
**Appendix I Greenhouse Gas Emissions
Worksheets**

Detail Report for Summer Area Source Unmitigated Emissions (Pounds/Day)

File Name: R:\General Air Quality Info\Projects\0D2136700 - Santa Ana Renaissance SP EIR\Modeling\Urbemis\Santa Ana Renaissance Specific Plane EIR - Net Growth.urb924

Project Name: Santa Ana Renaissance Specific Plan EIR

Project Location: South Coast AQMD

On-Road Vehicle Emissions Based on: Version : Emfac2007 V2.3 Nov 1 2006

Off-Road Vehicle Emissions Based on: OFFROAD2007

AREA SOURCE EMISSION ESTIMATES (Summer Pounds Per Day, Unmitigated)

<u>Source</u>	<u>CO2</u>
Natural Gas	58,264.85
Hearth - No Summer Emissions	
Landscape	34.88
Consumer Products	
Architectural Coatings	
TOTALS (lbs/day, unmitigated)	58,299.73

Area Source Changes to Defaults

- Percentage of residences with wood stoves changed from 10% to 0%
- Percentage of residences with wood fireplaces changed from 5% to 0%
- Percentage of residences with natural gas fireplaces changed from 85% to 75%

Detail Report for Winter Area Source Unmitigated Emissions (Pounds/Day)

File Name: R:\General Air Quality Info\Projects\0D2136700 - Santa Ana Renaissance SP EIR\Modeling\Urbemis\Santa Ana Renaissance Specific Plane EIR - Net Growth.urb924

Project Name: Santa Ana Renaissance Specific Plan EIR

Project Location: South Coast AQMD

On-Road Vehicle Emissions Based on: Version : Emfac2007 V2.3 Nov 1 2006

Off-Road Vehicle Emissions Based on: OFFROAD2007

AREA SOURCE EMISSION ESTIMATES (Winter Pounds Per Day, Unmitigated)

<u>Source</u>	<u>CO2</u>
Natural Gas	58,264.85
Hearth	22,460.29
Landscaping - No Winter Emissions	
Consumer Products	
Architectural Coatings	
TOTALS (lbs/day, unmitigated)	80,725.14

Area Source Changes to Defaults

- Percentage of residences with wood stoves changed from 10% to 0%
- Percentage of residences with wood fireplaces changed from 5% to 0%
- Percentage of residences with natural gas fireplaces changed from 85% to 75%

Detail Report for Annual Area Source Unmitigated Emissions (Tons/Year)

File Name: R:\General Air Quality Info\Projects\0D2136700 - Santa Ana Renaissance SP EIR\Modeling\Urbemis\Santa Ana Renaissance Specific Plane EIR - Net Growth.urb924

Project Name: Santa Ana Renaissance Specific Plan EIR

Project Location: South Coast AQMD

On-Road Vehicle Emissions Based on: Version : Emfac2007 V2.3 Nov 1 2006

Off-Road Vehicle Emissions Based on: OFFROAD2007

AREA SOURCE EMISSION ESTIMATES (Annual Tons Per Year, Unmitigated)

<u>Source</u>	<u>CO2</u>
Natural Gas	10,633.33
Hearth	11.23
Landscape	6.36
Consumer Products	
Architectural Coatings	
TOTALS (tons/year, unmitigated)	10,650.92

Area Source Changes to Defaults

Percentage of residences with wood stoves changed from 10% to 0%

Percentage of residences with wood fireplaces changed from 5% to 0%

Percentage of residences with natural gas fireplaces changed from 85% to 75%

Detail Report for Summer Operational Mitigated Emissions (Pounds/Day)

File Name: R:\General Air Quality Info\Projects\0D2136700 - Santa Ana Renaissance SP EIR\Modeling\Urbemis\Santa Ana Renaissance Specific Plane EIR - Net Growth.urb924

Project Name: Santa Ana Renaissance Specific Plan EIR

Project Location: South Coast AQMD

On-Road Vehicle Emissions Based on: Version : Emfac2007 V2.3 Nov 1 2006

Off-Road Vehicle Emissions Based on: OFFROAD2007

OPERATIONAL EMISSION ESTIMATES (Summer Pounds Per Day, Mitigated)

<u>Source</u>	<u>CO2</u>
Single family housing	34,285.29
Condo/townhouse general	246,312.52
Condo/townhouse high rise	18,056.20
City park	10,308.19
Strip mall	156,457.77
TOTALS (lbs/day, mitigated)	465,419.97

Does not include correction for passby trips

Does not include double counting adjustment for internal trips

Analysis Year: 2035 Temperature (F): 80 Season: Summer

Emfac: Version : Emfac2007 V2.3 Nov 1 2006

Operational Mitigation Options SelectedResidential Mitigation Measures

Residential Local-Serving Retail Mitigation

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Operational Mitigation Options SelectedResidential Mitigation Measures

Percent Reduction in Trips is 0% (calculated as a % of 9.57 trips/day))

Note that the above percent is applied to a baseline of 9.57 and that product is subtracted from the Unmitigated Trips

Inputs Selected:

The Presence of Local-Serving Retail checkbox was NOT selected.

Nonresidential Mitigation Measures

Non-Residential Local-Serving Retail Mitigation

Percent Reduction in Trips is 0%

Inputs Selected:

The Presence of Local-Serving Retail checkbox was NOT selected.

Summary of Land Uses

Land Use Type	Acreage	Trip Rate	Unit Type	No. Units	Total Trips	Total VMT
Single family housing	111.67	9.57	dwelling units	335.00	3,205.95	32,389.07
Condo/townhouse general	208.62	6.90	dwelling units	3,338.00	23,032.20	232,689.71
Condo/townhouse high rise	6.28	4.20	dwelling units	402.00	1,688.40	17,057.57
City park		1.59	acres	680.00	1,081.20	9,820.00

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Summary of Land Uses

Land Use Type	Acreage	Trip Rate	Unit Type	No. Units	Total Trips	Total VMT
Strip mall		42.94	1000 sq ft	387.00	16,617.78	149,111.33
					45,625.53	441,067.68

Vehicle Fleet Mix

Vehicle Type	Percent Type	Non-Catalyst	Catalyst	Diesel
Light Auto	48.0	0.0	100.0	0.0
Light Truck < 3750 lbs	7.4	0.0	100.0	0.0
Light Truck 3751-5750 lbs	24.4	0.0	100.0	0.0
Med Truck 5751-8500 lbs	11.8	0.0	100.0	0.0
Lite-Heavy Truck 8501-10,000 lbs	1.9	0.0	78.9	21.1
Lite-Heavy Truck 10,001-14,000 lbs	0.6	0.0	66.7	33.3
Med-Heavy Truck 14,001-33,000 lbs	1.0	0.0	20.0	80.0
Heavy-Heavy Truck 33,001-60,000 lbs	0.7	0.0	0.0	100.0
Other Bus	0.1	0.0	0.0	100.0
Urban Bus	0.1	0.0	0.0	100.0
Motorcycle	2.5	32.0	68.0	0.0
School Bus	0.1	0.0	0.0	100.0
Motor Home	1.4	0.0	92.9	7.1

Travel Conditions

	Residential			Commercial		
	Home-Work	Home-Shop	Home-Other	Commute	Non-Work	Customer
Urban Trip Length (miles)	12.7	7.0	9.5	13.3	7.4	8.9
Rural Trip Length (miles)	17.6	12.1	14.9	15.4	9.6	12.6

	<u>Travel Conditions</u>					
	Residential			Commercial		
	Home-Work	Home-Shop	Home-Other	Commute	Non-Work	Customer
Trip speeds (mph)	30.0	30.0	30.0	30.0	30.0	30.0
% of Trips - Residential	32.9	18.0	49.1			
% of Trips - Commercial (by land use)						
City park				5.0	2.5	92.5
Strip mall				2.0	1.0	97.0

Operational Changes to Defaults

Urbemis 2007 Version 9.2.4

Detail Report for Winter Operational Mitigated Emissions (Pounds/Day)

File Name: R:\General Air Quality Info\Projects\0D2136700 - Santa Ana Renaissance SP EIR\Modeling\Urbemis\Santa Ana Renaissance Specific Plane EIR - Net Growth.urb924

Project Name: Santa Ana Renaissance Specific Plan EIR

Project Location: South Coast AQMD

On-Road Vehicle Emissions Based on: Version : Emfac2007 V2.3 Nov 1 2006

Off-Road Vehicle Emissions Based on: OFFROAD2007

OPERATIONAL EMISSION ESTIMATES (Summer Pounds Per Day, Mitigated)

<u>Source</u>	CO2
Single family housing	31,032.01
Condo/townhouse general	222,940.31
Condo/townhouse high rise	16,342.88
City park	9,321.83
Strip mall	141,480.47
TOTALS (lbs/day, mitigated)	421,117.50

Does not include correction for passby trips

Does not include double counting adjustment for internal trips

Analysis Year: 2035 Temperature (F): 60 Season: Winter

Emfac: Version : Emfac2007 V2.3 Nov 1 2006

Operational Mitigation Options Selected

Residential Mitigation Measures

Residential Local-Serving Retail Mitigation

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Operational Mitigation Options SelectedResidential Mitigation Measures

Percent Reduction in Trips is 0% (calculated as a % of 9.57 trips/day))

Note that the above percent is applied to a baseline of 9.57 and that product is subtracted from the Unmitigated Trips

Inputs Selected:

The Presence of Local-Serving Retail checkbox was NOT selected.

Nonresidential Mitigation Measures

Non-Residential Local-Serving Retail Mitigation

Percent Reduction in Trips is 0%

Inputs Selected:

The Presence of Local-Serving Retail checkbox was NOT selected.

