> Methodology from Bay Area Air Quality Management District *BAAQMD CEQA Guidelines* (1996).

# SIMPLIFIED CALINE4 CARBON MONOXIDE ANALYSIS

Project Number: 10953-00  
 Project Title: City of Lake Forest Opportunities Study Program EIR

## Background Information

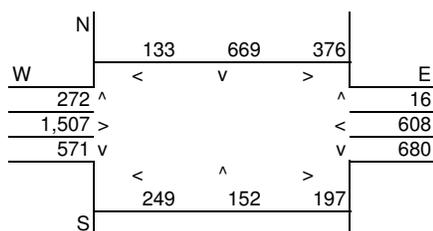
Nearest Air Monitoring Station measuring CO: Mission Viejo - 26081 Via Pera  
 Background 1-hour CO Concentration (ppm): 3.0  
 Background 8-hour CO Concentration (ppm): 1.5  
 Persistence Factor: 0.8  
 Analysis Year: 2030

## Roadway Data

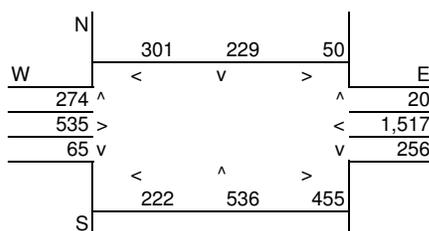
Intersection: Jeffrey Rd at Portola Pkwy  
 Analysis Condition: Year 2030 Traffic Volumes - Landowner Concept Plan

	Roadway Type	No. of Lanes	Average Speed		
			A.M.	P.M.	
North-South Roadway:	Jerrey Rd.	At Grade	8	20	20
East-West Roadway:	Portola Pkwy.	At Grade	8	20	20

### A.M. Peak Hour Traffic Volumes



### P.M. Peak Hour Traffic Volumes



### Highest Traffic Volumes (Vehicles per Hour)

N-S Road: 2,518  
 E-W Road: 3,384  
 N-S Road: 1,763  
 E-W Road: 2,914

## Roadway CO Contributions and Concentrations

$$\text{Emissions} = (A \times B \times C) / 100,000^1$$

Roadway	Reference CO Concentrations			B Traffic Volume	C Emission Factors <sup>2</sup>	Estimated CO Concentrations		
	A <sub>1</sub> 25 Feet	A <sub>2</sub> 50 Feet	A <sub>3</sub> 100 Feet			25 Feet	50 Feet	100 Feet
A.M. Peak Traffic Hour								
North-South Road	2.2	1.9	1.6	2,518	1.09	0.06	0.05	0.04
East-West Road	5.7	4.6	3.4	3,384	1.09	0.21	0.17	0.13
P.M. Peak Traffic Hour								
North-South Road	2.2	1.9	1.6	1,763	1.09	0.04	0.04	0.03
East-West Road	5.7	4.6	3.4	2,914	1.09	0.18	0.15	0.11

<sup>1</sup> Methodology from Bay Area Air Quality Management District *BAAQMD CEQA Guidelines* (1996).

<sup>2</sup> Emission factors from EMFAC2002 (2003).

## Total Roadway CO Concentrations

$$\text{Peak Hour Emissions} = \text{North-South Concentration} + \text{East-West Concentration} + \text{Background 1-hour Concentration}^2$$

$$\text{8-Hour Emissions} = ((\text{Highest Peak Hour Concentration} - \text{Background 1-hour Concentration}) \times \text{Persistence Factor}) + \text{Background 8-hour Concentration}$$

	A.M. Peak Hour	P.M. Peak Hour	8-Hour
25 Feet from Roadway Edge	3.3	3.2	1.7
50 Feet from Roadway Edge	3.2	3.2	1.7
100 Feet from Roadway Edge	3.2	3.1	1.6

<sup>2</sup> Methodology from Bay Area Air Quality Management District *BAAQMD CEQA Guidelines* (1996).

# SIMPLIFIED CALINE4 CARBON MONOXIDE ANALYSIS

Project Number: 10953-00  
 Project Title: City of Lake Forest Opportunities Study Program EIR

## Background Information

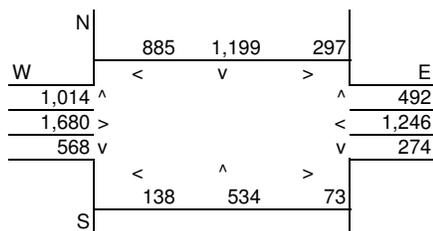
Nearest Air Monitoring Station measuring CO: Mission Viejo - 26081 Via Pera  
 Background 1-hour CO Concentration (ppm): 3.0  
 Background 8-hour CO Concentration (ppm): 1.5  
 Persistence Factor: 0.8  
 Analysis Year: 2030

## Roadway Data

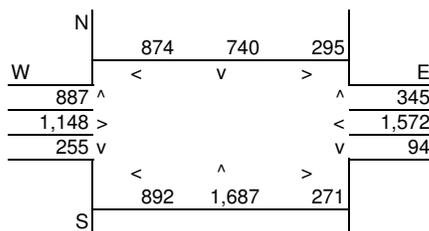
Intersection: Alton Pkwy at Irvine Bl  
 Analysis Condition: Year 2030 Traffic Volumes - Landowner Concept Plan

	Roadway Type	No. of Lanes	Average Speed		
			A.M.	P.M.	
North-South Roadway:	Alton Pkwy	At Grade	8	15	5
East-West Roadway:	Irvine Bl	At Grade	8	15	5

### A.M. Peak Hour Traffic Volumes



### P.M. Peak Hour Traffic Volumes



### Highest Traffic Volumes (Vehicles per Hour)

N-S Road: 4,421                      N-S Road: 4,828  
 E-W Road: 5,531                      E-W Road: 5,628

## Roadway CO Contributions and Concentrations

Emissions = (A x B x C) / 100,000<sup>1</sup>

Roadway	A <sub>1</sub>	A <sub>2</sub>	A <sub>3</sub>	B	C	Estimated CO Concentrations		
	Reference CO Concentrations 25 Feet	50 Feet	100 Feet	Traffic Volume	Emission Factors <sup>2</sup>	25 Feet	50 Feet	100 Feet
<b>A.M. Peak Traffic Hour</b>								
North-South Road	2.2	1.9	1.6	4,421	1.23	0.12	0.10	0.09
East-West Road	5.7	4.6	3.4	5,531	1.23	0.39	0.31	0.23
<b>P.M. Peak Traffic Hour</b>								
North-South Road	2.2	1.9	1.6	4,828	1.65	0.18	0.15	0.13
East-West Road	5.7	4.6	3.4	5,628	1.65	0.53	0.43	0.32

<sup>1</sup> Methodology from Bay Area Air Quality Management District *BAAQMD CEQA Guidelines* (1996).

<sup>2</sup> Emission factors from EMFAC2002 (2003).

## Total Roadway CO Concentrations

Peak Hour Emissions = North-South Concentration + East-West Concentration + Background 1-hour Concentration<sup>2</sup>

8-Hour Emissions = ((Highest Peak Hour Concentration - Background 1-hour Concentration) x Persistence Factor) + Background 8-hour Concentration

	A.M. Peak Hour	P.M. Peak Hour	8-Hour
25 Feet from Roadway Edge	3.5	3.7	2.1
50 Feet from Roadway Edge	3.4	3.6	2.0
100 Feet from Roadway Edge	3.3	3.4	1.9

<sup>2</sup> Methodology from Bay Area Air Quality Management District *BAAQMD CEQA Guidelines* (1996).





# SIMPLIFIED CALINE4 CARBON MONOXIDE ANALYSIS

**Project Number:** 10953-00  
**Project Title:** City of Lake Forest Opportunities Study Program EIR

## Background Information

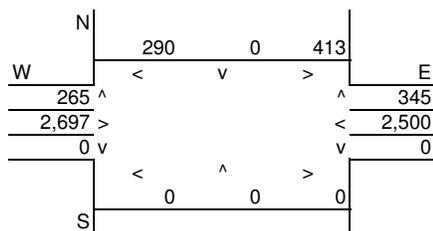
Nearest Air Monitoring Station measuring CO: Mission Viejo - 26081 Via Pera  
 Background 1-hour CO Concentration (ppm): 3.0  
 Background 8-hour CO Concentration (ppm): 1.5  
 Persistence Factor: 0.8  
 Analysis Year: 2030

## Roadway Data

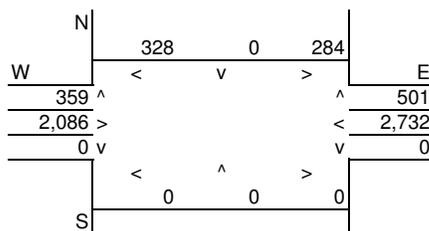
Intersection: Ridge Vly at Irvine Bl.  
 Analysis Condition: Year 2030 Traffic Volumes - Landowner Concept Plan

	Roadway Type	No. of Lanes	Average Speed	
			A.M.	P.M.
North-South Roadway:	Ridge Vly.	4	20	15
East-West Roadway:	Irvine Bl.	8	20	15

### A.M. Peak Hour Traffic Volumes



### P.M. Peak Hour Traffic Volumes



### Highest Traffic Volumes (Vehicles per Hour)

N-S Road: 1,313                      N-S Road: 1,472  
 E-W Road: 5,955                      E-W Road: 5,603

## Roadway CO Contributions and Concentrations

Emissions = (A x B x C) / 100,000<sup>1</sup>

Roadway	A <sub>1</sub>	A <sub>2</sub>	A <sub>3</sub>	B	C	Estimated CO Concentrations		
	Reference CO Concentrations 25 Feet	50 Feet	100 Feet	Traffic Volume	Emission Factors <sup>2</sup>	25 Feet	50 Feet	100 Feet
<b>A.M. Peak Traffic Hour</b>								
North-South Road	2.6	2.2	1.7	1,313	1.09	0.04	0.03	0.02
East-West Road	5.7	4.6	3.4	5,955	1.09	0.37	0.30	0.22
<b>P.M. Peak Traffic Hour</b>								
North-South Road	2.6	2.2	1.7	1,472	1.23	0.05	0.04	0.03
East-West Road	5.7	4.6	3.4	5,603	1.23	0.39	0.32	0.23

<sup>1</sup> Methodology from Bay Area Air Quality Management District *BAAQMD CEQA Guidelines* (1996).

<sup>2</sup> Emission factors from EMFAC2002 (2003).

## Total Roadway CO Concentrations

Peak Hour Emissions = North-South Concentration + East-West Concentration + Background 1-hour Concentration<sup>2</sup>

8-Hour Emissions = ((Highest Peak Hour Concentration - Background 1-hour Concentration) x Persistence Factor) + Background 8-hour Concentration

	A.M. Peak Hour	P.M. Peak Hour	8-Hour
25 Feet from Roadway Edge	3.4	3.4	1.9
50 Feet from Roadway Edge	3.3	3.4	1.8
100 Feet from Roadway Edge	3.2	3.3	1.7

<sup>2</sup> Methodology from Bay Area Air Quality Management District *BAAQMD CEQA Guidelines* (1996).