Summary of Land Uses

Land Use Type	Acreage	Trip Rate	Unit Type	No. Units	Total Trips	Total VMT
Single family housing	111.67	9.57	dwelling units	335.00	3,205.95	32,389.07
Condo/townhouse general	208.62	6.90	dwelling units	3,338.00	23,032.20	232,689.71
Condo/townhouse high rise	6.28	4.20	dwelling units	402.00	1,688.40	17,057.57
City park		1.59	acres	680.00	1,081.20	9,820.00

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Summary of Land Uses

Land Use Type	Acreage	Trip Rate	Unit Type	No. Units	Total Trips	Total VMT
Strip mall		42.94	1000 sq ft	387.00	16,617.78	149,111.33
					45,625.53	441,067.68

Vehicle Fleet Mix

Vehicle Type	Percent Type	Non-Catalyst	Catalyst	Diesel
Light Auto	48.0	0.0	100.0	0.0
Light Truck < 3750 lbs	7.4	0.0	100.0	0.0
Light Truck 3751-5750 lbs	24.4	0.0	100.0	0.0
Med Truck 5751-8500 lbs	11.8	0.0	100.0	0.0
Lite-Heavy Truck 8501-10,000 lbs	1.9	0.0	78.9	21.1
Lite-Heavy Truck 10,001-14,000 lbs	0.6	0.0	66.7	33.3
Med-Heavy Truck 14,001-33,000 lbs	1.0	0.0	20.0	80.0
Heavy-Heavy Truck 33,001-60,000 lbs	0.7	0.0	0.0	100.0
Other Bus	0.1	0.0	0.0	100.0
Urban Bus	0.1	0.0	0.0	100.0
Motorcycle	2.5	32.0	68.0	0.0
School Bus	0.1	0.0	0.0	100.0
Motor Home	1.4	0.0	92.9	7.1

Travel Conditions

	Residential			Commercial		
	Home-Work	Home-Shop	Home-Other	Commute	Non-Work	Customer
Urban Trip Length (miles)	12.7	7.0	9.5	13.3	7.4	8.9
Rural Trip Length (miles)	17.6	12.1	14.9	15.4	9.6	12.6

	<u>Travel Conditions</u>					
	Residential			Commercial		
	Home-Work	Home-Shop	Home-Other	Commute	Non-Work	Customer
Trip speeds (mph)	30.0	30.0	30.0	30.0	30.0	30.0
% of Trips - Residential	32.9	18.0	49.1			
% of Trips - Commercial (by land use)						
City park				5.0	2.5	92.5
Strip mall				2.0	1.0	97.0

Operational Changes to Defaults

Urbemis 2007 Version 9.2.4

Detail Report for Annual Operational Mitigated Emissions (Tons/Year)

File Name: R:\General Air Quality Info\Projects\0D2136700 - Santa Ana Renaissance SP EIR\Modeling\Urbemis\Santa Ana Renaissance Specific Plane EIR - Net Growth.urb924

Project Name: Santa Ana Renaissance Specific Plan EIR

Project Location: South Coast AQMD

On-Road Vehicle Emissions Based on: Version : Emfac2007 V2.3 Nov 1 2006

Off-Road Vehicle Emissions Based on: OFFROAD2007

OPERATIONAL EMISSION ESTIMATES (Annual Tons Per Year, Mitigated)

<u>Source</u>	CO2
Single family housing	6,059.16
Condo/townhouse general	43,530.23
Condo/townhouse high rise	3,191.03
City park	1,821.24
Strip mall	27,642.42
TOTALS (tons/year, mitigated)	82,244.08

Does not include correction for passby trips

Does not include double counting adjustment for internal trips

Analysis Year: 2035 Season: Annual

Emfac: Version : Emfac2007 V2.3 Nov 1 2006

Operational Mitigation Options Selected

Residential Mitigation Measures

Residential Local-Serving Retail Mitigation

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Operational Mitigation Options SelectedResidential Mitigation Measures

Percent Reduction in Trips is 0% (calculated as a % of 9.57 trips/day))

Note that the above percent is applied to a baseline of 9.57 and that product is subtracted from the Unmitigated Trips

Inputs Selected:

The Presence of Local-Serving Retail checkbox was NOT selected.

Nonresidential Mitigation MeasuresNon-Residential Local-Serving Retail Mitigation

Percent Reduction in Trips is 0%

Inputs Selected:

The Presence of Local-Serving Retail checkbox was NOT selected.

Summary of Land Uses

Land Use Type	Acreage	Trip Rate	Unit Type	No. Units	Total Trips	Total VMT
Single family housing	111.67	9.57	dwelling units	335.00	3,205.95	32,389.07
Condo/townhouse general	208.62	6.90	dwelling units	3,338.00	23,032.20	232,689.71
Condo/townhouse high rise	6.28	4.20	dwelling units	402.00	1,688.40	17,057.57
City park		1.59	acres	680.00	1,081.20	9,820.00

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Summary of Land Uses

Land Use Type	Acreage	Trip Rate	Unit Type	No. Units	Total Trips	Total VMT
Strip mall		42.94	1000 sq ft	387.00	16,617.78	149,111.33
					45,625.53	441,067.68

Vehicle Fleet Mix

Vehicle Type	Percent Type	Non-Catalyst	Catalyst	Diesel
Light Auto	48.0	0.0	100.0	0.0
Light Truck < 3750 lbs	7.4	0.0	100.0	0.0
Light Truck 3751-5750 lbs	24.4	0.0	100.0	0.0
Med Truck 5751-8500 lbs	11.8	0.0	100.0	0.0
Lite-Heavy Truck 8501-10,000 lbs	1.9	0.0	78.9	21.1
Lite-Heavy Truck 10,001-14,000 lbs	0.6	0.0	66.7	33.3
Med-Heavy Truck 14,001-33,000 lbs	1.0	0.0	20.0	80.0
Heavy-Heavy Truck 33,001-60,000 lbs	0.7	0.0	0.0	100.0
Other Bus	0.1	0.0	0.0	100.0
Urban Bus	0.1	0.0	0.0	100.0
Motorcycle	2.5	32.0	68.0	0.0
School Bus	0.1	0.0	0.0	100.0
Motor Home	1.4	0.0	92.9	7.1

Travel Conditions

	Residential			Commercial		
	Home-Work	Home-Shop	Home-Other	Commute	Non-Work	Customer
Urban Trip Length (miles)	12.7	7.0	9.5	13.3	7.4	8.9
Rural Trip Length (miles)	17.6	12.1	14.9	15.4	9.6	12.6

	<u>Travel Conditions</u>					
	Residential			Commercial		
	Home-Work	Home-Shop	Home-Other	Commute	Non-Work	Customer
Trip speeds (mph)	30.0	30.0	30.0	30.0	30.0	30.0
% of Trips - Residential	32.9	18.0	49.1			
% of Trips - Commercial (by land use)						
City park				5.0	2.5	92.5
Strip mall				2.0	1.0	97.0

Operational Changes to Defaults

Urbemis 2007 Version 9.2.4

Detail Report for Summer Area Source Mitigated Emissions (Pounds/Day)

File Name: C:\Documents and Settings\23856\Desktop\Santa Ana Potential Net Development\Santa Ana Potential net Development Mitigated.urb924

Project Name: Net Potential Growth Mitigated

Project Location: South Coast AQMD

On-Road Vehicle Emissions Based on: Version : Emfac2007 V2.3 Nov 1 2006

Off-Road Vehicle Emissions Based on: OFFROAD2007

AREA SOURCE EMISSION ESTIMATES (Summer Pounds Per Day, Mitigated)

<u>Source</u>	<u>CO2</u>
Natural Gas	46,611.88
Hearth - No Summer Emissions	
Landscape	27.90
Consumer Products	
Architectural Coatings	
TOTALS (lbs/day, mitigated)	46,639.78

Area Source Mitigation Measures Selected

<u>Mitigation Description</u>	<u>Percent Reduction</u>
Residential Increase Energy Efficiency Beyond Title 24	20.00
Commercial Increase Energy Efficiency Beyond Title 24	20.00
Industrial Increase Energy Efficiency Beyond Title 24	20.00
Percent of Residential Landscape Equipment that are Electrically Powered and have Electrical Outlets at the the Front and Rear of Residences	20.00

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Percent of Commercial and Industrial Landscape Equipment that are Electrically Powered and have Electrical Outlets Available	20.00
For Residential Interior Use Low VOC Coating	10.00
For Residential Exterior Use Low VOC Coating	10.00
For Nonresidential Interior Use Low VOC Coating	10.00
For Nonresidential Exterior Use Low VOC Coating	10.00

Area Source Changes to Defaults

Percentage of residences with wood stoves changed from 10% to 0%
Percentage of residences with wood fireplaces changed from 5% to 0%
Percentage of residences with natural gas fireplaces changed from 85% to 75%

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Urbemis 2007 Version 9.2.4

Detail Report for Winter Area Source Mitigated Emissions (Pounds/Day)

File Name: C:\Documents and Settings\23856\Desktop\Santa Ana Potential Net Development\Santa Ana Potential net Development Mitigated.urb924

Project Name: Net Potential Growth Mitigated

Project Location: South Coast AQMD

On-Road Vehicle Emissions Based on: Version : Emfac2007 V2.3 Nov 1 2006

Off-Road Vehicle Emissions Based on: OFFROAD2007

AREA SOURCE EMISSION ESTIMATES (Winter Pounds Per Day, Mitigated)

<u>Source</u>	<u>CO2</u>
Natural Gas	46,611.88
Hearth	22,460.29
Landscaping - No Winter Emissions	
Consumer Products	
Architectural Coatings	
TOTALS (lbs/day, Mitigated)	69,072.17

Area Source Mitigation Measures Selected

<u>Mitigation Description</u>	<u>Percent Reduction</u>
Residential Increase Energy Efficiency Beyond Title 24	20.00
Commercial Increase Energy Efficiency Beyond Title 24	20.00
Industrial Increase Energy Efficiency Beyond Title 24	20.00
For Residential Interior Use Low VOC Coating	10.00
For Residential Exterior Use Low VOC Coating	10.00

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For Nonresidential Interior Use Low VOC Coating	10.00
For Nonresidential Exterior Use Low VOC Coating	10.00

Area Source Changes to Defaults

Percentage of residences with wood stoves changed from 10% to 0%
Percentage of residences with wood fireplaces changed from 5% to 0%
Percentage of residences with natural gas fireplaces changed from 85% to 75%

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Urbemis 2007 Version 9.2.4

Detail Report for Annual Area Source Mitigated Emissions (Tons/Year)

File Name: C:\Documents and Settings\23856\Desktop\Santa Ana Potential Net Development\Santa Ana Potential net Development Mitigated.urb924

Project Name: Net Potential Growth Mitigated

Project Location: South Coast AQMD

On-Road Vehicle Emissions Based on: Version : Emfac2007 V2.3 Nov 1 2006

Off-Road Vehicle Emissions Based on: OFFROAD2007

AREA SOURCE EMISSION ESTIMATES (Annual Tons Per Year, Mitigated)

<u>Source</u>	<u>CO2</u>
Natural Gas	8,506.67
Hearth	11.23
Landscape	5.09
Consumer Products	
Architectural Coatings	
TOTALS (tons/year, mitigated)	8,522.99

Area Source Mitigation Measures Selected

<u>Mitigation Description</u>	<u>Percent Reduction</u>
Residential Increase Energy Efficiency Beyond Title 24	20.00
Commercial Increase Energy Efficiency Beyond Title 24	20.00
Industrial Increase Energy Efficiency Beyond Title 24	20.00
Percent of Residential Landscape Equipment that are Electrically Powered and have Electrical Outlets at the the Front and Rear of Residences	20.00

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Percent of Commercial and Industrial Landscape Equipment that are Electrically Powered and have Electrical Outlets Available	20.00
For Residential Interior Use Low VOC Coating	10.00
For Residential Exterior Use Low VOC Coating	10.00
For Nonresidential Interior Use Low VOC Coating	10.00
For Nonresidential Exterior Use Low VOC Coating	10.00

Area Source Changes to Defaults

Percentage of residences with wood stoves changed from 10% to 0%
Percentage of residences with wood fireplaces changed from 5% to 0%
Percentage of residences with natural gas fireplaces changed from 85% to 75%

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Urbemis 2007 Version 9.2.4

Detail Report for Summer Operational Mitigated Emissions (Pounds/Day)

File Name: C:\Documents and Settings\23856\Desktop\Santa Ana Potential Net Development\Santa Ana Potential net Development Mitigated.urb924

Project Name: Net Potential Growth Mitigated

Project Location: South Coast AQMD

On-Road Vehicle Emissions Based on: Version : Emfac2007 V2.3 Nov 1 2006

Off-Road Vehicle Emissions Based on: OFFROAD2007

OPERATIONAL EMISSION ESTIMATES (Summer Pounds Per Day, Mitigated)

<u>Source</u>	<u>CO2</u>
Single family housing	32,742.45
Condo/townhouse general	230,939.41
Condo/townhouse high rise	16,204.80
City park	9,844.32
Strip mall	149,417.17
TOTALS (lbs/day, mitigated)	439,148.15

Does not include correction for passby trips

Does not include double counting adjustment for internal trips

Analysis Year: 2035 Temperature (F): 80 Season: Summer

Emfac: Version : Emfac2007 V2.3 Nov 1 2006

Operational Mitigation Options Selected

Residential Mitigation Measures

Residential Local-Serving Retail Mitigation

Operational Mitigation Options Selected

Residential Mitigation Measures

Percent Reduction in Trips is 0% (calculated as a % of 9.57 trips/day))

Note that the above percent is applied to a baseline of 9.57 and that product is subtracted from the Unmitigated Trips

Inputs Selected:

The Presence of Local-Serving Retail checkbox was NOT selected.

Residential Pedestrian/Bicycle Friendliness Mitigation

Percent Reduction in Trips is 4.5% (calculated as a % of 9.57 trips/day)

Note that the above percent is applied to a baseline of 9.57 and that product is subtracted from the Unmitigated Trips

Inputs Selected:

The Number of Intersections per Square Mile is 0

The Percent of Streets with Sidewalks on One Side is 100%

The Percent of Streets with Sidewalks on Both Sides is 100%

The Percent of Arterials/Collectors with Bike Lanes or where Suitable,

Direct Parallel Routes Exist is 0%

Nonresidential Mitigation Measures

Non-Residential Local-Serving Retail Mitigation

Nonresidential Mitigation Measures

Percent Reduction in Trips is 0%

Inputs Selected:

The Presence of Local-Serving Retail checkbox was NOT selected.

Non-Residential Pedestrian/Bicycle Friendliness Mitigation

Percent Reduction in Trips is 4.5%

Inputs Selected:

The Number of Intersections per Square Mile is 0

The Percent of Streets with Sidewalks on One Side is 100%

The Percent of Streets with Sidewalks on Both Sides is 100%

The Percent of Arterials/Collectors with Bike Lanes or where Suitable,

Direct Parallel Routes Exist is 0%

Non-Residential Other Transportation Demand Measures Mitigation

Percent Reduction in Trips is 0%

Note that the above percent is applied ONLY to worker trips.

Inputs Selected:

The 'Secure Bike Parking' measure was selected

The 'Preferential Carpool/Vanpool Parking' measure was selected

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Summary of Land Uses

Land Use Type	Acreage	Trip Rate	Unit Type	No. Units	Total Trips	Total VMT
Single family housing	111.67	9.14	dwelling units	335.00	3,061.68	30,931.56
Condo/townhouse general	208.62	6.47	dwelling units	3,338.00	21,594.69	218,166.84
Condo/townhouse high rise	6.28	3.77	dwelling units	402.00	1,515.28	15,308.56
City park		1.52	acres	680.00	1,032.55	9,378.10
Strip mall		41.01	1000 sq ft	387.00	15,869.98	142,401.32
					43,074.18	416,186.38

Vehicle Fleet Mix

Vehicle Type	Percent Type	Non-Catalyst	Catalyst	Diesel
Light Auto	48.0	0.0	100.0	0.0
Light Truck < 3750 lbs	7.4	0.0	100.0	0.0
Light Truck 3751-5750 lbs	24.4	0.0	100.0	0.0
Med Truck 5751-8500 lbs	11.8	0.0	100.0	0.0
Lite-Heavy Truck 8501-10,000 lbs	1.9	0.0	78.9	21.1
Lite-Heavy Truck 10,001-14,000 lbs	0.6	0.0	66.7	33.3
Med-Heavy Truck 14,001-33,000 lbs	1.0	0.0	20.0	80.0
Heavy-Heavy Truck 33,001-60,000 lbs	0.7	0.0	0.0	100.0
Other Bus	0.1	0.0	0.0	100.0
Urban Bus	0.1	0.0	0.0	100.0
Motorcycle	2.5	32.0	68.0	0.0
School Bus	0.1	0.0	0.0	100.0

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Vehicle Fleet Mix

Vehicle Type	Percent Type	Non-Catalyst	Catalyst	Diesel
Motor Home	1.4	0.0	92.9	7.1

Travel Conditions

	Residential			Commercial		
	Home-Work	Home-Shop	Home-Other	Commute	Non-Work	Customer
Urban Trip Length (miles)	12.7	7.0	9.5	13.3	7.4	8.9
Rural Trip Length (miles)	17.6	12.1	14.9	15.4	9.6	12.6
Trip speeds (mph)	30.0	30.0	30.0	30.0	30.0	30.0
% of Trips - Residential	32.9	18.0	49.1			
% of Trips - Commercial (by land use)						
City park				5.0	2.5	92.5
Strip mall				2.0	1.0	97.0

Operational Changes to Defaults

Detail Report for Winter Operational Mitigated Emissions (Pounds/Day)

File Name: C:\Documents and Settings\23856\Desktop\Santa Ana Potential Net Development\Santa Ana Potential net Development Mitigated.urb924

Project Name: Net Potential Growth Mitigated

Project Location: South Coast AQMD

On-Road Vehicle Emissions Based on: Version : Emfac2007 V2.3 Nov 1 2006

Off-Road Vehicle Emissions Based on: OFFROAD2007

OPERATIONAL EMISSION ESTIMATES (Summer Pounds Per Day, Mitigated)

Source	CO2
Single family housing	29,635.57
Condo/townhouse general	209,025.92
Condo/townhouse high rise	14,667.15
City park	8,902.35
Strip mall	135,113.85
TOTALS (lbs/day, mitigated)	397,344.84

Does not include correction for passby trips

Does not include double counting adjustment for internal trips

Analysis Year: 2035 Temperature (F): 60 Season: Winter

Emfac: Version : Emfac2007 V2.3 Nov 1 2006

Operational Mitigation Options Selected

Residential Mitigation Measures

Residential Local-Serving Retail Mitigation

Operational Mitigation Options Selected

Residential Mitigation Measures

Percent Reduction in Trips is 0% (calculated as a % of 9.57 trips/day))

Note that the above percent is applied to a baseline of 9.57 and that product is subtracted from the Unmitigated Trips

Inputs Selected:

The Presence of Local-Serving Retail checkbox was NOT selected.

Residential Pedestrian/Bicycle Friendliness Mitigation

Percent Reduction in Trips is 4.5% (calculated as a % of 9.57 trips/day)

Note that the above percent is applied to a baseline of 9.57 and that product is subtracted from the Unmitigated Trips

Inputs Selected:

The Number of Intersections per Square Mile is 0

The Percent of Streets with Sidewalks on One Side is 100%

The Percent of Streets with Sidewalks on Both Sides is 100%

The Percent of Arterials/Collectors with Bike Lanes or where Suitable,

Direct Parallel Routes Exist is 0%

Nonresidential Mitigation Measures

Non-Residential Local-Serving Retail Mitigation

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Nonresidential Mitigation Measures

Percent Reduction in Trips is 0%

Inputs Selected:

The Presence of Local-Serving Retail checkbox was NOT selected.

Non-Residential Pedestrian/Bicycle Friendliness Mitigation

Percent Reduction in Trips is 4.5%

Inputs Selected:

The Number of Intersections per Square Mile is 0

The Percent of Streets with Sidewalks on One Side is 100%

The Percent of Streets with Sidewalks on Both Sides is 100%

The Percent of Arterials/Collectors with Bike Lanes or where Suitable,

Direct Parallel Routes Exist is 0%

Non-Residential Other Transportation Demand Measures Mitigation

Percent Reduction in Trips is 0%

Note that the above percent is applied ONLY to worker trips.

Inputs Selected:

The 'Secure Bike Parking' measure was selected

The 'Preferential Carpool/Vanpool Parking' measure was selected

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Summary of Land Uses

Land Use Type	Acreage	Trip Rate	Unit Type	No. Units	Total Trips	Total VMT
Single family housing	111.67	9.14	dwelling units	335.00	3,061.68	30,931.56
Condo/townhouse general	208.62	6.47	dwelling units	3,338.00	21,594.69	218,166.84
Condo/townhouse high rise	6.28	3.77	dwelling units	402.00	1,515.28	15,308.56
City park		1.52	acres	680.00	1,032.55	9,378.10
Strip mall		41.01	1000 sq ft	387.00	15,869.98	142,401.32
					43,074.18	416,186.38

Vehicle Fleet Mix

Vehicle Type	Percent Type	Non-Catalyst	Catalyst	Diesel
Light Auto	48.0	0.0	100.0	0.0
Light Truck < 3750 lbs	7.4	0.0	100.0	0.0
Light Truck 3751-5750 lbs	24.4	0.0	100.0	0.0
Med Truck 5751-8500 lbs	11.8	0.0	100.0	0.0
Lite-Heavy Truck 8501-10,000 lbs	1.9	0.0	78.9	21.1
Lite-Heavy Truck 10,001-14,000 lbs	0.6	0.0	66.7	33.3
Med-Heavy Truck 14,001-33,000 lbs	1.0	0.0	20.0	80.0
Heavy-Heavy Truck 33,001-60,000 lbs	0.7	0.0	0.0	100.0
Other Bus	0.1	0.0	0.0	100.0
Urban Bus	0.1	0.0	0.0	100.0
Motorcycle	2.5	32.0	68.0	0.0
School Bus	0.1	0.0	0.0	100.0

<u>Vehicle Fleet Mix</u>						
Vehicle Type	Percent Type		Non-Catalyst	Catalyst	Diesel	
Motor Home	1.4		0.0	92.9	7.1	
<u>Travel Conditions</u>						
	Residential			Commercial		
	Home-Work	Home-Shop	Home-Other	Commute	Non-Work	Customer
Urban Trip Length (miles)	12.7	7.0	9.5	13.3	7.4	8.9
Rural Trip Length (miles)	17.6	12.1	14.9	15.4	9.6	12.6
Trip speeds (mph)	30.0	30.0	30.0	30.0	30.0	30.0
% of Trips - Residential	32.9	18.0	49.1			
% of Trips - Commercial (by land use)						
City park				5.0	2.5	92.5
Strip mall				2.0	1.0	97.0
<u>Operational Changes to Defaults</u>						

Urbemis 2007 Version 9.2.4

Detail Report for Annual Operational Mitigated Emissions (Tons/Year)

File Name: C:\Documents and Settings\23856\Desktop\Santa Ana Potential Net Development\Santa Ana Potential net Development Mitigated.urb924

Project Name: Net Potential Growth Mitigated

Project Location: South Coast AQMD

On-Road Vehicle Emissions Based on: Version : Emfac2007 V2.3 Nov 1 2006

Off-Road Vehicle Emissions Based on: OFFROAD2007

OPERATIONAL EMISSION ESTIMATES (Annual Tons Per Year, Mitigated)

<u>Source</u>	CO2
Single family housing	5,786.50
Condo/townhouse general	40,813.37
Condo/townhouse high rise	2,863.83
City park	1,739.28
Strip mall	26,398.51
TOTALS (tons/year, mitigated)	77,601.49

Does not include correction for passby trips

Does not include double counting adjustment for internal trips

Analysis Year: 2035 Season: Annual

Emfac: Version : Emfac2007 V2.3 Nov 1 2006

Operational Mitigation Options Selected

Residential Mitigation Measures

Residential Local-Serving Retail Mitigation

Operational Mitigation Options Selected

Residential Mitigation Measures

Percent Reduction in Trips is 0% (calculated as a % of 9.57 trips/day))

Note that the above percent is applied to a baseline of 9.57 and that product is subtracted from the Unmitigated Trips

Inputs Selected:

The Presence of Local-Serving Retail checkbox was NOT selected.