# SIMPLIFIED CALINE4 CARBON MONOXIDE ANALYSIS

**Project Number:** 10953-00  
**Project Title:** City of Lake Forest Opportunities Study Program EIR

## Background Information

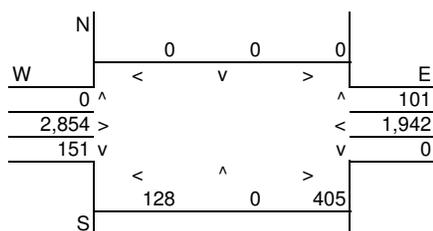
Nearest Air Monitoring Station measuring CO: Mission Viejo - 26081 Via Pera  
 Background 1-hour CO Concentration (ppm): 3.0  
 Background 8-hour CO Concentration (ppm): 1.5  
 Persistence Factor: 0.8  
 Analysis Year: 2030

## Roadway Data

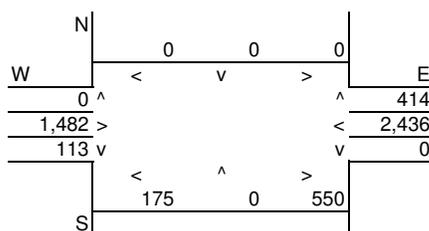
Intersection: ETC E. Leg NB Ramps at Irvine Bl.  
 Analysis Condition: Year 2030 Traffic Volumes - Landowner Concept Plan

	Roadway Type	No. of Lanes	Average Speed		
			A.M.	P.M.	
North-South Roadway:	ETC E. Leg NB Ramps	At Grade	2	15	20
East-West Roadway:	Irvine Bl.	At Grade	6	15	20

### A.M. Peak Hour Traffic Volumes



### P.M. Peak Hour Traffic Volumes



### Highest Traffic Volumes (Vehicles per Hour)

N-S Road:	684	N-S Road:	838
E-W Road:	5,302	E-W Road:	4,882

## Roadway CO Contributions and Concentrations

Emissions = (A x B x C) / 100,000<sup>1</sup>

Roadway	A <sub>1</sub>	A <sub>2</sub>	A <sub>3</sub>	B	C	Estimated CO Concentrations		
	Reference CO Concentrations 25 Feet	50 Feet	100 Feet	Traffic Volume	Emission Factors <sup>2</sup>	25 Feet	50 Feet	100 Feet
<b>A.M. Peak Traffic Hour</b>								
North-South Road	2.7	2.2	1.7	684	1.23	0.02	0.02	0.01
East-West Road	6.1	4.9	3.5	5,302	1.23	0.40	0.32	0.23
<b>P.M. Peak Traffic Hour</b>								
North-South Road	2.7	2.2	1.7	838	1.09	0.02	0.02	0.02
East-West Road	6.1	4.9	3.5	4,882	1.09	0.32	0.26	0.19

<sup>1</sup> Methodology from Bay Area Air Quality Management District *BAAQMD CEQA Guidelines* (1996).

<sup>2</sup> Emission factors from EMFAC2002 (2003).

## Total Roadway CO Concentrations

Peak Hour Emissions = North-South Concentration + East-West Concentration + Background 1-hour Concentration<sup>2</sup>

8-Hour Emissions = ((Highest Peak Hour Concentration - Background 1-hour Concentration) x Persistence Factor) + Background 8-hour Concentration

	A.M. Peak Hour	P.M. Peak Hour	8-Hour
25 Feet from Roadway Edge	3.4	3.3	1.8
50 Feet from Roadway Edge	3.3	3.3	1.8
100 Feet from Roadway Edge	3.2	3.2	1.7

<sup>2</sup> Methodology from Bay Area Air Quality Management District *BAAQMD CEQA Guidelines* (1996).

# SIMPLIFIED CALINE4 CARBON MONOXIDE ANALYSIS

Project Number: 10953-00  
 Project Title: City of Lake Forest Opportunities Study Program EIR

## Background Information

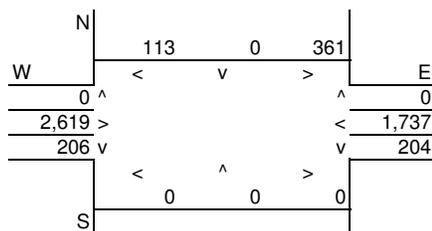
Nearest Air Monitoring Station measuring CO: Mission Viejo - 26081 Via Pera  
 Background 1-hour CO Concentration (ppm): 3.0  
 Background 8-hour CO Concentration (ppm): 1.5  
 Persistence Factor: 0.8  
 Analysis Year: 2030

## Roadway Data

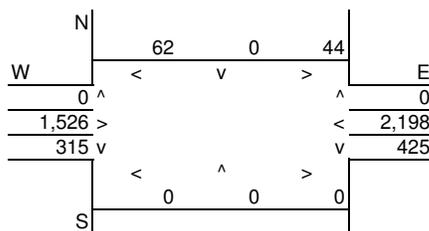
Intersection: ETC E. Leg SB Ramps at Irvine Bl.  
 Analysis Condition: Year 2030 Traffic Volumes - Landowner Concept Plan

	Roadway Type	No. of Lanes	Average Speed	
			A.M.	P.M.
North-South Roadway:	ETC E. Leg SB Ramps	4	20	20
East-West Roadway:	Irvine Bl.	8	20	20

### A.M. Peak Hour Traffic Volumes



### P.M. Peak Hour Traffic Volumes



### Highest Traffic Volumes (Vehicles per Hour)

N-S Road:	474	N-S Road:	740
E-W Road:	4,921	E-W Road:	4,193

## Roadway CO Contributions and Concentrations

$$\text{Emissions} = (A \times B \times C) / 100,000^1$$

Roadway	A <sub>1</sub>	A <sub>2</sub>	A <sub>3</sub>	B	C	Estimated CO Concentrations		
	Reference CO Concentrations 25 Feet	50 Feet	100 Feet	Traffic Volume	Emission Factors <sup>2</sup>	25 Feet	50 Feet	100 Feet
<b>A.M. Peak Traffic Hour</b>								
North-South Road	2.6	2.2	1.7	474	1.09	0.01	0.01	0.01
East-West Road	5.7	4.6	3.4	4,921	1.09	0.31	0.25	0.18
<b>P.M. Peak Traffic Hour</b>								
North-South Road	2.6	2.2	1.7	740	1.09	0.02	0.02	0.01
East-West Road	5.7	4.6	3.4	4,193	1.09	0.26	0.21	0.16

<sup>1</sup> Methodology from Bay Area Air Quality Management District *BAAQMD CEQA Guidelines* (1996).

<sup>2</sup> Emission factors from EMFAC2002 (2003).

## Total Roadway CO Concentrations

$$\text{Peak Hour Emissions} = \text{North-South Concentration} + \text{East-West Concentration} + \text{Background 1-hour Concentration}^2$$

$$\text{8-Hour Emissions} = ((\text{Highest Peak Hour Concentration} - \text{Background 1-hour Concentration}) \times \text{Persistence Factor}) + \text{Background 8-hour Concentration}$$

	A.M. Peak Hour	P.M. Peak Hour	8-Hour
25 Feet from Roadway Edge	3.3	3.3	1.8
50 Feet from Roadway Edge	3.3	3.2	1.7
100 Feet from Roadway Edge	3.2	3.2	1.7

<sup>2</sup> Methodology from Bay Area Air Quality Management District *BAAQMD CEQA Guidelines* (1996).

# SIMPLIFIED CALINE4 CARBON MONOXIDE ANALYSIS

Project Number: 10953-00  
 Project Title: City of Lake Forest Opportunities Study Program EIR

## Background Information

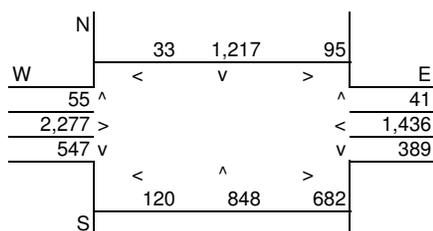
Nearest Air Monitoring Station measuring CO: Mission Viejo - 26081 Via Pera  
 Background 1-hour CO Concentration (ppm): 3.0  
 Background 8-hour CO Concentration (ppm): 1.5  
 Persistence Factor: 0.8  
 Analysis Year: 2030

## Roadway Data

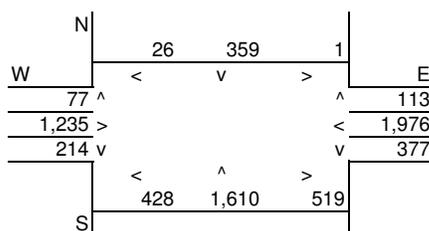
Intersection: Sand Cyn at Irvine Bl.  
 Analysis Condition: Year 2030 Traffic Volumes - Landowner Concept Plan

	Roadway Type	No. of Lanes	Average Speed		
			A.M.	P.M.	
North-South Roadway:	Sand Cyn.	At Grade	8	15	20
East-West Roadway:	Irvine Bl.	At Grade	8	15	20

### A.M. Peak Hour Traffic Volumes



### P.M. Peak Hour Traffic Volumes



### Highest Traffic Volumes (Vehicles per Hour)

N-S Road: 3,803                      N-S Road: 3,507  
 E-W Road: 4,920                      E-W Road: 4,221

## Roadway CO Contributions and Concentrations

Emissions = (A x B x C) / 100,000<sup>1</sup>

Roadway	A <sub>1</sub>	A <sub>2</sub>	A <sub>3</sub>	B	C	Estimated CO Concentrations		
	Reference CO Concentrations 25 Feet	50 Feet	100 Feet	Traffic Volume	Emission Factors <sup>2</sup>	25 Feet	50 Feet	100 Feet
<b>A.M. Peak Traffic Hour</b>								
North-South Road	2.2	1.9	1.6	3,803	1.23	0.10	0.09	0.07
East-West Road	5.7	4.6	3.4	4,920	1.23	0.34	0.28	0.21
<b>P.M. Peak Traffic Hour</b>								
North-South Road	2.2	1.9	1.6	3,507	1.09	0.08	0.07	0.06
East-West Road	5.7	4.6	3.4	4,221	1.09	0.26	0.21	0.16

<sup>1</sup> Methodology from Bay Area Air Quality Management District *BAAQMD CEQA Guidelines* (1996).

<sup>2</sup> Emission factors from EMFAC2002 (2003).

## Total Roadway CO Concentrations

Peak Hour Emissions = North-South Concentration + East-West Concentration + Background 1-hour Concentration<sup>2</sup>

8-Hour Emissions = ((Highest Peak Hour Concentration - Background 1-hour Concentration) x Persistence Factor) + Background 8-hour Concentration

	A.M. Peak Hour	P.M. Peak Hour	8-Hour
25 Feet from Roadway Edge	3.4	3.3	1.9
50 Feet from Roadway Edge	3.4	3.3	1.8
100 Feet from Roadway Edge	3.3	3.2	1.7

<sup>2</sup> Methodology from Bay Area Air Quality Management District *BAAQMD CEQA Guidelines* (1996).

# SIMPLIFIED CALINE4 CARBON MONOXIDE ANALYSIS

Project Number: 10953-00  
 Project Title: City of Lake Forest Opportunities Study Program EIR

## Background Information

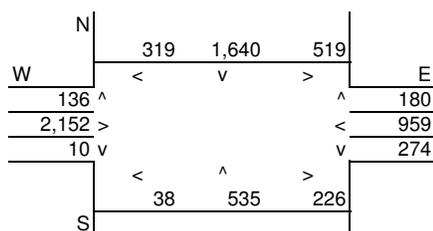
Nearest Air Monitoring Station measuring CO: Mission Viejo - 26081 Via Pera  
 Background 1-hour CO Concentration (ppm): 3.0  
 Background 8-hour CO Concentration (ppm): 1.5  
 Persistence Factor: 0.8  
 Analysis Year: 2030

## Roadway Data

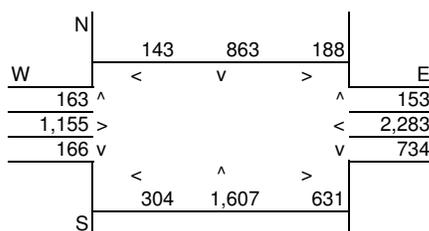
Intersection: Jeffrey Rd. at Irvine Bl.  
 Analysis Condition: Year 2030 Traffic Volumes - Landowner Concept Plan

	Roadway Type	No. of Lanes	Average Speed		
			A.M.	P.M.	
North-South Roadway:	Jeffrey Rd.	At Grade	8	15	15
East-West Roadway:	Irvine Bl.	At Grade	8	15	15

### A.M. Peak Hour Traffic Volumes



### P.M. Peak Hour Traffic Volumes



### Highest Traffic Volumes (Vehicles per Hour)

N-S Road: 3,329                      N-S Road: 4,305  
 E-W Road: 4,310                      E-W Road: 5,144

## Roadway CO Contributions and Concentrations

Emissions = (A x B x C) / 100,000<sup>1</sup>

Roadway	A <sub>1</sub>	A <sub>2</sub>	A <sub>3</sub>	B	C	Estimated CO Concentrations		
	Reference CO Concentrations 25 Feet	50 Feet	100 Feet	Traffic Volume	Emission Factors <sup>2</sup>	25 Feet	50 Feet	100 Feet
A.M. Peak Traffic Hour								
North-South Road	2.2	1.9	1.6	3,329	1.23	0.09	0.08	0.07
East-West Road	5.7	4.6	3.4	4,310	1.23	0.30	0.24	0.18
P.M. Peak Traffic Hour								
North-South Road	2.2	1.9	1.6	4,305	1.23	0.12	0.10	0.08
East-West Road	5.7	4.6	3.4	5,144	1.23	0.36	0.29	0.22

<sup>1</sup> Methodology from Bay Area Air Quality Management District *BAAQMD CEQA Guidelines* (1996).