Residential Pedestrian/Bicycle Friendliness Mitigation

Percent Reduction in Trips is 4.5% (calculated as a % of 9.57 trips/day)

Note that the above percent is applied to a baseline of 9.57 and that product is subtracted from the Unmitigated Trips

Inputs Selected:

The Number of Intersections per Square Mile is 0

The Percent of Streets with Sidewalks on One Side is 100%

The Percent of Streets with Sidewalks on Both Sides is 100%

The Percent of Arterials/Collectors with Bike Lanes or where Suitable,

Direct Parallel Routes Exist is 0%

Nonresidential Mitigation Measures

Non-Residential Local-Serving Retail Mitigation

Nonresidential Mitigation Measures

Percent Reduction in Trips is 0%

Inputs Selected:

The Presence of Local-Serving Retail checkbox was NOT selected.

Non-Residential Pedestrian/Bicycle Friendliness Mitigation

Percent Reduction in Trips is 4.5%

Inputs Selected:

The Number of Intersections per Square Mile is 0

The Percent of Streets with Sidewalks on One Side is 100%

The Percent of Streets with Sidewalks on Both Sides is 100%

The Percent of Arterials/Collectors with Bike Lanes or where Suitable,

Direct Parallel Routes Exist is 0%

Non-Residential Other Transportation Demand Measures Mitigation

Percent Reduction in Trips is 0%

Note that the above percent is applied ONLY to worker trips.

Inputs Selected:

The 'Secure Bike Parking' measure was selected

The 'Preferential Carpool/Vanpool Parking' measure was selected

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Summary of Land Uses

Land Use Type	Acreage	Trip Rate	Unit Type	No. Units	Total Trips	Total VMT
Single family housing	111.67	9.14	dwelling units	335.00	3,061.68	30,931.56
Condo/townhouse general	208.62	6.47	dwelling units	3,338.00	21,594.69	218,166.84
Condo/townhouse high rise	6.28	3.77	dwelling units	402.00	1,515.28	15,308.56
City park		1.52	acres	680.00	1,032.55	9,378.10
Strip mall		41.01	1000 sq ft	387.00	15,869.98	142,401.32
					43,074.18	416,186.38

Vehicle Fleet Mix

Vehicle Type	Percent Type	Non-Catalyst	Catalyst	Diesel
Light Auto	48.0	0.0	100.0	0.0
Light Truck < 3750 lbs	7.4	0.0	100.0	0.0
Light Truck 3751-5750 lbs	24.4	0.0	100.0	0.0
Med Truck 5751-8500 lbs	11.8	0.0	100.0	0.0
Lite-Heavy Truck 8501-10,000 lbs	1.9	0.0	78.9	21.1
Lite-Heavy Truck 10,001-14,000 lbs	0.6	0.0	66.7	33.3
Med-Heavy Truck 14,001-33,000 lbs	1.0	0.0	20.0	80.0
Heavy-Heavy Truck 33,001-60,000 lbs	0.7	0.0	0.0	100.0
Other Bus	0.1	0.0	0.0	100.0
Urban Bus	0.1	0.0	0.0	100.0
Motorcycle	2.5	32.0	68.0	0.0
School Bus	0.1	0.0	0.0	100.0

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Vehicle Fleet Mix

Vehicle Type	Percent Type	Non-Catalyst	Catalyst	Diesel
Motor Home	1.4	0.0	92.9	7.1

Travel Conditions

	Residential			Commercial		
	Home-Work	Home-Shop	Home-Other	Commute	Non-Work	Customer
Urban Trip Length (miles)	12.7	7.0	9.5	13.3	7.4	8.9
Rural Trip Length (miles)	17.6	12.1	14.9	15.4	9.6	12.6
Trip speeds (mph)	30.0	30.0	30.0	30.0	30.0	30.0
% of Trips - Residential	32.9	18.0	49.1			
% of Trips - Commercial (by land use)						
City park				5.0	2.5	92.5
Strip mall				2.0	1.0	97.0

Operational Changes to Defaults

Renaissance Potential Net Development
Input data for Green House Gas Emissions
Unmitigated
Carbon Dioxide

A. Direct Sources

A1. Mobile (Construction Equipment, Motor Vehicles, and Landscape Equipment) and Stationary Sources (Cooling and Heating)

Emissions of carbon dioxide from mobile (construction equipment, motor vehicles, and landscape equipment) and stationary sources (cooling and heating) are calculated using the following equation:

$$Y_a = (Y_1)+(Y_2)+(Y_3)+(Y_4)$$

Y_a = annual emissions of carbon dioxide from mobile and stationary sources, tons/yr.
Y₁ = annual emissions of carbon dioxide from construction equipment, tons/yr (URBEMIS 2007 9.2.2 output file).
Y₂ = annual emissions of carbon dioxide from motor vehicles, tons/yr (URBEMIS 2007 9.2.2 output file).
Y₃ = annual emissions of carbon dioxide from landscape equipment, tons/yr (URBEMIS 2007 9.2.2 output file).
Y₄ = annual emissions of carbon dioxide from cooling and heating, tons/yr (URBEMIS 2007 9.2.2 output file).

Y ₁ tons/yr	Y ₂ tons/yr	Y ₃ tons/yr	Y ₄ tons/yr	Y _a tons/yr
677.45	82,244.08	6.36	10,633.33	93,561.22
0.01	0.88	0.00	0.11	

B. Indirect Sources

B1. Electricity

Emissions of carbon dioxide from electricity usage are calculated using the following equation:

$$Y_a = (U_e)(E)(C)^1$$

Y_a = annual emissions of carbon dioxide from electricity usage, tons/yr.
U_e = annual electricity usage, MWh/yr.
E = emission factor for electricity usage, 804.54 lbs/MWh (California Climate Action Registry General Reporting Protocol, Version 2.2, Part III, Chapter 6, 2007).
C = conversion factor from lbs to tons, 2,000 lbs/ton.

Unit Type	R _a *	A **	Unit	U _e MWh/yr	E, lbs/MWh	C, lbs/ton	Y _a tons/yr
SF Residential	5.6265	335	household	1,884.86	724.12	2,000	682.44
MF Residential	5.6265	3,740	household	21,063.11	724.12	2,000	7,516.97
Food Store	0.04099	0	sq ft	0.00	724.12	2,000	0.00
Restaurant	0.0402	0	sq ft	0.00	724.12	2,000	0.00
Hospitals	0.01561	0	sq ft	0.00	724.12	2,000	0.00
Retail	0.01406	387,000	sq ft	5,441.22	724.12	2,000	1,670.05
College/University	0.01236	0	sq ft	0.00	724.12	2,000	0.00
High school	0.00746	0	sq ft	0.00	724.12	2,000	0.00
Elementary School	0.00746	0	sq ft	0.00	724.12	2,000	0.00
Office	0.0131	0.00	sq ft	0.00	724.12	2,000	0.00
Hotel/Motel	0.01213	0.00	sq ft	0.00	724.12	2,000	0.00
Warehouse	0.02002	0.00	sq ft	0.00	724.12	2,000	0.00
Miscellaneous	0.00001	680,000.00	sq ft	6.80	724.12	2,000	2.46
Commercial	0.01363	0.00	sq ft	0.00	724.12	2,000	0.00
Total, tons/yr							10,273.82

* R_a = annual consumption rate (CEQA Handbook, Table A9-11-A). Table A9-11A gives the rate in KWH. we need MWh therefore need to divide by 1000
** A = unit type number.

B2. Potable Water

Emissions of carbon dioxide from potable water treatment and transportation for domestic use are calculated using the following equation:

$$Y_a = (U_w)(E)(C)^1$$

Y_a = annual emissions of carbon dioxide from electricity used for potable water treatment and transportation, tons/yr.
U_w = annual electricity usage for potable water treatment and transportation, MWh/yr.
E = emission factor for electricity usage, 804.54 lbs/MWh (California Climate Action Registry General Reporting Protocol, Version 2.2, Part III, Chapter 6, 2007).
C = conversion factor from lbs to tons, 2,000 lbs/ton.

Unit Type	unit type	unit number	V, MG/yr	MWh/MG	U _w MWh/yr	E, lbs/MWh	C, lbs/ton	Y _a tons/yr
SF Residential	household	335.00	85.59	0.01020	0.87	724.12	2,000	0.32
MF Residential	household	3740.00	955.57	0.01020	9.75	724.12	2,000	3.53
Food Store	sq ft	0.00	0.00	0.01020	0.00	724.12	2,000	0.00
Restaurant	sq ft	0.00	0.00	0.01020	0.00	724.12	2,000	0.00
Hospitals	sq ft	0.00	0.00	0.01020	0.00	724.12	2,000	0.00
Retail	sq ft	125000.00	31.07	0.01020	0.32	724.12	2,000	0.11
Commercial	sq ft	0.00	0.00	0.01020	0.00	724.12	2,000	0.00
College/University	sq ft	0.00	0.00	0.01020	0.00	724.12	2,000	0.00
High school	sq ft	0.00	0.00	0.01020	0.00	724.12	2,000	0.00
Elementary School	sq ft	0.00	0.00	0.01020	0.00	724.12	2,000	0.00
Office	sq ft	0.00	0.00	0.01020	0.00	724.12	2,000	0.00
Hotel/Motel	sq ft	0.00	0.00	0.01020	0.00	724.12	2,000	0.00
Warehouse	sq ft	0.00	0.00	0.01020	0.00	724.12	2,000	0.00
Miscellaneous	sq ft	680000.00	169.02	0.01020	1.72	724.12	2,000	0.62
Total, tons/yr								4.58

* V = annual water usage per unit in millions of gallons per year

B3. Solid Waste

B3a. Fugitive Emissions

Emissions of carbon dioxide from solid waste disposal treatment are calculated using the following equation:

$$Y_a = (P_w)(E)$$

Y_a = annual emissions of carbon dioxide from solid waste disposal treatment, tons/yr.
P_w = annual waste production for disposal treatment, tons/yr.
E = emission factor for waste production, 0.0045 tons/ton (Los Angeles County, Engineering Data).