<sup>2</sup> Emission factors from EMFAC2002 (2003).

## Total Roadway CO Concentrations

Peak Hour Emissions = North-South Concentration + East-West Concentration + Background 1-hour Concentration<sup>2</sup>

8-Hour Emissions = ((Highest Peak Hour Concentration - Background 1-hour Concentration) x Persistence Factor) + Background 8-hour Concentration

	A.M. Peak Hour	P.M. Peak Hour	8-Hour
25 Feet from Roadway Edge	3.4	3.5	1.9
50 Feet from Roadway Edge	3.3	3.4	1.8
100 Feet from Roadway Edge	3.2	3.3	1.7

<sup>2</sup> Methodology from Bay Area Air Quality Management District *BAAQMD CEQA Guidelines* (1996).



# SIMPLIFIED CALINE4 CARBON MONOXIDE ANALYSIS

**Project Number:** 10953-00  
**Project Title:** City of Lake Forest Opportunities Study Program EIR

## Background Information

Nearest Air Monitoring Station measuring CO: Mission Viejo - 26081 Via Pera  
 Background 1-hour CO Concentration (ppm): 3.0  
 Background 8-hour CO Concentration (ppm): 1.5  
 Persistence Factor: 0.8  
 Analysis Year: 2030

## Roadway Data

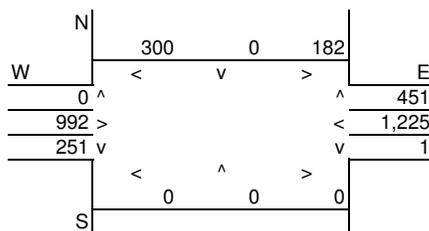
Intersection: SR-133 SB Ramps at Trabuco Rd.  
 Analysis Condition: Year 2030 Traffic Volumes - Landowner Concept Plan

	Roadway Type	No. of Lanes	Average Speed	
			A.M.	P.M.
North-South Roadway:	SR-133 SB Ramps	4	20	20
East-West Roadway:	Trabuco Rd.	4	20	20

### A.M. Peak Hour Traffic Volumes



### P.M. Peak Hour Traffic Volumes



### Highest Traffic Volumes (Vehicles per Hour)

N-S Road:	1,360	N-S Road:	933
E-W Road:	2,720	E-W Road:	2,851

## Roadway CO Contributions and Concentrations

Emissions = (A x B x C) / 100,000<sup>1</sup>

Roadway	A <sub>1</sub>	A <sub>2</sub>	A <sub>3</sub>	B	C	Estimated CO Concentrations		
	Reference CO Concentrations 25 Feet	50 Feet	100 Feet	Traffic Volume	Emission Factors <sup>2</sup>	25 Feet	50 Feet	100 Feet
<b>A.M. Peak Traffic Hour</b>								
North-South Road	2.6	2.2	1.7	1,360	1.09	0.04	0.03	0.03
East-West Road	7.0	5.4	3.8	2,720	1.09	0.21	0.16	0.11
<b>P.M. Peak Traffic Hour</b>								
North-South Road	2.6	2.2	1.7	933	1.09	0.03	0.02	0.02
East-West Road	7.0	5.4	3.8	2,851	1.09	0.22	0.17	0.12

<sup>1</sup> Methodology from Bay Area Air Quality Management District *BAAQMD CEQA Guidelines* (1996).

<sup>2</sup> Emission factors from EMFAC2002 (2003).

## Total Roadway CO Concentrations

Peak Hour Emissions = North-South Concentration + East-West Concentration + Background 1-hour Concentration<sup>2</sup>

8-Hour Emissions = ((Highest Peak Hour Concentration - Background 1-hour Concentration) x Persistence Factor) + Background 8-hour Concentration

	A.M. Peak Hour	P.M. Peak Hour	8-Hour
25 Feet from Roadway Edge	3.2	3.2	1.7
50 Feet from Roadway Edge	3.2	3.2	1.7
100 Feet from Roadway Edge	3.1	3.1	1.6

<sup>2</sup> Methodology from Bay Area Air Quality Management District *BAAQMD CEQA Guidelines* (1996).





# SIMPLIFIED CALINE4 CARBON MONOXIDE ANALYSIS

**Project Number:** 10953-00  
**Project Title:** City of Lake Forest Opportunities Study Program EIR

## Background Information

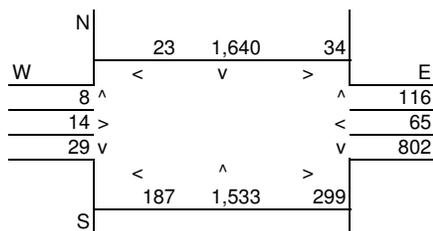
Nearest Air Monitoring Station measuring CO: Mission Viejo - 26081 Via Pera  
 Background 1-hour CO Concentration (ppm): 3.0  
 Background 8-hour CO Concentration (ppm): 1.5  
 Persistence Factor: 0.8  
 Analysis Year: 2030

## Roadway Data

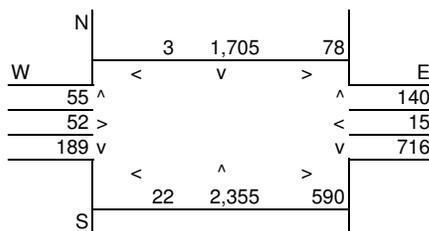
Intersection: Alton Pkwy at Jeronimo Rd  
 Analysis Condition: Year 2030 Traffic Volumes - Landowner Concept Plan

	Roadway Type	No. of Lanes	Average Speed		
			A.M.	P.M.	
North-South Roadway:	Alton Pkwy.	At Grade	8	20	20
East-West Roadway:	Jeronimo Rd.	At Grade	6	20	20

### A.M. Peak Hour Traffic Volumes



### P.M. Peak Hour Traffic Volumes



### Highest Traffic Volumes (Vehicles per Hour)

N-S Road: 4,490                      N-S Road: 5,577  
 E-W Road: 1,330                    E-W Road: 1,591

## Roadway CO Contributions and Concentrations

Emissions = (A x B x C) / 100,000<sup>1</sup>

Roadway	A <sub>1</sub>	A <sub>2</sub>	A <sub>3</sub>	B	C	Estimated CO Concentrations		
	Reference CO Concentrations 25 Feet	50 Feet	100 Feet	Traffic Volume	Emission Factors <sup>2</sup>	25 Feet	50 Feet	100 Feet
<b>A.M. Peak Traffic Hour</b>								
North-South Road	5.7	4.6	3.4	4,490	1.09	0.28	0.23	0.17
East-West Road	2.3	2.0	1.7	1,330	1.09	0.03	0.03	0.02
<b>P.M. Peak Traffic Hour</b>								
North-South Road	5.7	4.6	3.4	5,577	1.09	0.35	0.28	0.21
East-West Road	2.3	2.0	1.7	1,591	1.09	0.04	0.03	0.03

<sup>1</sup> Methodology from Bay Area Air Quality Management District *BAAQMD CEQA Guidelines* (1996).

<sup>2</sup> Emission factors from EMFAC2002 (2003).

## Total Roadway CO Concentrations

Peak Hour Emissions = North-South Concentration + East-West Concentration + Background 1-hour Concentration<sup>2</sup>

8-Hour Emissions = ((Highest Peak Hour Concentration - Background 1-hour Concentration) x Persistence Factor) + Background 8-hour Concentration

	A.M. Peak Hour	P.M. Peak Hour	8-Hour
25 Feet from Roadway Edge	3.3	3.4	1.8
50 Feet from Roadway Edge	3.3	3.3	1.8
100 Feet from Roadway Edge	3.2	3.2	1.7

<sup>2</sup> Methodology from Bay Area Air Quality Management District *BAAQMD CEQA Guidelines* (1996).

# SIMPLIFIED CALINE4 CARBON MONOXIDE ANALYSIS

Project Number: 10953-00  
 Project Title: City of Lake Forest Opportunities Study Program EIR

## Background Information

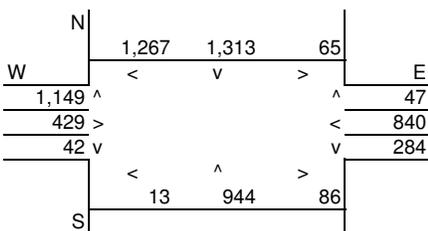
Nearest Air Monitoring Station measuring CO: Mission Viejo - 26081 Via Pera  
 Background 1-hour CO Concentration (ppm): 3.0  
 Background 8-hour CO Concentration (ppm): 1.5  
 Persistence Factor: 0.8  
 Analysis Year: 2030

## Roadway Data

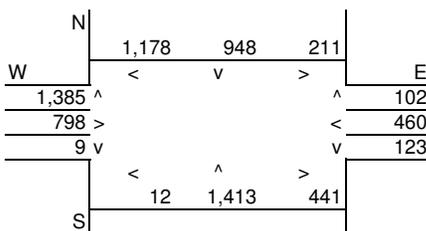
Intersection: Alton Pkwy at Muirlands Bl  
 Analysis Condition: Year 2030 Traffic Volumes - Landowner Concept Plan

	Roadway Type	No. of Lanes	Average Speed		
			A.M.	P.M.	
North-South Roadway:	Alton Pkwy.	At Grade	8	15	15
East-West Roadway:	Muirlands Bl.	At Grade	8	15	15

### A.M. Peak Hour Traffic Volumes



### P.M. Peak Hour Traffic Volumes



### Highest Traffic Volumes (Vehicles per Hour)

N-S Road: 4,785  
 E-W Road: 3,740  
 N-S Road: 5,237  
 E-W Road: 3,842

## Roadway CO Contributions and Concentrations

$$\text{Emissions} = (A \times B \times C) / 100,000^1$$

Roadway	A <sub>1</sub>	A <sub>2</sub>	A <sub>3</sub>	B	C	Estimated CO Concentrations		
	Reference CO Concentrations 25 Feet	50 Feet	100 Feet	Traffic Volume	Emission Factors <sup>2</sup>	25 Feet	50 Feet	100 Feet
A.M. Peak Traffic Hour								
North-South Road	5.7	4.6	3.4	4,785	1.23	0.34	0.27	0.20
East-West Road	2.2	1.9	1.6	3,740	1.23	0.10	0.09	0.07
P.M. Peak Traffic Hour								
North-South Road	5.7	4.6	3.4	5,237	1.23	0.37	0.30	0.22
East-West Road	2.2	1.9	1.6	3,842	1.23	0.10	0.09	0.08

<sup>1</sup> Methodology from Bay Area Air Quality Management District *BAAQMD CEQA Guidelines* (1996).

<sup>2</sup> Emission factors from EMFAC2002 (2003).

## Total Roadway CO Concentrations

$$\text{Peak Hour Emissions} = \text{North-South Concentration} + \text{East-West Concentration} + \text{Background 1-hour Concentration}^2$$

$$\text{8-Hour Emissions} = ((\text{Highest Peak Hour Concentration} - \text{Background 1-hour Concentration}) \times \text{Persistence Factor}) + \text{Background 8-hour Concentration}$$

	A.M. Peak Hour	P.M. Peak Hour	8-Hour
25 Feet from Roadway Edge	3.4	3.5	1.9
50 Feet from Roadway Edge	3.4	3.4	1.8
100 Feet from Roadway Edge	3.3	3.3	1.7

<sup>2</sup> Methodology from Bay Area Air Quality Management District *BAAQMD CEQA Guidelines* (1996).

# SIMPLIFIED CALINE4 CARBON MONOXIDE ANALYSIS

Project Number: 10953-00  
 Project Title: City of Lake Forest Opportunities Study Program EIR

## Background Information

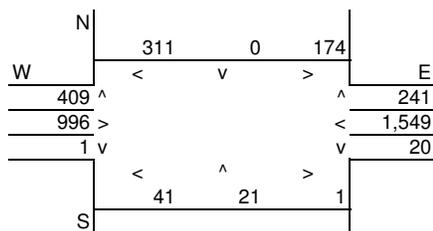
Nearest Air Monitoring Station measuring CO: Mission Viejo - 26081 Via Pera  
 Background 1-hour CO Concentration (ppm): 3.0  
 Background 8-hour CO Concentration (ppm): 1.5  
 Persistence Factor: 0.8  
 Analysis Year: 2030

## Roadway Data

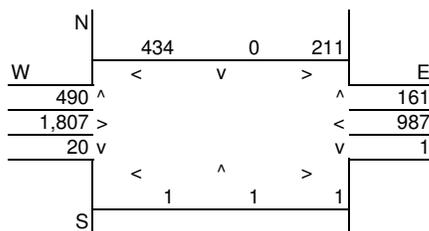
Intersection: Marine Wy at Alton Pk  
 Analysis Condition: Year 2030 Traffic Volumes - Landowner Concept Plan

	Roadway Type	No. of Lanes	Average Speed		
			A.M.	P.M.	
North-South Roadway:	Marine Wy.	At Grade	8	20	20
East-West Roadway:	Alton Pk.	At Grade	8	20	20

### A.M. Peak Hour Traffic Volumes



### P.M. Peak Hour Traffic Volumes



### Highest Traffic Volumes (Vehicles per Hour)

N-S Road: 1,156                      N-S Road: 1,297  
 E-W Road: 3,307                      E-W Road: 3,739

## Roadway CO Contributions and Concentrations

Emissions = (A x B x C) / 100,000<sup>1</sup>

Roadway	A <sub>1</sub>	A <sub>2</sub>	A <sub>3</sub>	B	C	Estimated CO Concentrations		
	Reference CO Concentrations 25 Feet	50 Feet	100 Feet	Traffic Volume	Emission Factors <sup>2</sup>	25 Feet	50 Feet	100 Feet
A.M. Peak Traffic Hour								
North-South Road	2.2	1.9	1.6	1,156	1.09	0.03	0.02	0.02
East-West Road	5.7	4.6	3.4	3,307	1.09	0.21	0.17	0.12
P.M. Peak Traffic Hour								
North-South Road	2.2	1.9	1.6	1,297	1.09	0.03	0.03	0.02
East-West Road	5.7	4.6	3.4	3,739	1.09	0.23	0.19	0.14

<sup>1</sup> Methodology from Bay Area Air Quality Management District *BAAQMD CEQA Guidelines* (1996).

<sup>2</sup> Emission factors from EMFAC2002 (2003).

## Total Roadway CO Concentrations

Peak Hour Emissions = North-South Concentration + East-West Concentration + Background 1-hour Concentration<sup>2</sup>

8-Hour Emissions = ((Highest Peak Hour Concentration - Background 1-hour Concentration) x Persistence Factor) + Background 8-hour Concentration

	A.M. Peak Hour	P.M. Peak Hour	8-Hour
25 Feet from Roadway Edge	3.2	3.3	1.7
50 Feet from Roadway Edge	3.2	3.2	1.7
100 Feet from Roadway Edge	3.1	3.2	1.6

<sup>2</sup> Methodology from Bay Area Air Quality Management District *BAAQMD CEQA Guidelines* (1996).



# SIMPLIFIED CALINE4 CARBON MONOXIDE ANALYSIS

Project Number: 10953-00  
 Project Title: City of Lake Forest Opportunities Study Program EIR

## Background Information

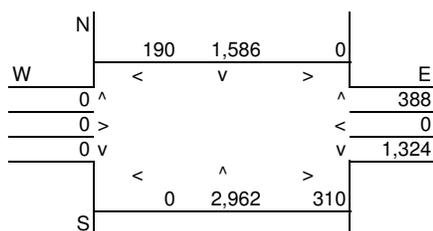
Nearest Air Monitoring Station measuring CO: Mission Viejo - 26081 Via Pera  
 Background 1-hour CO Concentration (ppm): 3.0  
 Background 8-hour CO Concentration (ppm): 1.5  
 Persistence Factor: 0.8  
 Analysis Year: 2030

## Roadway Data

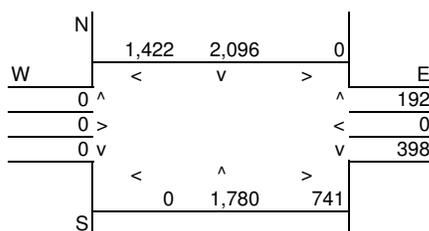
Intersection: Alton Pkwy at I-5 NB Ramps  
 Analysis Condition: Year 2030 Traffic Volumes - Landowner Concept Plan

	Roadway Type	No. of Lanes	Average Speed		
			A.M.	P.M.	
North-South Roadway:	Alton Pkwy.	At Grade	6	10	20
East-West Roadway:	I-5 NB Ramps	At Grade	4	10	20

### A.M. Peak Hour Traffic Volumes



### P.M. Peak Hour Traffic Volumes



### Highest Traffic Volumes (Vehicles per Hour)

N-S Road: 6,182                      N-S Road: 5,490  
 E-W Road: 2,022                    E-W Road: 1,422

## Roadway CO Contributions and Concentrations

Emissions = (A x B x C) / 100,000<sup>1</sup>

Roadway	A <sub>1</sub>	A <sub>2</sub>	A <sub>3</sub>	B	C	Estimated CO Concentrations		
	Reference CO Concentrations 25 Feet	50 Feet	100 Feet	Traffic Volume	Emission Factors <sup>2</sup>	25 Feet	50 Feet	100 Feet
A.M. Peak Traffic Hour								
North-South Road	6.1	4.9	3.5	6,182	1.41	0.53	0.43	0.31
East-West Road	2.6	2.2	1.7	2,022	1.41	0.07	0.06	0.05
P.M. Peak Traffic Hour								
North-South Road	6.1	4.9	3.5	5,490	1.09	0.37	0.29	0.21
East-West Road	2.6	2.2	1.7	1,422	1.09	0.04	0.03	0.03

<sup>1</sup> Methodology from Bay Area Air Quality Management District *BAAQMD CEQA Guidelines* (1996).

<sup>2</sup> Emission factors from EMFAC2002 (2003).

## Total Roadway CO Concentrations

Peak Hour Emissions = North-South Concentration + East-West Concentration + Background 1-hour Concentration<sup>2</sup>

8-Hour Emissions = ((Highest Peak Hour Concentration - Background 1-hour Concentration) x Persistence Factor) + Background 8-hour Concentration

	A.M. Peak Hour	P.M. Peak Hour	8-Hour
25 Feet from Roadway Edge	3.6	3.4	2.0
50 Feet from Roadway Edge	3.5	3.3	1.9
100 Feet from Roadway Edge	3.4	3.2	1.8

<sup>2</sup> Methodology from Bay Area Air Quality Management District *BAAQMD CEQA Guidelines* (1996).

# SIMPLIFIED CALINE4 CARBON MONOXIDE ANALYSIS

**Project Number:** 10953-00  
**Project Title:** City of Lake Forest Opportunities Study Program EIR

## Background Information

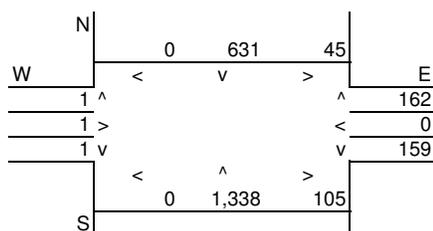
Nearest Air Monitoring Station measuring CO: Mission Viejo - 26081 Via Pera  
 Background 1-hour CO Concentration (ppm): 3.0  
 Background 8-hour CO Concentration (ppm): 1.5  
 Persistence Factor: 0.8  
 Analysis Year: 2030

## Roadway Data

Intersection: Marine Wy at Rockfield  
 Analysis Condition: Year 2030 Traffic Volumes - Landowner Concept Plan

	Roadway Type	No. of Lanes	Average Speed		
			A.M.	P.M.	
North-South Roadway:	Marine Wy.	At Grade	6	20	20
East-West Roadway:	Rockfield	At Grade	4	20	20

### A.M. Peak Hour Traffic Volumes



### P.M. Peak Hour Traffic Volumes



### Highest Traffic Volumes (Vehicles per Hour)

N-S Road:	2,234	N-S Road:	2,673
E-W Road:	472	E-W Road:	993

## Roadway CO Contributions and Concentrations

Emissions = (A x B x C) / 100,000<sup>1</sup>

Roadway	A <sub>1</sub>	A <sub>2</sub>	A <sub>3</sub>	B	C	Estimated CO Concentrations		
	Reference CO Concentrations 25 Feet	50 Feet	100 Feet	Traffic Volume	Emission Factors <sup>2</sup>	25 Feet	50 Feet	100 Feet
<b>A.M. Peak Traffic Hour</b>								
North-South Road	6.1	4.9	3.5	2,234	1.09	0.15	0.12	0.09
East-West Road	2.6	2.2	1.7	472	1.09	0.01	0.01	0.01
<b>P.M. Peak Traffic Hour</b>								
North-South Road	6.1	4.9	3.5	2,673	1.09	0.18	0.14	0.10
East-West Road	2.6	2.2	1.7	993	1.09	0.03	0.02	0.02

<sup>1</sup> Methodology from Bay Area Air Quality Management District *BAAQMD CEQA Guidelines* (1996).

<sup>2</sup> Emission factors from EMFAC2002 (2003).

## Total Roadway CO Concentrations

Peak Hour Emissions = North-South Concentration + East-West Concentration + Background 1-hour Concentration<sup>2</sup>

8-Hour Emissions = ((Highest Peak Hour Concentration - Background 1-hour Concentration) x Persistence Factor) + Background 8-hour Concentration

	A.M. Peak Hour	P.M. Peak Hour	8-Hour
25 Feet from Roadway Edge	3.2	3.2	1.7
50 Feet from Roadway Edge	3.1	3.2	1.6
100 Feet from Roadway Edge	3.1	3.1	1.6

<sup>2</sup> Methodology from Bay Area Air Quality Management District *BAAQMD CEQA Guidelines* (1996).

# SIMPLIFIED CALINE4 CARBON MONOXIDE ANALYSIS

Project Number: 10953-00  
 Project Title: City of Lake Forest Opportunities Study Program EIR

## Background Information

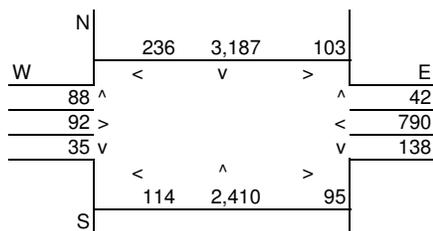
Nearest Air Monitoring Station measuring CO: Mission Viejo - 26081 Via Pera  
 Background 1-hour CO Concentration (ppm): 3.0  
 Background 8-hour CO Concentration (ppm): 1.5  
 Persistence Factor: 0.8  
 Analysis Year: 2030

## Roadway Data

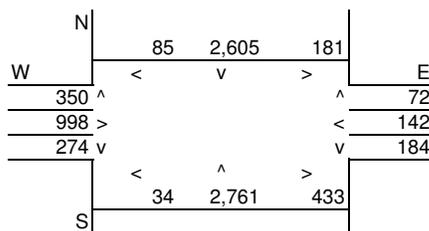
Intersection: Bake Pkwy at Muirlands  
 Analysis Condition: Year 2030 Traffic Volumes - Landowner Concept Plan

	Roadway Type	No. of Lanes	Average Speed		
			A.M.	P.M.	
North-South Roadway:	Bake Pkwy.	At Grade	8	15	15
East-West Roadway:	Muirlands	At Grade	8	15	15

### A.M. Peak Hour Traffic Volumes



### P.M. Peak Hour Traffic Volumes



### Highest Traffic Volumes (Vehicles per Hour)

N-S Road: 6,066  
 E-W Road: 1,355

N-S Road: 6,291  
 E-W Road: 2,010

## Roadway CO Contributions and Concentrations

$$\text{Emissions} = (A \times B \times C) / 100,000^1$$

Roadway	A <sub>1</sub>	A <sub>2</sub>	A <sub>3</sub>	B	C	Estimated CO Concentrations		
	Reference CO Concentrations 25 Feet	50 Feet	100 Feet	Traffic Volume	Emission Factors <sup>2</sup>	25 Feet	50 Feet	100 Feet
<b>A.M. Peak Traffic Hour</b>								
North-South Road	5.7	4.6	3.4	6,066	1.23	0.43	0.34	0.25
East-West Road	2.2	1.9	1.6	1,355	1.23	0.04	0.03	0.03
<b>P.M. Peak Traffic Hour</b>								
North-South Road	5.7	4.6	3.4	6,291	1.23	0.44	0.36	0.26
East-West Road	2.2	1.9	1.6	2,010	1.23	0.05	0.05	0.04

<sup>1</sup> Methodology from Bay Area Air Quality Management District *BAAQMD CEQA Guidelines* (1996).