Unit Type	Q, tons/yr	unit	Unit Type	Unit number	P _w tons/yr	E, tons/ton	Y _a tons/yr
Residential	0.8700	household		4.05	3,545.25	0.0045	15.95
Food Store	0.0000	sq ft		0	0.00	0.0045	0.00
Restaurant	0.0000	sq ft		0	0.00	0.0045	0.00
Hospitals	0.0000	sq ft		0	0.00	0.0045	0.00
Retail	0.0004	sq ft		387,000	154.80	0.0045	0.70
Commercial	0.0004	sq ft		0	0.00	0.0045	0.00
College/University	0.0000	sq ft		0	0.00	0.0045	0.00
High school	0.0000	sq ft		0	0.00	0.0045	0.00
Elementary School	0.0000	sq ft		0	0.00	0.0045	0.00
Office	0.0000	sq ft		0	0.00	0.0045	0.00
Hotel/Motel	0.2800	room		0	0.00	0.0045	0.00
Warehouse	0.0000	sq ft		0	0.00	0.0045	0.00
Miscellaneous	0.0000	sq ft		0	0.00	0.0045	0.00
Total, tons/yr							16.65

* Q = annual waste production per unit based on daily waste per unit type (City of Los)

B3b. Exhaust Emissions (Hauling Trucks)

Emissions of carbon dioxide from solid waste transportation are calculated using the following equation:

$$Y_A = (P_A)(d)^{-1}(Ca)^{-1}(M)(E)(C_1)^{-1}(C_2)^{-1}$$

- Y_A = annual emissions of carbon dioxide from solid waste transportation, tons/yr.
- P_A = annual waste production for disposal treatment, tons/yr (see B3a. Fugitive Emissions).
- d = solid waste density, 0.0365 tons/cuyd (California Integrated Waste Management Board).
- Ca = truck load capacity, 20 cuyd/rip.
- M = average trip mileage, 31.83 miles/rip.
- E = emission factor for hauling trucks, 1,637.871 gr/mile (EMFAC 2007 output file).
- C₁ = conversion factor from gr to lbs, 453.59 gr/lbs.
- C₂ = conversion factor from lbs to tons, 2,000 lbs/ton.

Unit Type	P _A , tons/yr	d, tons/cuyd	Ca, cuyd/rip	M, miles/rip	E, gr/mile**	C ₁ , gr/lbs	C ₂ , lbs/tons	Y _A , tons/yr
Residential	3,545.25	0.0365	20	2.30	1,637.871	453.59	2,000	20.17
Food Store	0.00	0.0365	20	2.30	1,637.871	453.59	2,000	0
Restaurant	0.00	0.0365	20	2.30	1,637.871	453.59	2,000	0
Hospitals	0.00	0.0365	20	2.30	1,637.871	453.59	2,000	0
Retail	154.80	0.0365	20	2.30	1,637.871	453.59	2,000	0.88
Commercial	0.00	0.0365	20	2.30	1,637.871	453.59	2,000	0
College/University	0.00	0.0365	20	2.30	1,637.871	453.59	2,000	0
High School	0.00	0.0365	20	2.30	1,637.871	453.59	2,000	0
Elementary School	0.00	0.0365	20	2.30	1,637.871	453.59	2,000	0
Office	0.00	0.0365	20	2.30	1,637.871	453.59	2,000	0
Hotel/Motel	0.00	0.0365	20	2.30	1,637.871	453.59	2,000	0
Warehouse	0.00	0.0365	20	2.30	1,637.871	453.59	2,000	0
Miscellaneous	0.00	0.0365	20	2.30	1,637.871	453.59	2,000	0
Total, tons/yr								21.05

* M = average trip mileage based on the average round trip distance from the Landfill with jurisdiction over the site; California Integrated Waste Management Board (<http://www.ciwm.ca.gov>)
 ** E = emission factor for hauling trucks based on the following EMFAC criteria: 2008 calendar year, all heavy-duty trucks, temperature of 43°F, relative humidity of 74% (average between 63% and 84%, January AM and PM), and speed of 45 miles/hr.

B3c. Exhaust Emissions (Disposal Equipment)

Emissions of carbon dioxide from solid waste disposal are calculated using the following equation:

$$Y_A = (E)(h)(n)(C)^{-1}$$

- Y_A = annual emissions of carbon dioxide from solid waste disposal, tons/yr.
- E = emission factor for disposal equipment, lbs/hr (SCAQMD Off-Road Mobile Source Emission Factors, 2007).
- h = operating hours per day, 2 hrs/day.
- n = days per year, 365 days/yr.
- C = conversion factor from lbs to tons, 2,000 lbs/ton.

Vehicle Type	E, lbs/hr	h, hrs/day**	n, days/yr	C, lbs/tons	Y _A , tons/yr
Excavator	119.60	2	365	2,000	0.00
Grader	132.70	2	365	2,000	0.00
Off-Highway Tractor	151.50	2	365	2,000	0.00
Off-Highway Truck	260.10	2	365	2,000	0.00
Total, tons/yr					0.00

* E = emission factor for disposal equipment based on the composite emission factor for each vehicle type.
 ** h = operating hours per day (and vehicle fleet) are based on typical operating time (and vehicle fleet) necessary to dispose 5.11 tons of solid waste per day.

B4. Wastewater

Emissions of carbon dioxide from waste water treatment are calculated using the following equation:

$$Y_{A2} = (Y_{A1})(R_{W1})$$

- Y_{A2} = annual emissions of carbon dioxide from waste water treatment, tons/yr.
- Y_{A1} = annual emissions of carbon dioxide from electricity used for potable water treatment and transportation, tons/yr.
- R_{W1} = ratio between potable water usage and waste water production, 0.50 (USEPA, 1992).

Y _{A1} , tons/yr	R _{W1} *	Y _{A2} , tons/yr
4.58E+00	0.50	2.29

* R_{W1} = ratio between water usage and waste water production based on the ratio between indoor water usage and total water usage per household under the assumption that emissions from potable water treatment and transportation for domestic use are equal to emissions from waste water transportation and treatment.

C. Summary Table

Source Type	Emissions, tons/yr
Direct	
Mobile and stationary	93561.22
Total direct, tons/yr	93561.22
Indirect	
Electricity	10273.62
Potable water	4.58
Solid waste	37.70
Wastewater	2.29
Total indirect, tons/yr	103118.40
Total, tons/yr	196679.62
Global warming potential index	1
Global warming potential, tons/yr	196679.62

Methane

A. Direct Sources

A1. Mobile Source (Construction Equipment)

Emissions of methane from construction equipment are calculated using the following equation:

$$Y_A = (M)^n(E)(C_1)^{-1}(C_2)^{-1}$$

- Y_A = annual emissions of methane from construction equipment, tons/yr.
- M = annual mileage for construction equipment, miles/yr.
- E = emission factor for construction equipment, 0.2012 gr/mile (USEPA Direct Emissions from Mobile Combustion Sources, Climate Leaders, 2004).
- C₁ = conversion factor from gr to lbs, 453.59 gr/lbs.
- C₂ = conversion factor from lbs to tons, 2,000 lbs/ton.

Unit Type	M, miles/yr	E, gr/mile	C ₁ , gr/lbs	C ₂ , lbs/tons	Y _A , tons/yr
Non cat heavy-duty truck	416,625.00	0.2012	453.59	2,000	0.09

M = annual mileage for construction equipment based on the ratio between annual emissions of carbon dioxide from construction equipment (URBEMIS 2007 9.2.2 output file) and the emission factor for carbon monoxide from construction equipment based on the following EMFAC criteria: 2008 calendar year, all heavy-duty trucks, temperature of 43°F, relative humidity of 74% (average between 63% and 84%, January AM and PM), and speed of 10 miles/hr.

A2. Mobile Source (Motor Vehicles)

Emissions of methane from motor vehicles are calculated using the following equation:

$$Y_A = (M)^n(E)(C_1)^{-1}(C_2)^{-1}$$

- Y_A = annual emissions of methane from motor vehicles, tons/yr.
- M = annual mileage for motor vehicles, miles/yr (URBEMIS 2007 9.2.2 output file).
- E = emission factor for motor vehicles, gr/mile (USEPA Direct Emissions from Mobile Combustion Sources, Climate Leaders, 2004).
- C₁ = conversion factor from gr to lbs, 453.59 gr/lbs.
- C₂ = conversion factor from lbs to tons, 2,000 lbs/ton.

Unit Type	M, miles/yr	E, gr/mile	C ₁ , gr/lbs	C ₂ , lbs/tons	Y _A , tons/yr
Non cat passenger car	0.00	0.1931	453.59	2,000	0.00
Cat passenger car	772,507.44	0.1127	453.59	2,000	9.60
Diesel passenger car	0.00	0.0161	453.59	2,000	0.00
Non cat light-duty truck	0.00	0.2253	453.59	2,000	0.00
Cat light-duty truck	7,019,150.51	0.1448	453.59	2,000	11.20
Diesel light-duty truck	0.00	0.0966	453.59	2,000	0.00
Non cat heavy-duty truck	0.00	0.2012	453.59	2,000	0.00
Cat heavy-duty truck	547,348.91	0.1448	453.59	2,000	0.87
Diesel heavy-duty truck	402,490.58	0.0161	453.59	2,000	0.07
Non cat motorcycles	128,717.52	0.2092	453.59	2,000	0.30
Cat motorcycles	27,968.24.95	0.2092	453.59	2,000	0.63
Total, tons/yr					22.67

A3. Mobile Source (Landscape Equipment)

Emissions of methane from landscape equipment are calculated using the following equation:

$$Y_{A2} = (Y_{A1})^n(R_1)$$

- Y_{A2} = annual emissions of methane from landscape equipment, tons/yr.
- Y_{A1} = annual emissions of methane from motor vehicles, tons/yr.
- R₁ = ratio between carbon monoxide unmitigated emissions from motor vehicles and carbon monoxide unmitigated emissions from landscape equipment, (URBEMIS 2007 9.2.2 output file).

Y _{A1} , tons/yr	R ₁	Y _{A2} , tons/yr
22.67	0.00007	0.00

A4. Stationary Source (Cooling and Heating)

Emissions of methane from cooling and heating are calculated using the following equation:

$$Y_A = (U_n)^n(E)(C)^{-1}$$

- Y_A = annual emissions of methane from cooling and heating, tons/yr.
- U_n = annual natural gas usage, MMBTU/yr.
- E = emission factor for natural gas usage, 0.0059 kg/MMBTU (California Climate Action Registry General Reporting Protocol, Version 2.2, Part III, Chapter 8, 2007).
- C = conversion factor from kg to tons, 907.18 kg/ton.