<sup>2</sup> Emission factors from EMFAC2002 (2003).

## Total Roadway CO Concentrations

$$\text{Peak Hour Emissions} = \text{North-South Concentration} + \text{East-West Concentration} + \text{Background 1-hour Concentration}^2$$

$$\text{8-Hour Emissions} = ((\text{Highest Peak Hour Concentration} - \text{Background 1-hour Concentration}) \times \text{Persistence Factor}) + \text{Background 8-hour Concentration}$$

	A.M. Peak Hour	P.M. Peak Hour	8-Hour
25 Feet from Roadway Edge	3.5	3.5	1.9
50 Feet from Roadway Edge	3.4	3.4	1.8
100 Feet from Roadway Edge	3.3	3.3	1.7

<sup>2</sup> Methodology from Bay Area Air Quality Management District *BAAQMD CEQA Guidelines* (1996).

# SIMPLIFIED CALINE4 CARBON MONOXIDE ANALYSIS

**Project Number:** 10953-00  
**Project Title:** City of Lake Forest Opportunities Study Program EIR

## Background Information

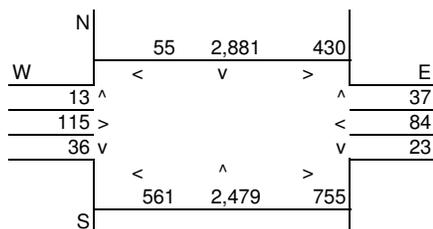
Nearest Air Monitoring Station measuring CO: Mission Viejo - 26081 Via Pera  
 Background 1-hour CO Concentration (ppm): 3.0  
 Background 8-hour CO Concentration (ppm): 1.5  
 Persistence Factor: 0.8  
 Analysis Year: 2030

## Roadway Data

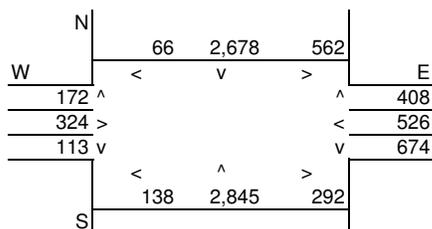
Intersection: Bake Pkwy at Rockfield Bl  
 Analysis Condition: Year 2030 Traffic Volumes - Landowner Concept Plan

	Roadway Type	No. of Lanes	Average Speed		
			A.M.	P.M.	
North-South Roadway:	Bake Pkwy.	At Grade	8	20	10
East-West Roadway:	Rockfield Bl.	At Grade	8	20	10

### A.M. Peak Hour Traffic Volumes



### P.M. Peak Hour Traffic Volumes



### Highest Traffic Volumes (Vehicles per Hour)

N-S Road: 6,735                      N-S Road: 6,740  
 E-W Road: 1,444                      E-W Road: 2,786

## Roadway CO Contributions and Concentrations

Emissions = (A x B x C) / 100,000<sup>1</sup>

Roadway	A <sub>1</sub>	A <sub>2</sub>	A <sub>3</sub>	B	C	Estimated CO Concentrations		
	Reference CO Concentrations 25 Feet	50 Feet	100 Feet	Traffic Volume	Emission Factors <sup>2</sup>	25 Feet	50 Feet	100 Feet
<b>A.M. Peak Traffic Hour</b>								
North-South Road	5.7	4.6	3.4	6,735	1.09	0.42	0.34	0.25
East-West Road	2.2	1.9	1.6	1,444	1.09	0.03	0.03	0.03
<b>P.M. Peak Traffic Hour</b>								
North-South Road	5.7	4.6	3.4	6,740	1.41	0.54	0.44	0.32
East-West Road	2.2	1.9	1.6	2,786	1.41	0.09	0.07	0.06

<sup>1</sup> Methodology from Bay Area Air Quality Management District *BAAQMD CEQA Guidelines* (1996).

<sup>2</sup> Emission factors from EMFAC2002 (2003).

## Total Roadway CO Concentrations

Peak Hour Emissions = North-South Concentration + East-West Concentration + Background 1-hour Concentration<sup>2</sup>

8-Hour Emissions = ((Highest Peak Hour Concentration - Background 1-hour Concentration) x Persistence Factor) + Background 8-hour Concentration

	A.M. Peak Hour	P.M. Peak Hour	8-Hour
25 Feet from Roadway Edge	3.5	3.6	2.0
50 Feet from Roadway Edge	3.4	3.5	1.9
100 Feet from Roadway Edge	3.3	3.4	1.8

<sup>2</sup> Methodology from Bay Area Air Quality Management District *BAAQMD CEQA Guidelines* (1996).





# SIMPLIFIED CALINE4 CARBON MONOXIDE ANALYSIS

**Project Number:** 10953-00  
**Project Title:** City of Lake Forest Opportunities Study Program EIR

## Background Information

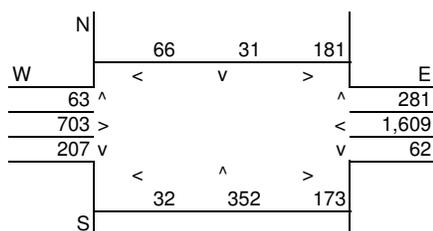
Nearest Air Monitoring Station measuring CO: Mission Viejo - 26081 Via Pera  
 Background 1-hour CO Concentration (ppm): 3.0  
 Background 8-hour CO Concentration (ppm): 1.5  
 Persistence Factor: 0.8  
 Analysis Year: 2030

## Roadway Data

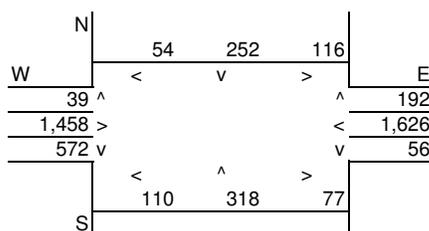
Intersection: Bake Pkwy at Irvine Center Dr.  
 Analysis Condition: Year 2030 Traffic Volumes - Landowner Concept Plan

	Roadway Type	No. of Lanes	Average Speed		
			A.M.	P.M.	
North-South Roadway:	Bake Pkwy.	At Grade	8	20	20
East-West Roadway:	Irvine Center Dr.	At Grade	8	20	20

### A.M. Peak Hour Traffic Volumes



### P.M. Peak Hour Traffic Volumes



### Highest Traffic Volumes (Vehicles per Hour)

N-S Road:	974	N-S Road:	1,385
E-W Road:	3,009	E-W Road:	3,859

## Roadway CO Contributions and Concentrations

$$\text{Emissions} = (A \times B \times C) / 100,000^1$$

Roadway	Reference CO Concentrations			B Traffic Volume	C Emission Factors <sup>2</sup>	Estimated CO Concentrations		
	A <sub>1</sub> 25 Feet	A <sub>2</sub> 50 Feet	A <sub>3</sub> 100 Feet			25 Feet	50 Feet	100 Feet
<b>A.M. Peak Traffic Hour</b>								
North-South Road	2.2	1.9	1.6	974	1.09	0.02	0.02	0.02
East-West Road	5.7	4.6	3.4	3,009	1.09	0.19	0.15	0.11
<b>P.M. Peak Traffic Hour</b>								
North-South Road	2.2	1.9	1.6	1,385	1.09	0.03	0.03	0.02
East-West Road	5.7	4.6	3.4	3,859	1.09	0.24	0.19	0.14

<sup>1</sup> Methodology from Bay Area Air Quality Management District *BAAQMD CEQA Guidelines* (1996).

<sup>2</sup> Emission factors from EMFAC2002 (2003).

## Total Roadway CO Concentrations

$$\text{Peak Hour Emissions} = \text{North-South Concentration} + \text{East-West Concentration} + \text{Background 1-hour Concentration}^2$$

$$\text{8-Hour Emissions} = ((\text{Highest Peak Hour Concentration} - \text{Background 1-hour Concentration}) \times \text{Persistence Factor}) + \text{Background 8-hour Concentration}$$

	A.M. Peak Hour	P.M. Peak Hour	8-Hour
25 Feet from Roadway Edge	3.2	3.3	1.7
50 Feet from Roadway Edge	3.2	3.2	1.7
100 Feet from Roadway Edge	3.1	3.2	1.6

<sup>2</sup> Methodology from Bay Area Air Quality Management District *BAAQMD CEQA Guidelines* (1996).



# SIMPLIFIED CALINE4 CARBON MONOXIDE ANALYSIS

**Project Number:** 10953-00  
**Project Title:** City of Lake Forest Opportunities Study Program EIR

## Background Information

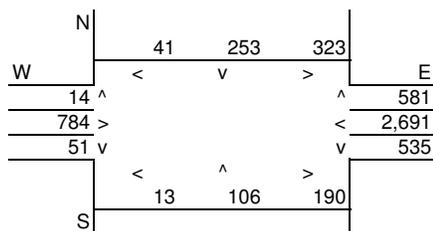
Nearest Air Monitoring Station measuring CO: Mission Viejo - 26081 Via Pera  
 Background 1-hour CO Concentration (ppm): 3.0  
 Background 8-hour CO Concentration (ppm): 1.5  
 Persistence Factor: 0.8  
 Analysis Year: 2030

## Roadway Data

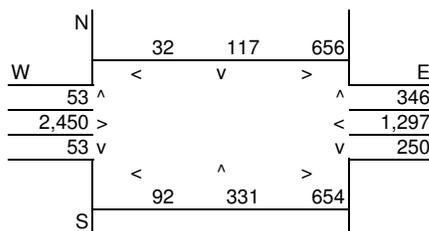
Intersection: Ridge Route at Mountain Pkwy.  
 Analysis Condition: Year 2030 Traffic Volumes - Landowner Concept Plan

	Roadway Type	No. of Lanes	Average Speed		
			A.M.	P.M.	
North-South Roadway:	Ridge Route	At Grade	8	20	5
East-West Roadway:	Mountain Pkwy.	At Grade	8	20	5

### A.M. Peak Hour Traffic Volumes



### P.M. Peak Hour Traffic Volumes



### Highest Traffic Volumes (Vehicles per Hour)

N-S Road:	1,318	N-S Road:	1,535
E-W Road:	5,104	E-W Road:	5,653

## Roadway CO Contributions and Concentrations

Emissions = (A x B x C) / 100,000<sup>1</sup>

Roadway	A <sub>1</sub>	A <sub>2</sub>	A <sub>3</sub>	B	C	Estimated CO Concentrations		
	Reference CO Concentrations 25 Feet	50 Feet	100 Feet	Traffic Volume	Emission Factors <sup>2</sup>	25 Feet	50 Feet	100 Feet
<b>A.M. Peak Traffic Hour</b>								
North-South Road	2.2	1.9	1.6	1,318	1.09	0.03	0.03	0.02
East-West Road	5.7	4.6	3.4	5,104	1.09	0.32	0.26	0.19
<b>P.M. Peak Traffic Hour</b>								
North-South Road	2.2	1.9	1.6	1,535	1.65	0.06	0.05	0.04
East-West Road	5.7	4.6	3.4	5,653	1.65	0.53	0.43	0.32

<sup>1</sup> Methodology from Bay Area Air Quality Management District *BAAQMD CEQA Guidelines* (1996).

<sup>2</sup> Emission factors from EMFAC2002 (2003).

## Total Roadway CO Concentrations

Peak Hour Emissions = North-South Concentration + East-West Concentration + Background 1-hour Concentration<sup>2</sup>

8-Hour Emissions = ((Highest Peak Hour Concentration - Background 1-hour Concentration) x Persistence Factor) + Background 8-hour Concentration

	A.M. Peak Hour	P.M. Peak Hour	8-Hour
25 Feet from Roadway Edge	3.3	3.6	2.0
50 Feet from Roadway Edge	3.3	3.5	1.9
100 Feet from Roadway Edge	3.2	3.4	1.8

<sup>2</sup> Methodology from Bay Area Air Quality Management District *BAAQMD CEQA Guidelines* (1996).