Land Use Type	R _n	Unit	A **	Unit	U _n , MMBTU/yr	E, kg/MMBTU	C, kg/ton	Y _A , tons/yr
SF Residential	83,979.00	MMBTU/unit	335.00	household	28,132.97	0.0059	907.18	0.18
MF Residential	59,544.00	MMBTU/unit	3,740.00	household	189,037.93	0.0059	907.18	1.23
Food Store	0.03654	MMBTU/unit	0.00	sq ft	0.00	0.0059	907.18	0.00
Restaurant	0.03654	MMBTU/unit	0.00	sq ft	0.00	0.0059	907.18	0.00
Hospital	0.03654	MMBTU/unit	0.00	sq ft	0.00	0.0059	907.18	0.00
Retail	0.03654	MMBTU/unit	387,000.00	sq ft	14,140.58	0.0059	907.18	0.09
Commercial	0.03654	MMBTU/unit	0.00	sq ft	0.00	0.0059	907.18	0.00
College/University	0.06048	MMBTU/unit	0.00	sq ft	0.00	0.0059	907.18	0.00
High school	0.06048	MMBTU/unit	0.00	sq ft	0.00	0.0059	907.18	0.00
Elementary School	0.06048	MMBTU/unit	0.00	sq ft	0.00	0.0059	907.18	0.00
Office	0.02520	MMBTU/unit	0.00	sq ft	0.00	0.0059	907.18	0.00
Hotel/Motel	0.06048	MMBTU/unit	0.00	room	0.00	0.0059	907.18	0.00
Warehouse	0.00000	MMBTU/unit	0.00	sq ft	0.00	0.0059	907.18	0.00
Miscellaneous	0.00000	MMBTU/sqft	680,000.00	sq ft	0.00	0.0059	907.18	0.00
Total, tons/yr								1.50

** R_n = annual consumption rate (CEQA Handbook, Table A9-12-A). Converted from cubic feet/unit/month to MMBTU/Unit/year
 ** A = unit type number (number of units)

B. Indirect Sources

B1. Electricity

Emissions of methane from electricity usage are calculated using the following equation:

$$Y_A = (U_n)^n(E)(C)^{-1}$$

- Y_A = annual emissions of methane from electricity usage, tons/yr.
- U_n = annual electricity usage, MWh/yr.
- E = emission factor for electricity usage, 0.0067 lbs/MWh (California Climate Action Registry General Reporting Protocol, Version 2.2, Part III, Chapter 6, 2007).
- C = conversion factor from lbs to tons, 2,000 lbs/ton.

Land Use Type	R _n	Unit	A **	Unit	U _n , MWh/yr	E, lbs/MWh	C, lbs/ton	Y _A , tons/yr
Residential	5.6265	MWh/unit/yr	4,075	units	22,927.99	0.0067	2,000	0.08
Food Store	0.0410	MWh/sqft/yr	0	sqft	0.00	0.0067	2,000	0.00
Restaurant	0.0402	MWh/sqft/yr	0	sqft	0.00	0.0067	2,000	0.00
Hospital	0.0198	MWh/sqft/yr	0	sqft	0.00	0.0067	2,000	0.00
Retail	0.0141	MWh/sqft/yr	387,000	sqft	5,458.70	0.0067	2,000	0.02
College/University	0.0124	MWh/sqft/yr	0	sqft	0.00	0.0067	2,000	0.00
High school	0.0075	MWh/sqft/yr	0	sqft	0.00	0.0067	2,000	0.00
Elementary School	0.0075	MWh/sqft/yr	0	sqft	0.00	0.0067	2,000	0.00
Office	0.0131	MWh/sqft/yr	0	sqft	0.00	0.0067	2,000	0.00
Hotel/Motel	0.0177	MWh/sqft/yr	0	sqft	0.00	0.0067	2,000	0.00
Warehouse	0.0121	MWh/sqft/yr	0	sqft	0.00	0.0067	2,000	0.00
Miscellaneous	0.0200	MWh/sqft/yr	0	sqft	0.00	0.0067	2,000	0.00
Construction	13.6300	MWh/sqft/yr	0	sqft	0.00	0.0067	2,000	0.00
Total, tons/yr								0.10

** R_n = annual consumption rate (CEQA Handbook, Table A9-11-A). Converted from kWh/unit/year to MWh/Unit/year
 ** A = unit type number, (number of units)

B4. Wastewater

Emissions of methane from waste water treatment are calculated using the following equation:

$$Y_{CH_4} = (Y_{CH_4}) \cdot (R_{Wt})$$

Y_{CH_4} = annual emissions of methane from waste water treatment, tons/yr.

Y_{CH_4} = annual emissions of methane from electricity used for potable water treatment and transportation, tons/yr.

R_{Wt} = ratio between potable water usage and waste water production, 0.56 (USEPA, 1992).

Y_{CH_4} , tons/yr	R_{Wt}	Y_{CH_4} , tons/yr
1,395.09	0.56000	0,781.25

R_{Wt} = ratio between water usage and waste water production based on the ratio between indoor water usage and total water usage per household under the assumption that emissions from potable water treatment and transportation for domestic use are equal to emissions from waste water transportation and treatment.

C. Summary Table

Source Type	Emissions, tons/yr	Emissions tons/yr (GWP)
Direct		
Construction equipment	0.09	1.89
Motor vehicles	22.67	476.07
Landscape equipment	1.99E-03	0.03
Cooling and heating	1.59	31.59
Total direct, tons/yr	24.27	509.59
Indirect		
Electricity	0.10	2.00
Potable water	1.40	29.30
Solid waste	16.97	356.42
Wastewater	0.75	16.41
Total indirect, tons/yr	19.24	404.12
Total, tons/yr	43.51	913.71
Global warming potential index	21	21
Global warming potential, tons/yr	913.71	19,167.90

Nitrous Oxide

A. Direct Sources

A1. Mobile Source (Construction Equipment)

Emissions of nitrous oxide from construction equipment are calculated using the following equation:

$$Y_{N_2O} = (M)^*(E)^*(C_1)^{-1}*(C_2)^{-1}$$

Y_{N_2O} = annual emissions of nitrous oxide from construction equipment, tons/yr.

M = annual mileage for construction equipment, miles/yr.

E = emission factor for construction equipment, 0.0048 gr/mile (USEPA Direct Emissions from Mobile Combustion Sources, Climate Leaders, 2004).

C_1 = conversion factor from gr to lbs, 453.59 gr/lbs.

C_2 = conversion factor from lbs to tons, 2,000 lbs/ton.

Unit Type	M, miles/yr	E, gr/mile	C ₁ , gr/lbs	C ₂ , lbs/tons	Y _{N₂O} , tons/yr
Non car heavy-duty truck	416625.00	0.0048	453.59	2,000	0.00220

M = annual mileage for construction equipment based on the ratio between annual emissions of carbon dioxide from construction equipment (URBEMIS 2007 9.2.2 output file) and the emission factor for carbon monoxide from construction equipment based on the following EMFAC criteria: 2008 calendar year, all heavy-duty trucks, temperature of 43°F, relative humidity of 74% (average between 63% and 84%, January AM and PM), and speed of 10 miles/hr.

A2. Mobile Source (Motor Vehicles)

Emissions of nitrous oxide from motor vehicles are calculated using the following equation:

$$Y_{N_2O} = (M)^*(E)^*(C_1)^{-1}*(C_2)^{-1}$$

Y_{N_2O} = annual emissions of nitrous oxide from motor vehicles, tons/yr.

M = annual mileage for motor vehicles, miles/yr (URBEMIS 2007 9.2.2 output file).

E = emission factor for motor vehicles, gr/mile (USEPA Direct Emissions from Mobile Combustion Sources, Climate Leaders, 2004).

C_1 = conversion factor from gr to lbs, 453.59 gr/lbs.

C_2 = conversion factor from lbs to tons, 2,000 lbs/ton.

Unit Type	M, miles/yr	E, gr/mile	C ₁ , gr/lbs	C ₂ , lbs/tons	Y _{N₂O} , tons/yr
Non car passenger car	0.00	0.0166	453.59	2,000	0.00000
Car passenger car	7727507.44	0.0519	453.59	2,000	4.41241
Diesel passenger car	0.00	0.0161	453.59	2,000	0.00000
Non car light-duty truck	0.00	0.0208	453.59	2,000	0.00000
Car light-duty truck	70191510.51	0.0649	453.59	2,000	5.02153
Diesel light-duty truck	0.00	0.0483	453.59	2,000	0.00000
Non car heavy-duty truck	0.00	0.0480	453.59	2,000	0.00000
Car heavy-duty truck	5473469.91	0.1499	453.59	2,000	0.96042
Diesel heavy-duty truck	4024903.56	0.0322	453.59	2,000	0.14286
Non car motorcycles	1287917.62	0.0073	453.59	2,000	0.01036
Car motorcycles	2736624.96	0.0073	453.59	2,000	0.02202
Total, tons/yr					16.51360

A3. Mobile Source (Landscape Equipment)

Emissions of nitrous oxide from landscape equipment are calculated using the following equation:

$$Y_{N_2O} = (Y_{N_2O}) \cdot (R_1)$$

Y_{N_2O} = annual emissions of nitrous oxide from landscape equipment, tons/yr.

Y_{N_2O} = annual emissions of nitrous oxide from motor vehicles, tons/yr.

R_1 = ratio between carbon monoxide unmitigated emissions from motor vehicles and carbon monoxide unmitigated emissions from landscape equipment, (URBEMIS 2007 9.2.2 output file)

Y_{N_2O} , tons/yr	R_1	Y_{N_2O} , tons/yr
10.51	0.00007	7.40E-04

B3b. Exhaust Emissions (Disposal Equipment)

Emissions of nitrous oxide from solid waste disposal are calculated using the following equations:

$$Y_A = (E)(h)(n)(C)^1$$

Y_A = annual emissions of nitrous oxide from solid waste disposal, tons/yr.

E = emission factor for disposal equipment, lbs/hr (SCAQMD Off-Road Mobile Source Emission Factors, 2007).

h = operating hours per day, 2 hrs/day.

n = days per year, 365 days/yr.

C = conversion factor from lbs to tons, 2,000 lbs/ton.

Vehicle Type	E, lbs/hr *	h, hrs/day **	n, days/yr	C, lbs/tons	Y _{dis} , tons/yr
Excavator	1.3249	2	365	2,000	0.48
Grader	1.6191	2	365	2,000	0.59
Off-Highway Tractor	2.1767	2	365	2,000	0.79
Off-Highway Truck	2.7256	2	365	2,000	0.95
Total, tons/yr					2.85

* E = emission factor for disposal equipment based on the composite nitrogen oxide emission factor for each vehicle type.

** h = operating hours per day (and vehicle fleet) are based on typical operating time (and vehicle fleet) necessary to dispose 5.11 tons of solid waste per day.

B4. Wastewater

Emissions of nitrous oxide from waste water treatment are calculated using the following equation:

$$Y_{A2} = (Y_{A1})(R_{w1})$$

Y_{A2} = annual emissions of nitrous oxide from waste water treatment, tons/yr.

Y_{A1} = annual emissions of nitrous oxide from electricity used for potable water treatment and transportation, tons/yr.

R_{w1} = ratio between potable water usage and waste water production, 0.56 (USEPA, 1992).

Y _{A1} , tons/yr	R _{w1} *	Y _{A2} , tons/yr
7.70E-01	0.56	4.31E-01

* R_{w1} = ratio between water usage and waste water production based on the ratio between indoor water usage and total water usage per household under the assumption that emissions from potable water treatment and transportation for domestic use are equal to emissions from waste water transportation and treatment.

C. Summary Table

Source Type	Emissions, tons/yr	Emissions, tons/yr (GWP)
Direct		
Construction equipment	0.00220	0.68324
Motor vehicles	10.51360	3259.216
Landscape equipment	0.00074	0.2294
Cooling and heating	0.02550	7.90438
Total direct, tons/yr	10.54204	3268.03302
Indirect		
Electricity	0.95251	16.2761
Potable water	0.77043	238.8327438
Solid waste	2.85008	883.5191208
Wastewater	0.43144	133.7463368
Total indirect, tons/yr	4.10444	1272.373306
Total, tons/yr	14.64648	4540.40932
Global warming potential index	310	
Global warming potential, tons/yr	4540.40932	7606.44

**Renaissance Potential Net Development
Input data for Green House Gas Emissions
Mitigated**

Carbon Dioxide

A. Direct Sources

A1. Mobile (Construction Equipment, Motor Vehicles, and Landscape Equipment) and Stationary Sources (Cooling and Heating)

Emissions of carbon dioxide from mobile (construction equipment, motor vehicles, and landscape equipment) and stationary sources (cooling and heating) are calculated using the following equation:

$$Y_A = (Y_1)+(Y_2)+(Y_3)+(Y_4)$$

Y_A = mitigated annual emissions of carbon dioxide from mobile and stationary sources, tons/yr.

Y₁ = mitigated annual emissions of carbon dioxide from construction equipment, tons/yr (URBEMIS 2007 9.2.2 output file).

Y₂ = mitigated annual emissions of carbon dioxide from motor vehicles, tons/yr (URBEMIS 2007 9.2.2 output file).

Y₃ = mitigated annual emissions of carbon dioxide from landscape equipment, tons/yr (URBEMIS 2007 9.2.2 output file).

Y₄ = mitigated annual emissions of carbon dioxide from cooling and heating, tons/yr (URBEMIS 2007 9.2.2 output file).

Y ₁ , tons/yr	Y ₂ , tons/yr	Y ₃ , tons/yr	Y ₄ , tons/yr	Y _A , tons/yr
677.45	77,601.49	0.00	8,506.67	86,785.61
Reduction percentage, %				7.24

Additional reductions beyond Urbemis

Heating & Cooling & Transportation

Red₁ = Building design shall incorporate basic or enhanced insulation such that heat transfer and thermal bridging is minimized (20% reduction in heating. Heating is a percentage of total electric, therefore reduction is heating percentage * reduction pe

Red₂ = Limit air leakage through the structure or within the heating & cooling distribution system (%reduction). Heating is a percentage of total electric, therefore reduction is heating percentage * reduction percentage)

Red₃ = Residential buildings meet or exceed ENERGY STAR rated windows. This will reduce heat/cooling energy usage. Heating is a percentage of total electric, reduction = Mitigation reduction * Heating % of total electrical usage. (% reduction)

Red₄ = Residential buildings meet or exceed ENERGY STAR rated heating and cooling units. This will reduce heat/cooling energy usage. Heating is a percentage of total electric, reduction = Mitigation reduction * Heating % of total electrical usage. (% r

Red₅ = Plant shade trees around main buildings to reduce direct sunlight into the structures (% reduction)

B. Indirect Sources

B1. Electricity

Emissions of carbon dioxide from electricity usage are calculated using the following equation:

$$Y_{MA} = (Y_{UA}) * (1 - Red)$$

Y_{MA} = mitigated annual emissions of carbon dioxide from electricity usage, tons/yr.

Y_{UA} = unmitigated annual emissions of carbon dioxide from electricity usage, tons/yr.

Red_1 = Title 24 reduction proportion, (URBEMIS 2007 9.2.2 output file). *Note if mitigated in Urbemis, d 0.2 20 %

Red_2 = Proposed residential buildings meet or exceeds the performance of an energy star labeled home (5% reduction) RESIDENTIAL ONLY

Red_3 = Residential buildings meet or exceed Energy Star rated light fixtures (?% reduction)

Red_4 = Residential buildings meet or exceed Energy Star rated appliances (?% reduction)

Red_5 = Installation and operation of renewable electric generation systems (?% reduction)

Red_6 = Installation and operation of energy efficient domestic hot water systems (5% reduction)

Red_7 = All lighting is fluorescent: Non-Residential Land Uses (?% reduction)

Red_8 = Reduction from use of solar panels

Land Use Type	Y_{UA} , tons/yr	Red_1	Red_2	Red_3	Red_4	Red_5	Red_6	Red_7	Red_8	Y_{MA} , tons/yr
SF Residential	682.44	129.66360	27.639	0.000	0.000	0.000	24.944		0	500.19
MF Residential	7,618.87	1447.58530	308.564	0.000	0.000	0.000	278.479		0	5,584.24
Food Store	0.00	0.00000				0.000	0.000	0	0	0.00
Restaurant	0.00	0.00000				0.000	0.000	0	0	0.00
Hospitals	0.00	0.00000				0.000	0.000	0	0	0.00
Retail	1,970.05	55.16140				0.000	53.617	0	0	1,861.27
College/University	0.00	0.00000				0.000	0.000	0	0	0.00
High school	0.00	0.00000				0.000	0.000	0	0	0.00
Elementary School	0.00	0.00000				0.000	0.000	0	0	0.00
Office	0.00	0.00000				0.000	0.000	0	0	0.00
Hotel/Motel	0.00	0.00000				0.000	0.000	0	0	0.00
Warehouse	0.00	0.00000				0.000	0.000	0	0	0.00
Open Space	2.46	0.00000				0.000	0.000	0	0	2.46
Commercial	0.00	0.00000				0.000	0.000	0	0	0.00
Total mitigated tons per year										7,948.17
Reduction percentage, %										22.64

B2. Potable Water

Emissions of carbon dioxide from potable water treatment and transportation for domestic use are calculated using the following equation:

$$Y_{MA} = (Y_{UA}) * (1 - (Red_1 + Red_2))$$

Y_{MA} = mitigated annual emissions of carbon dioxide from electricity used for potable water treatment and transportation, tons/yr.

Y_{UA} = unmitigated annual emissions of carbon dioxide from electricity used for potable water treatment and transportation, tons/yr.

Red_1 = xeriscape landscaping reduction proportion, 0.35 (California Integrated Waste Management Board, Publication No. 442-96-033, 1996) for single family residential.

Red_2 = low flush toilet reduction proportion, 0.03 (Riverside Public Utilities, Engineering Data).

Red_3 = Incorporate water-efficient irrigation controls (20% reduction)

Red_4 = Use reclaimed water for landscape irrigation (?% reduction)

Red_5 = Includes measures to be water-efficient (water-efficient fixtures & appliances) (3% reduction)

Land Use Type	Y_{UA} , tons/yr	Red_1	Red_2	Red_3	Red_4	Red_5	Y_{MA} , tons/yr
SF Residential	0.32	0.10510	0.006	0.039	0.000	0.005	0.16
MF Residential	3.53	1.17337	0.067	0.435	0.000	0.053	1.80
Food Store	0.00	0.00000	0.000	0.000	0.000	0.000	0.00
Restaurant	0.00	0.00000	0.000	0.000	0.000	0.000	0.00
Hospitals	0.00	0.00000	0.000	0.000	0.000	0.000	0.00
Retail	0.11	0.02249	0.002	0.010	0.000	0.001	0.08
Commercial	0.00	0.00000	0.000	0.000	0.000	0.000	0.00
College/University	0.00	0.00000	0.000	0.000	0.000	0.000	0.00
High school	0.00	0.00000	0.000	0.000	0.000	0.000	0.00
Elementary School	0.00	0.00000	0.000	0.000	0.000	0.000	0.00
Office	0.00	0.00000	0.000	0.000	0.000	0.000	0.00
Hotel/Motel	0.00	0.00000	0.000	0.000	0.000	0.000	0.00
Warehouse	0.00	0.00000	0.000	0.000	0.000	0.000	0.00
Open Space	0.62	0.21847	0.000	0.012	0.000	0.000	0.39
Total mitigated tons per year							2.43
Reduction percentage, %							46.8834

* Red_2 = low flush toilet reduction proportion based on the ratio between the daily water saving of 22 gals per household and the daily water usage of 700 gals per household.

B3. Solid Waste

B3a. Fugitive Emissions

Emissions of carbon dioxide from solid waste disposal treatment are calculated using the following equation:

$$Y_{MA} = (Y_{UA}) * (1 - Red_1) * (1 - Red_2)$$

Y_{MA} = mitigated annual emissions of carbon dioxide from solid waste disposal treatment, tons/yr.

Y_{UA} = unmitigated annual emissions of carbon dioxide from solid waste disposal treatment, tons/yr.

Red_1 = Los Angeles-County Recycling Program reduction proportion, 0.50.

Red_2 = Providing educational and publicity material for reducing waste (.03 reduction).

Y_{UA} , tons/yr	Red_1	Red_2	Y_{MA} , tons/yr
16.65	8.32500	0.24975	8.08
Reduction percentage, %			51.5000

B3b. Exhaust Emissions (Hauling Trucks)

Emissions of carbon dioxide from solid waste transportation are not reduced by any mitigation measures; therefore, emissions of carbon dioxide from solid waste transportation equal to **10.84** tons/yr.

B3c. Exhaust Emissions (Disposal Equipment)

Emissions of carbon dioxide from solid waste disposal are not reduced by any mitigation measures; therefore, emissions of carbon dioxide from solid waste disposal equal to **0.00** tons/yr.

B4. Wastewater

Emissions of carbon dioxide from waste water treatment are calculated using the following equation:

$$Y_{MA1} = (Y_{UM1}) * (R_{w1})$$

Y_{UM1} = unmitigated tons/yr.

Y_{MA} = mitigated annual emissions of carbon dioxide from electricity used for potable water treatment and transportation, tons/yr.

Red₁ = xeriscape landscaping reduction proportion, 0.35 (California Integrated Waste Management Board, Publication No. 442-96-033, 1996) for single family residential.

Red₂ = low flush toilet reduction proportion, 0.03 (Riverside Public Utilities, Engineering Data).

Red₃ = Includes measures to be water-efficient (water-efficient fixtures & appliances) (3% reduction)

Y _{UM1} , tons/yr	Red ₁	Red ₂	Red ₃	Y _{MA1} , tons/yr
1.92	0.63923	0.004	0.036	1.24
0.06	0.01124	0.001	0.001	0.04
0.31			0.005	0.31
Reduction percentage, %				30.42

C. Summary Table

Source Type	Emissions, tons/yr	GWP tons/yr
Direct	86,785.61	86,785.61
Total direct, tons/yr	86,785.61	
Indirect	7,948.17	7,948.17
Electricity	2.43	2.43
Potable water	18.92	18.92
Solid waste	1.24	1.24
Wastewater		
Total indirect, tons/yr	7,970.76	
Total, tons/yr	94,756.37	
Reduction percentage, %	8.78	
Global warming potential index	1	
Global warming potential, tons/yr	94,756.37	

Methane

A. Direct Sources

A1. Mobile Source (Construction Equipment)

Emissions of methane from construction equipment are not reduced by any mitigation measures; therefore, emissions of methane from construction equipment equal to **0.09** tons/yr.