# SIMPLIFIED CALINE4 CARBON MONOXIDE ANALYSIS

**Project Number:** 10953-00  
**Project Title:** City of Lake Forest Opportunities Study Program EIR

## Background Information

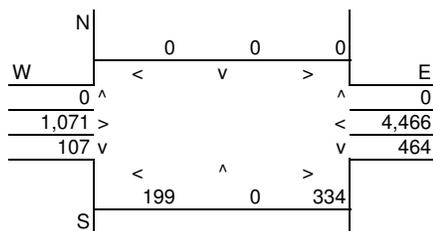
Nearest Air Monitoring Station measuring CO: Mission Viejo - 26081 Via Pera  
 Background 1-hour CO Concentration (ppm): 3.0  
 Background 8-hour CO Concentration (ppm): 1.5  
 Persistence Factor: 0.8  
 Analysis Year: 2030

## Roadway Data

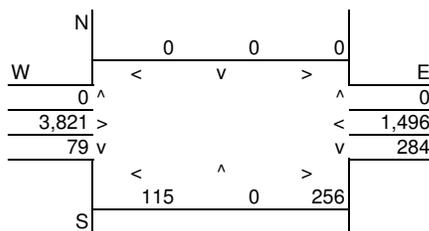
Intersection: Santa Maria Ave. at Moulton Pkwy.  
 Analysis Condition: Year 2030 Traffic Volumes - Landowner Concept Plan

	Roadway Type	No. of Lanes	Average Speed		
			A.M.	P.M.	
North-South Roadway:	Santa Maria Ave.	At Grade	4	10	10
East-West Roadway:	Moulton Pkwy.	At Grade	8	10	10

### A.M. Peak Hour Traffic Volumes



### P.M. Peak Hour Traffic Volumes



### Highest Traffic Volumes (Vehicles per Hour)

N-S Road:	1,104	N-S Road:	734
E-W Road:	6,335	E-W Road:	5,857

## Roadway CO Contributions and Concentrations

Emissions = (A x B x C) / 100,000<sup>1</sup>

Roadway	A <sub>1</sub>	A <sub>2</sub>	A <sub>3</sub>	B	C	Estimated CO Concentrations		
	Reference CO Concentrations 25 Feet	50 Feet	100 Feet	Traffic Volume	Emission Factors <sup>2</sup>	25 Feet	50 Feet	100 Feet
<b>A.M. Peak Traffic Hour</b>								
North-South Road	2.6	2.2	1.7	1,104	1.41	0.04	0.03	0.03
East-West Road	5.7	4.6	3.4	6,335	1.41	0.51	0.41	0.30
<b>P.M. Peak Traffic Hour</b>								
North-South Road	2.6	2.2	1.7	734	1.41	0.03	0.02	0.02
East-West Road	5.7	4.6	3.4	5,857	1.41	0.47	0.38	0.28

<sup>1</sup> Methodology from Bay Area Air Quality Management District *BAAQMD CEQA Guidelines* (1996).

<sup>2</sup> Emission factors from EMFAC2002 (2003).

## Total Roadway CO Concentrations

Peak Hour Emissions = North-South Concentration + East-West Concentration + Background 1-hour Concentration<sup>2</sup>

8-Hour Emissions = ((Highest Peak Hour Concentration - Background 1-hour Concentration) x Persistence Factor) + Background 8-hour Concentration

	A.M. Peak Hour	P.M. Peak Hour	8-Hour
25 Feet from Roadway Edge	3.5	3.5	1.9
50 Feet from Roadway Edge	3.4	3.4	1.9
100 Feet from Roadway Edge	3.3	3.3	1.8

<sup>2</sup> Methodology from Bay Area Air Quality Management District *BAAQMD CEQA Guidelines* (1996).

# SIMPLIFIED CALINE4 CARBON MONOXIDE ANALYSIS

Project Number: 10953-00  
 Project Title: City of Lake Forest Opportunities Study Program EIR

## Background Information

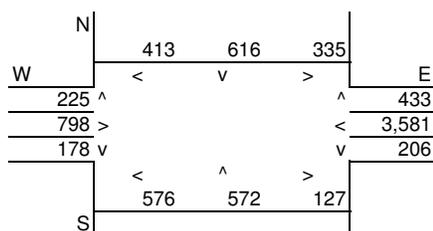
Nearest Air Monitoring Station measuring CO: Mission Viejo - 26081 Via Pera  
 Background 1-hour CO Concentration (ppm): 3.0  
 Background 8-hour CO Concentration (ppm): 1.5  
 Persistence Factor: 0.8  
 Analysis Year: 2030

## Roadway Data

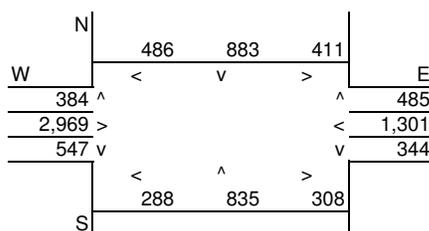
Intersection: El Toro Rd. at Moulton Pkwy.  
 Analysis Condition: Year 2030 Traffic Volumes - Landowner Concept Plan

	Roadway Type	No. of Lanes	Average Speed		
			A.M.	P.M.	
North-South Roadway:	El Toro Rd.	At Grade	8	5	5
East-West Roadway:	Moulton Pkwy.	At Grade	8	5	5

### A.M. Peak Hour Traffic Volumes



### P.M. Peak Hour Traffic Volumes



### Highest Traffic Volumes (Vehicles per Hour)

N-S Road: 2,594                      N-S Road: 3,484  
 E-W Road: 5,771                      E-W Road: 5,975

## Roadway CO Contributions and Concentrations

$$\text{Emissions} = (A \times B \times C) / 100,000^1$$

Roadway	A <sub>1</sub>	A <sub>2</sub>	A <sub>3</sub>	B	C	Estimated CO Concentrations		
	Reference CO Concentrations 25 Feet	50 Feet	100 Feet	Traffic Volume	Emission Factors <sup>2</sup>	25 Feet	50 Feet	100 Feet
<b>A.M. Peak Traffic Hour</b>								
North-South Road	2.2	1.9	1.6	2,594	1.65	0.09	0.08	0.07
East-West Road	5.7	4.6	3.4	5,771	1.65	0.54	0.44	0.32
<b>P.M. Peak Traffic Hour</b>								
North-South Road	2.2	1.9	1.6	3,484	1.65	0.13	0.11	0.09
East-West Road	5.7	4.6	3.4	5,975	1.65	0.56	0.45	0.34

<sup>1</sup> Methodology from Bay Area Air Quality Management District *BAAQMD CEQA Guidelines* (1996).

<sup>2</sup> Emission factors from EMFAC2002 (2003).

## Total Roadway CO Concentrations

$$\text{Peak Hour Emissions} = \text{North-South Concentration} + \text{East-West Concentration} + \text{Background 1-hour Concentration}^2$$

$$\text{8-Hour Emissions} = ((\text{Highest Peak Hour Concentration} - \text{Background 1-hour Concentration}) \times \text{Persistence Factor}) + \text{Background 8-hour Concentration}$$

	A.M. Peak Hour	P.M. Peak Hour	8-Hour
25 Feet from Roadway Edge	3.6	3.7	2.1
50 Feet from Roadway Edge	3.5	3.6	2.0
100 Feet from Roadway Edge	3.4	3.4	1.8

<sup>2</sup> Methodology from Bay Area Air Quality Management District *BAAQMD CEQA Guidelines* (1996).

# SIMPLIFIED CALINE4 CARBON MONOXIDE ANALYSIS

**Project Number:** 10953-00  
**Project Title:** City of Lake Forest Opportunities Study Program EIR

## Background Information

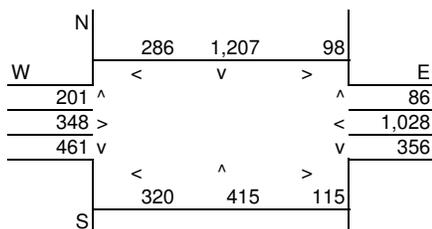
Nearest Air Monitoring Station measuring CO: Mission Viejo - 26081 Via Pera  
 Background 1-hour CO Concentration (ppm): 3.0  
 Background 8-hour CO Concentration (ppm): 1.5  
 Persistence Factor: 0.8  
 Analysis Year: 2030

## Roadway Data

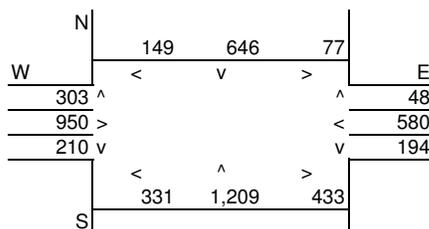
Intersection: Los Alisos Bl at Trabuco Rd  
 Analysis Condition: Year 2030 Traffic Volumes - Landowner Concept Plan

	Roadway Type	No. of Lanes	Average Speed		
			A.M.	P.M.	
North-South Roadway:	Los Alisos Bl.	At Grade	8	10	20
East-West Roadway:	Trabuco Rd.	At Grade	8	10	20

### A.M. Peak Hour Traffic Volumes



### P.M. Peak Hour Traffic Volumes



### Highest Traffic Volumes (Vehicles per Hour)

N-S Road: 2,874  
 E-W Road: 2,644  
 N-S Road: 3,023  
 E-W Road: 2,523

## Roadway CO Contributions and Concentrations

$$\text{Emissions} = (A \times B \times C) / 100,000^1$$

Roadway	Reference CO Concentrations			B Traffic Volume	C Emission Factors <sup>2</sup>	Estimated CO Concentrations		
	A <sub>1</sub> 25 Feet	A <sub>2</sub> 50 Feet	A <sub>3</sub> 100 Feet			25 Feet	50 Feet	100 Feet
<b>A.M. Peak Traffic Hour</b>								
North-South Road	5.7	4.6	3.4	2,874	1.41	0.23	0.19	0.14
East-West Road	2.2	1.9	1.6	2,644	1.41	0.08	0.07	0.06
<b>P.M. Peak Traffic Hour</b>								
North-South Road	5.7	4.6	3.4	3,023	1.09	0.19	0.15	0.11
East-West Road	2.2	1.9	1.6	2,523	1.09	0.06	0.05	0.04

<sup>1</sup> Methodology from Bay Area Air Quality Management District *BAAQMD CEQA Guidelines* (1996).

<sup>2</sup> Emission factors from EMFAC2002 (2003).

## Total Roadway CO Concentrations

$$\text{Peak Hour Emissions} = \text{North-South Concentration} + \text{East-West Concentration} + \text{Background 1-hour Concentration}^2$$

$$\text{8-Hour Emissions} = ((\text{Highest Peak Hour Concentration} - \text{Background 1-hour Concentration}) \times \text{Persistence Factor}) + \text{Background 8-hour Concentration}$$

	A.M. Peak Hour	P.M. Peak Hour	8-Hour
25 Feet from Roadway Edge	3.3	3.2	1.8
50 Feet from Roadway Edge	3.3	3.2	1.7
100 Feet from Roadway Edge	3.2	3.2	1.7

<sup>2</sup> Methodology from Bay Area Air Quality Management District *BAAQMD CEQA Guidelines* (1996).

# SIMPLIFIED CALINE4 CARBON MONOXIDE ANALYSIS

**Project Number:** 10953-00  
**Project Title:** City of Lake Forest Opportunities Study Program EIR

## Background Information

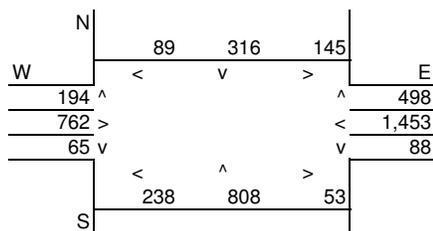
Nearest Air Monitoring Station measuring CO: Mission Viejo - 26081 Via Pera  
 Background 1-hour CO Concentration (ppm): 3.0  
 Background 8-hour CO Concentration (ppm): 1.5  
 Persistence Factor: 0.8  
 Analysis Year: 2030

## Roadway Data

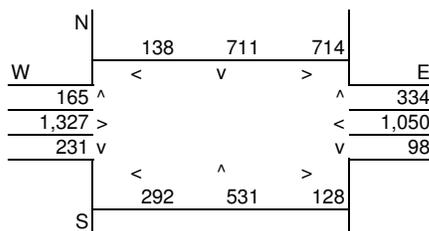
Intersection: Trabuco Rd. at Alicia Pkwy.  
 Analysis Condition: Year 2030 Traffic Volumes - Landowner Concept Plan

	Roadway Type	No. of Lanes	Average Speed		
			A.M.	P.M.	
North-South Roadway:	Trabuco Rd.	At Grade	8	20	10
East-West Roadway:	Alicia Pkwy.	At Grade	8	20	10

### A.M. Peak Hour Traffic Volumes



### P.M. Peak Hour Traffic Volumes



### Highest Traffic Volumes (Vehicles per Hour)

N-S Road: 2,050                      N-S Road: 2,593  
 E-W Road: 2,999                      E-W Road: 3,651

## Roadway CO Contributions and Concentrations

Emissions = (A x B x C) / 100,000<sup>1</sup>

Roadway	A <sub>1</sub>	A <sub>2</sub>	A <sub>3</sub>	B	C	Estimated CO Concentrations		
	Reference CO Concentrations 25 Feet	50 Feet	100 Feet	Traffic Volume	Emission Factors <sup>2</sup>	25 Feet	50 Feet	100 Feet
<b>A.M. Peak Traffic Hour</b>								
North-South Road	2.2	1.9	1.6	2,050	1.09	0.05	0.04	0.04
East-West Road	5.7	4.6	3.4	2,999	1.09	0.19	0.15	0.11
<b>P.M. Peak Traffic Hour</b>								
North-South Road	2.2	1.9	1.6	2,593	1.41	0.08	0.07	0.06
East-West Road	5.7	4.6	3.4	3,651	1.41	0.29	0.24	0.18

<sup>1</sup> Methodology from Bay Area Air Quality Management District *BAAQMD CEQA Guidelines* (1996).

<sup>2</sup> Emission factors from EMFAC2002 (2003).

## Total Roadway CO Concentrations

Peak Hour Emissions = North-South Concentration + East-West Concentration + Background 1-hour Concentration<sup>2</sup>

8-Hour Emissions = ((Highest Peak Hour Concentration - Background 1-hour Concentration) x Persistence Factor) + Background 8-hour Concentration

	A.M. Peak Hour	P.M. Peak Hour	8-Hour
25 Feet from Roadway Edge	3.2	3.4	1.8
50 Feet from Roadway Edge	3.2	3.3	1.7
100 Feet from Roadway Edge	3.1	3.2	1.7

<sup>2</sup> Methodology from Bay Area Air Quality Management District *BAAQMD CEQA Guidelines* (1996).



# SIMPLIFIED CALINE4 CARBON MONOXIDE ANALYSIS

**Project Number:** 10953-00  
**Project Title:** City of Lake Forest Opportunities Study Program EIR

## Background Information

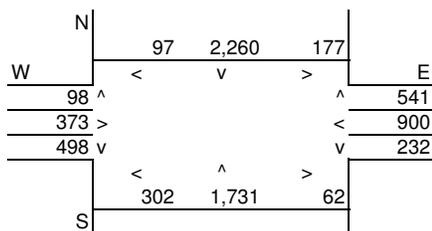
Nearest Air Monitoring Station measuring CO: Mission Viejo - 26081 Via Pera  
 Background 1-hour CO Concentration (ppm): 3.0  
 Background 8-hour CO Concentration (ppm): 1.5  
 Persistence Factor: 0.8  
 Analysis Year: 2030

## Roadway Data

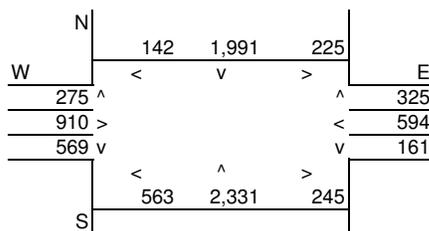
Intersection: Alicia Pkwy at Muirlands Bl  
 Analysis Condition: Year 2030 Traffic Volumes - Landowner Concept Plan

	Roadway Type	No. of Lanes	Average Speed		
			A.M.	P.M.	
North-South Roadway:	Alicia Pkwy.	At Grade	8	10	10
East-West Roadway:	Muirlands Bl.	At Grade	8	10	10

### A.M. Peak Hour Traffic Volumes



### P.M. Peak Hour Traffic Volumes



### Highest Traffic Volumes (Vehicles per Hour)

N-S Road: 5,085	N-S Road: 5,860
E-W Road: 2,285	E-W Road: 3,053

## Roadway CO Contributions and Concentrations

$$\text{Emissions} = (A \times B \times C) / 100,000^1$$

Roadway	Reference CO Concentrations			B Traffic Volume	C Emission Factors <sup>2</sup>	Estimated CO Concentrations		
	A <sub>1</sub> 25 Feet	A <sub>2</sub> 50 Feet	A <sub>3</sub> 100 Feet			25 Feet	50 Feet	100 Feet
<b>A.M. Peak Traffic Hour</b>								
North-South Road	5.7	4.6	3.4	5,085	1.41	0.41	0.33	0.24
East-West Road	2.2	1.9	1.6	2,285	1.41	0.07	0.06	0.05
<b>P.M. Peak Traffic Hour</b>								
North-South Road	5.7	4.6	3.4	5,860	1.41	0.47	0.38	0.28
East-West Road	2.2	1.9	1.6	3,053	1.41	0.09	0.08	0.07

<sup>1</sup> Methodology from Bay Area Air Quality Management District *BAAQMD CEQA Guidelines* (1996).

<sup>2</sup> Emission factors from EMFAC2002 (2003).

## Total Roadway CO Concentrations

$$\text{Peak Hour Emissions} = \text{North-South Concentration} + \text{East-West Concentration} + \text{Background 1-hour Concentration}^2$$

$$\text{8-Hour Emissions} = ((\text{Highest Peak Hour Concentration} - \text{Background 1-hour Concentration}) \times \text{Persistence Factor}) + \text{Background 8-hour Concentration}$$

	A.M. Peak Hour	P.M. Peak Hour	8-Hour
25 Feet from Roadway Edge	3.5	3.6	2.0
50 Feet from Roadway Edge	3.4	3.5	1.9
100 Feet from Roadway Edge	3.3	3.3	1.8

<sup>2</sup> Methodology from Bay Area Air Quality Management District *BAAQMD CEQA Guidelines* (1996).

# SIMPLIFIED CALINE4 CARBON MONOXIDE ANALYSIS

Project Number: 10953-00  
 Project Title: City of Lake Forest Opportunities Study Program EIR

## Background Information

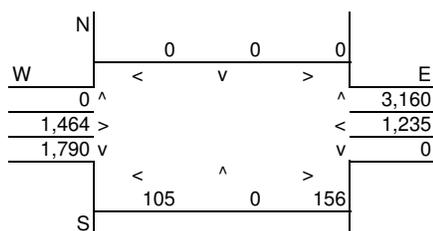
Nearest Air Monitoring Station measuring CO: Mission Viejo - 26081 Via Pera  
 Background 1-hour CO Concentration (ppm): 3.0  
 Background 8-hour CO Concentration (ppm): 1.5  
 Persistence Factor: 0.8  
 Analysis Year: 2030

## Roadway Data

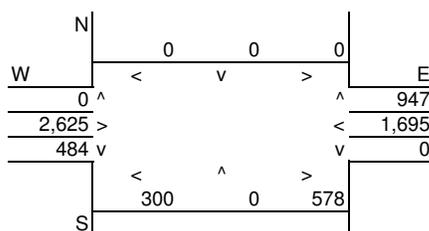
Intersection: I-5 NB Ramps at Alicia Pkwy.  
 Analysis Condition: Year 2030 Traffic Volumes - Landowner Concept Plan

	Roadway Type	No. of Lanes	Average Speed	
			A.M.	P.M.
North-South Roadway:	I-5 NB Ramps	4	20	20
East-West Roadway:	Alicia Pkwy.	6	20	20

### A.M. Peak Hour Traffic Volumes



### P.M. Peak Hour Traffic Volumes



### Highest Traffic Volumes (Vehicles per Hour)

A.M. Peak Hour:  
 N-S Road: 3,160  
 E-W Road: 6,015

P.M. Peak Hour:  
 N-S Road: 1,362  
 E-W Road: 5,845

## Roadway CO Contributions and Concentrations

$$\text{Emissions} = (A \times B \times C) / 100,000^1$$

Roadway	Reference CO Concentrations			B Traffic Volume	C Emission Factors <sup>2</sup>	Estimated CO Concentrations		
	A <sub>1</sub> 25 Feet	A <sub>2</sub> 50 Feet	A <sub>3</sub> 100 Feet			25 Feet	50 Feet	100 Feet
A.M. Peak Traffic Hour								
North-South Road	2.6	2.2	1.7	3,160	1.09	0.09	0.08	0.06
East-West Road	6.1	4.9	3.5	6,015	1.09	0.40	0.32	0.23
P.M. Peak Traffic Hour								
North-South Road	2.6	2.2	1.7	1,362	1.09	0.04	0.03	0.03
East-West Road	6.1	4.9	3.5	5,845	1.09	0.39	0.31	0.22

<sup>1</sup> Methodology from Bay Area Air Quality Management District *BAAQMD CEQA Guidelines* (1996).

<sup>2</sup> Emission factors from EMFAC2002 (2003).

## Total Roadway CO Concentrations

$$\text{Peak Hour Emissions} = \text{North-South Concentration} + \text{East-West Concentration} + \text{Background 1-hour Concentration}^2$$

$$\text{8-Hour Emissions} = ((\text{Highest Peak Hour Concentration} - \text{Background 1-hour Concentration}) \times \text{Persistence Factor}) + \text{Background 8-hour Concentration}$$

	A.M. Peak Hour	P.M. Peak Hour	8-Hour
25 Feet from Roadway Edge	3.5	3.4	1.9
50 Feet from Roadway Edge	3.4	3.3	1.8
100 Feet from Roadway Edge	3.3	3.2	1.7

<sup>2</sup> Methodology from Bay Area Air Quality Management District *BAAQMD CEQA Guidelines* (1996).

# SIMPLIFIED CALINE4 CARBON MONOXIDE ANALYSIS

**Project Number:** 10953-00  
**Project Title:** City of Lake Forest Opportunities Study Program EIR

## Background Information

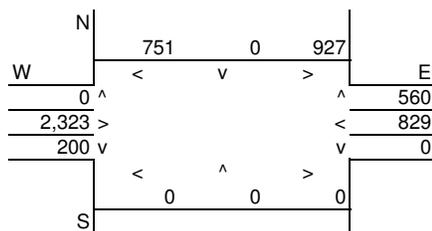
Nearest Air Monitoring Station measuring CO: Mission Viejo - 26081 Via Pera  
 Background 1-hour CO Concentration (ppm): 3.0  
 Background 8-hour CO Concentration (ppm): 1.5  
 Persistence Factor: 0.8  
 Analysis Year: 2030

## Roadway Data

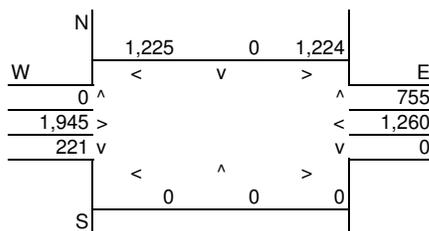
Intersection: I-5 SB Ramps at Alicia Pkwy.  
 Analysis Condition: Year 2030 Traffic Volumes - Landowner Concept Plan

	Roadway Type	No. of Lanes	Average Speed	
			A.M.	P.M.
North-South Roadway:	I-5 SB Ramps	4	20	20
East-West Roadway:	Alicia Pkwy.	6	20	20

### A.M. Peak Hour Traffic Volumes



### P.M. Peak Hour Traffic Volumes



### Highest Traffic Volumes (Vehicles per Hour)

N-S Road:	2,238	N-S Road:	3,204
E-W Road:	4,639	E-W Road:	5,184

## Roadway CO Contributions and Concentrations

$$\text{Emissions} = (A \times B \times C) / 100,000^1$$

Roadway	A <sub>1</sub>	A <sub>2</sub>	A <sub>3</sub>	B	C	Estimated CO Concentrations		
	Reference CO Concentrations 25 Feet	50 Feet	100 Feet	Traffic Volume	Emission Factors <sup>2</sup>	25 Feet	50 Feet	100 Feet
<b>A.M. Peak Traffic Hour</b>								
North-South Road	2.6	2.2	1.7	2,238	1.09	0.06	0.05	0.04
East-West Road	6.1	4.9	3.5	4,639	1.09	0.31	0.25	0.18
<b>P.M. Peak Traffic Hour</b>								
North-South Road	2.6	2.2	1.7	3,204	1.09	0.09	0.08	0.06
East-West Road	6.1	4.9	3.5	5,184	1.09	0.34	0.28	0.20

<sup>1</sup> Methodology from Bay Area Air Quality Management District *BAAQMD CEQA Guidelines* (1996).

<sup>2</sup> Emission factors from EMFAC2002 (2003).

## Total Roadway CO Concentrations

$$\text{Peak Hour Emissions} = \text{North-South Concentration} + \text{East-West Concentration} + \text{Background 1-hour Concentration}^2$$

$$\text{8-Hour Emissions} = ((\text{Highest Peak Hour Concentration} - \text{Background 1-hour Concentration}) \times \text{Persistence Factor}) + \text{Background 8-hour Concentration}$$

	A.M. Peak Hour	P.M. Peak Hour	8-Hour
25 Feet from Roadway Edge	3.4	3.4	1.8
50 Feet from Roadway Edge	3.3	3.4	1.8
100 Feet from Roadway Edge	3.2	3.3	1.7

<sup>2</sup> Methodology from Bay Area Air Quality Management District *BAAQMD CEQA Guidelines* (1996).

# SIMPLIFIED CALINE4 CARBON MONOXIDE ANALYSIS

**Project Number:** 10953-00  
**Project Title:** City of Lake Forest Opportunities Study Program EIR

## Background Information

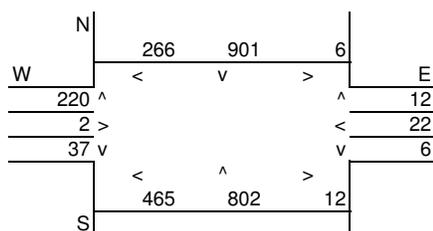
Nearest Air Monitoring Station measuring CO: Mission Viejo - 26081 Via Pera  
 Background 1-hour CO Concentration (ppm): 3.0  
 Background 8-hour CO Concentration (ppm): 1.5  
 Persistence Factor: 0.8  
 Analysis Year: 2030

## Roadway Data

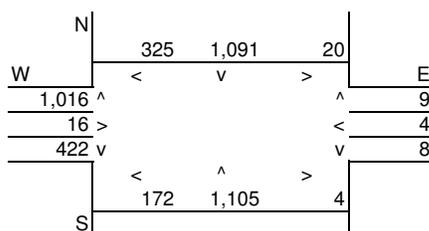
Intersection: Los Alisos Bl at Avd de la Carlota  
 Analysis Condition: Year 2030 Traffic Volumes - Landowner Concept Plan

	Roadway Type	No. of Lanes	Average Speed		
			A.M.	P.M.	
North-South Roadway:	Los Alisos Bl.	At Grade	8	20	20
East-West Roadway:	Avd de la Carlota	At Grade	6	20	20

### A.M. Peak Hour Traffic Volumes



### P.M. Peak Hour Traffic Volumes



### Highest Traffic Volumes (Vehicles per Hour)

N-S Road:	2,223	N-S Road:	3,566
E-W Road:	1,012	E-W Road:	1,955

## Roadway CO Contributions and Concentrations

Emissions = (A x B x C) / 100,000<sup>1</sup>

Roadway	A <sub>1</sub>	A <sub>2</sub>	A <sub>3</sub>	B	C	Estimated CO Concentrations		
	Reference CO Concentrations 25 Feet	50 Feet	100 Feet	Traffic Volume	Emission Factors <sup>2</sup>	25 Feet	50 Feet	100 Feet
<b>A.M. Peak Traffic Hour</b>								
North-South Road	5.7	4.6	3.4	2,223	1.09	0.14	0.11	0.08
East-West Road	2.3	2.0	1.7	1,012	1.09	0.03	0.02	0.02
<b>P.M. Peak Traffic Hour</b>								
North-South Road	5.7	4.6	3.4	3,566	1.09	0.22	0.18	0.13
East-West Road	2.3	2.0	1.7	1,955	1.09	0.05	0.04	0.04

<sup>1</sup> Methodology from Bay Area Air Quality Management District *BAAQMD CEQA Guidelines* (1996).

<sup>2</sup> Emission factors from EMFAC2002 (2003).

## Total Roadway CO Concentrations

Peak Hour Emissions = North-South Concentration + East-West Concentration + Background 1-hour Concentration<sup>2</sup>

8-Hour Emissions = ((Highest Peak Hour Concentration - Background 1-hour Concentration) x Persistence Factor) + Background 8-hour Concentration

	A.M. Peak Hour	P.M. Peak Hour	8-Hour
25 Feet from Roadway Edge	3.2	3.3	1.7
50 Feet from Roadway Edge	3.1	3.2	1.7
100 Feet from Roadway Edge	3.1	3.2	1.6

<sup>2</sup> Methodology from Bay Area Air Quality Management District *BAAQMD CEQA Guidelines* (1996).

# SIMPLIFIED CALINE4 CARBON MONOXIDE ANALYSIS

Project Number: 10953-00  
 Project Title: City of Lake Forest Opportunities Study Program EIR

## Background Information

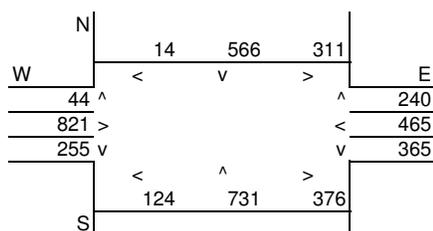
Nearest Air Monitoring Station measuring CO: Mission Viejo - 26081 Via Pera  
 Background 1-hour CO Concentration (ppm): 3.0  
 Background 8-hour CO Concentration (ppm): 1.5  
 Persistence Factor: 0.8  
 Analysis Year: 2030

## Roadway Data

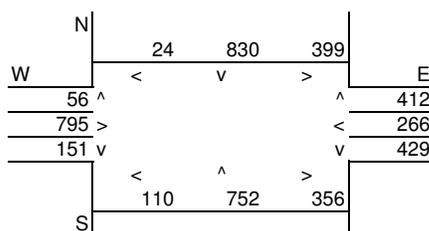
Intersection: El Toro Rd. at Paseo de Valencia  
 Analysis Condition: Year 2030 Traffic Volumes - Landowner Concept Plan

	Roadway Type	No. of Lanes	Average Speed		
			A.M.	P.M.	
North-South Roadway:	El Toro Rd.	At Grade	8	20	20
East-West Roadway:	Paseo de Valencia	At Grade	8	20	20

### A.M. Peak Hour Traffic Volumes



### P.M. Peak Hour Traffic Volumes



### Highest Traffic Volumes (Vehicles per Hour)

N-S Road:	2,417	N-S Road:	2,628
E-W Road:	2,578	E-W Road:	2,657

## Roadway CO Contributions and Concentrations

$$\text{Emissions} = (A \times B \times C) / 100,000^1$$

Roadway	Reference CO Concentrations			B Traffic Volume	C Emission Factors <sup>2</sup>	Estimated CO Concentrations		
	A <sub>1</sub> 25 Feet	A <sub>2</sub> 50 Feet	A <sub>3</sub> 100 Feet			25 Feet	50 Feet	100 Feet
A.M. Peak Traffic Hour								
North-South Road	2.2	1.9	1.6	2,417	1.09	0.06	0.05	0.04
East-West Road	5.7	4.6	3.4	2,578	1.09	0.16	0.13	0.10
P.M. Peak Traffic Hour								
North-South Road	2.2	1.9	1.6	2,628	1.09	0.06	0.05	0.05
East-West Road	5.7	4.6	3.4	2,657	1.09	0.17	0.13	0.10

<sup>1</sup> Methodology from Bay Area Air Quality Management District *BAAQMD CEQA Guidelines* (1996).

<sup>2</sup> Emission factors from EMFAC2002 (2003).

## Total Roadway CO Concentrations

$$\text{Peak Hour Emissions} = \text{North-South Concentration} + \text{East-West Concentration} + \text{Background 1-hour Concentration}^2$$

$$\text{8-Hour Emissions} = ((\text{Highest Peak Hour Concentration} - \text{Background 1-hour Concentration}) \times \text{Persistence Factor}) + \text{Background 8-hour Concentration}$$

	A.M. Peak Hour	P.M. Peak Hour	8-Hour
25 Feet from Roadway Edge	3.2	3.2	1.7
50 Feet from Roadway Edge	3.2	3.2	1.7
100 Feet from Roadway Edge	3.1	3.1	1.6

<sup>2</sup> Methodology from Bay Area Air Quality Management District *BAAQMD CEQA Guidelines* (1996).

# SIMPLIFIED CALINE4 CARBON MONOXIDE ANALYSIS

**Project Number:** 10953-00  
**Project Title:** City of Lake Forest Opportunities Study Program EIR

## Background Information

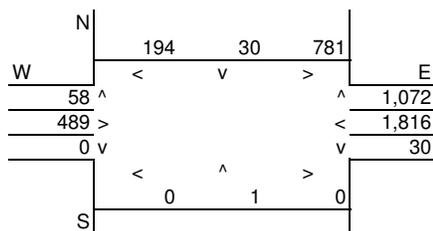
Nearest Air Monitoring Station measuring CO: Mission Viejo - 26081 Via Pera  
 Background 1-hour CO Concentration (ppm): 3.0  
 Background 8-hour CO Concentration (ppm): 1.5  
 Persistence Factor: 0.8  
 Analysis Year: 2030

## Roadway Data

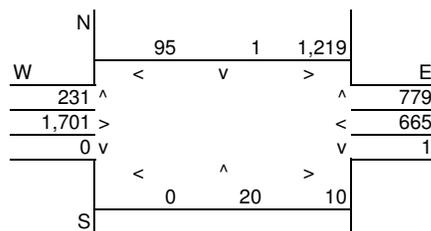
Intersection: Los Alisos Bl at Paseo de Valencia  
 Analysis Condition: Year 2030 Traffic Volumes - Landowner Concept Plan

	Roadway Type	No. of Lanes	Average Speed		
			A.M.	P.M.	
North-South Roadway:	Los Alisos Bl.	At Grade	4	20	20
East-West Roadway:	Paseo de Valencia	At Grade	8	20	20

### A.M. Peak Hour Traffic Volumes



### P.M. Peak Hour Traffic Volumes



### Highest Traffic Volumes (Vehicles per Hour)

N-S Road: 2,136  
 E-W Road: 4,188

N-S Road: 2,345  
 E-W Road: 4,375

## Roadway CO Contributions and Concentrations

$$\text{Emissions} = (A \times B \times C) / 100,000^1$$

Roadway	A <sub>1</sub>	A <sub>2</sub>	A <sub>3</sub>	B	C	Estimated CO Concentrations		
	Reference CO Concentrations 25 Feet	50 Feet	100 Feet	Traffic Volume	Emission Factors <sup>2</sup>	25 Feet	50 Feet	100 Feet
<b>A.M. Peak Traffic Hour</b>								
North-South Road	2.6	2.2	1.7	2,136	1.09	0.06	0.05	0.04
East-West Road	5.7	4.6	3.4	4,188	1.09	0.26	0.21	0.16
<b>P.M. Peak Traffic Hour</b>								
North-South Road	2.6	2.2	1.7	2,345	1.09	0.07	0.06	0.04
East-West Road	5.7	4.6	3.4	4,375	1.09	0.27	0.22	0.16

<sup>1</sup> Methodology from Bay Area Air Quality Management District *BAAQMD CEQA Guidelines* (1996).

<sup>2</sup> Emission factors from EMFAC2002 (2003).

## Total Roadway CO Concentrations

$$\text{Peak Hour Emissions} = \text{North-South Concentration} + \text{East-West Concentration} + \text{Background 1-hour Concentration}^2$$

$$\text{8-Hour Emissions} = ((\text{Highest Peak Hour Concentration} - \text{Background 1-hour Concentration}) \times \text{Persistence Factor}) + \text{Background 8-hour Concentration}$$

	A.M. Peak Hour	P.M. Peak Hour	8-Hour
25 Feet from Roadway Edge	3.3	3.3	1.8
50 Feet from Roadway Edge	3.3	3.3	1.7
100 Feet from Roadway Edge	3.2	3.2	1.7

<sup>2</sup> Methodology from Bay Area Air Quality Management District *BAAQMD CEQA Guidelines* (1996).