A2. Mobile Source (Motor Vehicles)

Emissions of methane from motor vehicles are calculated using the following equation:

$$Y_{MA} = (M_M) * (E) * (C_1)^{-1} * (C_2)^{-1}$$

Y_{MA} = mitigated annual emissions of methane from motor vehicles, tons/yr.

M_M = mitigated annual mileage for motor vehicles, miles/yr (URBEMIS 2007 9.2.2 output file).

E = emission factor for motor vehicles, gr/mile (USEPA Direct Emissions from Mobile Combustion Sources, Climate Leaders, 2004).

C₁ = conversion factor from gr to lbs, 453.59 gr/lbs.

C₂ = conversion factor from lbs to tons, 2,000 lbs/ton.

Red₁ = Promote ride sharing programs for all tenants: **Non-Residential Land Uses** Transportation only; Reduction = %reduction*%vehicle emissions from total use (% reduction)

Red₂ = Provide Adequate bicycle parking near building entrances: **Non-Residential Land Uses** Transportation only; Reduction = %reduction*%vehicle emissions from total use (% reduction)

Red₃ = Idling is limited to less than 5 minutes: **Non-Residential Land Uses** Transportation only; Reduction = %reduction*%vehicle emissions from total use (% reduction)

*Note all reductions are accounted for in Urbemis.

Unit Type	M _M , miles/yr	E, gr/mile	C ₁ , gr/lbs	C ₂ , lbs/tons	Y _{MA} , tons/yr
Non cat passenger car	0.00	0.1931	453.59	2,000	0.00
Cat passenger car	72915853.92	0.1127	453.59	2,000	9.06
Diesel passenger car	0.00	0.0161	453.59	2,000	0.00
Non cat light-duty truck	0.00	0.2253	453.59	2,000	0.00
Cat light-duty truck	66231900.64	0.1448	453.59	2,000	10.57
Diesel light-duty truck	0.00	0.0966	453.59	2,000	0.00
Non cat heavy-duty truck	0.00	0.2012	453.59	2,000	0.00
Cat heavy-duty truck	5,164,721.08	0.1448	453.59	2,000	0.82
Diesel heavy-duty truck	3,797,852.63	0.0161	453.59	2,000	0.07
Non cat motorcycles	1,215,264.23	0.2092	453.59	2,000	0.28
Cat motorcycles	2,582,436.49	0.2092	453.59	2,000	0.60
Total, tons/yr					21.40
Reduction percentage, %					5.60

A3. Mobile Source (Landscape Equipment)

Emissions of methane from landscape equipment are calculated using the following equation:

$$Y_{MA2} = (Y_{MA1}) \cdot (R_T)$$

Y_{MA2} = mitigated annual emissions of methane from landscape equipment, tons/yr.

Y_{MA1} = Annual emissions of methane from landscape equipment, tons/yr. (from unmitigated)

R_T = % reduction from Urbemis

Y_{MA1} , tons/yr	R_T , %	Y_{MA2} , tons/yr
0.00	1	0.00
Reduction percentage, %		100.00

A4. Stationary Source (Cooling and Heating)

Emissions of methane from cooling and heating are calculated using the following equation:

$$Y_{MA} = (Y_{UA}) \cdot (1 - Red)$$

Y_{MA} = mitigated annual emissions of methane from cooling and heating, tons/yr.

Y_{UA} = unmitigated annual emissions of methane from cooling and heating, tons/yr.

Red_1 = Building design shall incorporate basic or enhanced insulation such that heat transfer and thermal bridging is minimized (20% reduction)

Red_2 = Limit air leakage through the structure or within the heating & cooling distribution system (?%reduction).

Red_3 = Residential buildings meet or exceed ENERGY STAR rated windows. (?% reduction)

Red_4 = Residential buildings meet or exceed ENERGY STAR rated heating and cooling units. (5% reduction)

Red_5 = Plant shade trees around main buildings to reduce direct sunlight into the structures (?% reduction)

Land Use Type	Y_{UA} , tons/yr	Red_1	Red_2	Red_3	Red_4	Red_5	Y_{MA} , tons/yr
SF Residential	0.182968	0.03476	0.000	0.000	0.000	0.000	0.15
MF Residential	1.22944	0.23359	0.000	0.000	0.000	0.000	1.00
Food Store	0	0.00000	0.000				0.00
Restaurant	0	0.00000	0.000				0.00
Hospitals	0	0.00000	0.000				0.00
Retail	0.091968	0.00478	0.000				0.09
Commercial	0	0.00000	0.000				0.00
College/University	0	0.00000	0.000				0.00
High school	0	0.00000	0.000				0.00
Elementary School	0	0.00000	0.000				0.00
Office	0	0.00000	0.000				0.00
Hotel/Motel	0	0.00000	0.000				0.00
Warehouse	0	0.00000	0.000				0.00
Open Space	0	0.00000	0.000				0.00
Total, tons/yr							1.23124
Reduction percentage, %							18.16

B. Indirect Sources

B1. Electricity

Emissions of methane from electricity usage are calculated using the following equation:

$$Y_{MA} = (Y_{UA}) \cdot (1 - Red)$$

Y_{MA} = mitigated annual emissions of methane from electricity usage, tons/yr.

Y_{UA} = unmitigated annual emissions of methane from electricity usage, tons/yr.

$Red1$ = Title 24 reduction proportion, (URBEMIS 2007 9.2.2 output file). *Note if mitigated in Urbemis, do not add mitigation here for it.

$Red2$ = Proposed residential buildings meet or exceeds the performance of an energy star labeled home (5% reduction) RESIDENTIAL ONLY

$Red3$ = Residential buildings meet or exceed Energy Star rated light fixtures (?% reduction)

$Red4$ = Residential buildings meet or exceed Energy Star rated appliances (?% reduction)

$Red5$ = Installation and operation of renewable electric generation systems (?% reduction)

$Red6$ = Installation and operation of energy efficient domestic hot water systems (5% reduction)

$Red7$ = All lighting is fluorescent: Non-Residential Land Uses (?% reduction)

$Red8$ = Reduction from use of solar panels

Land Use Type	Y_{UA} , tons/yr	Red_1	Red_2	Red_3	Red_4	Red_5	Red_6	Red_7	Red_8	Y_{MA} , tons/yr
Residential	0.08	0.00000	0.004	0.000	0.000		0.000	0.000	0.000	0.07
Food Store	0.00	0.00000					0.000	0.000	0.000	0.00
Restaurant	0.00	0.00000					0.000	0.000	0.000	0.00
Hospitals	0.00	0.00000					0.000	0.000	0.000	0.00
Retail	0.02	0.00000					0.000	0.000	0.000	0.02
College/University	0.00	0.00000					0.000	0.000	0.000	0.00
High school	0.00	0.00000					0.000	0.000	0.000	0.00
Elementary School	0.00	0.00000					0.000	0.000	0.000	0.00
Office	0.00	0.00000					0.000	0.000	0.000	0.00
Hotel/Motel	0.00	0.00000					0.000	0.000	0.000	0.00
Warehouse	0.00	0.00000					0.000	0.000	0.000	0.00
Open Space	0.00	0.00000					0.000	0.000	0.000	0.00
Total mitigated tons per year										0.09143
Reduction percentage, %										3.85

B2. Potable Water

Emissions of methane from potable water treatment and transportation for domestic use are calculated using the following equation:

$$Y_{MA} = (Y_{UA}) * (1 - (Red_1 + Red_2))$$

Y_{MA} = mitigated annual emissions of methane from electricity used for potable water treatment and transportation, tons/yr.

Y_{UA} = unmitigated annual emissions of methane from electricity used for potable water treatment and transportation, tons/yr.

Red_1 = xeriscape landscaping reduction proportion, 0.35 (California Integrated Waste Management Board, Publication No. 442-96-033, 1996) for single family residential.

Red_2 = low flush toilet reduction proportion, 0.03 (Riverside Public Utilities, Engineering Data).

Red_3 = Incorporate water-efficient irrigation controls (?% reduction)

Red_4 = Use reclaimed water for landscape irrigation (?% reduction)

Red_5 = Includes measures to be water-efficient (water-efficient fixtures & appliances) (?% reduction)

Land Use Type	YUA, tons/yr	Red ₁	Red ₂	Red ₃	Red ₄	Red ₅	Y _{MA} , tons/yr
SF Residential	0.00098	0.00033	0.000	0.000	0.000	0.000	0.00
MF Residential	0.12212	0.04060	0.000	0.000	0.000	0.000	0.08
Food Store	0.00000	0.00000	0.000	0.000	0.000	0.000	0.00
Restaurant	0.00000	0.00000	0.000	0.000	0.000	0.000	0.00
Hospitals	0.00000	0.00000	0.000	0.000	0.000	0.000	0.00
Retail	1.27200	0.24931	0.000	0.000	0.000	0.000	1.02
Commercial	0.00000	0.00000	0.000	0.000	0.000	0.000	0.00
College/University	0.00000	0.00000	0.000	0.000	0.000	0.000	0.00
High school	0.00000	0.00000	0.000	0.000	0.000	0.000	0.00
Elementary School	0.00000	0.00000	0.000	0.000	0.000	0.000	0.00
Office	0.00000	0.00000	0.000	0.000	0.000	0.000	0.00
Hotel/Motel	0.00000	0.00000	0.000	0.000	0.000	0.000	0.00
Warehouse	0.00000	0.00000	0.000	0.000	0.000	0.000	0.00
Open Space	0.00000	0.00000	0.000	0.000	0.000	0.000	0.00
Total mitigated tons per year							1.10465
Reduction percentage, %							20.82

* Red_2 = low flush toilet reduction proportion based on the ratio between the daily water saving of 22 gals per household and the daily water usage of 700 gals per household.

B3. Solid Waste

B3a. Fugitive Emissions

Emissions of methane from solid waste disposal treatment are calculated using the following equation:

$$Y_{MA} = (Y_{UA}) * (1 - Red_1) * (1 - Red_2)$$

Y_{MA} = mitigated annual emissions of methane from solid waste disposal treatment, tons/yr.

Y_{UA} = unmitigated annual emissions of methane from solid waste disposal treatment, tons/yr.

Red_1 = Los Angeles-County Recycling Program reduction proportion, 0.50.

Red_2 = Providing educational and publicity material for reducing waste (?% reduction).

Y _{UA} , tons/yr	Red ₁	Red ₂	Y _{MA} , tons/yr
16.65	8.33		8.33
Reduction percentage, %			50.00

B3b. Exhaust Emissions (Hauling Trucks)

Emissions of methane from solid waste transportation are not reduced by any mitigation measures; therefore, emissions of methane from solid waste transportation equal to **0.13** tons/yr.

B3c. Exhaust Emissions (Disposal Equipment)

Emissions of methane from solid waste disposal are not reduced by any mitigation measures; therefore, emissions of methane from solid waste disposal equal to **0.16** tons/yr.

B4. Wastewater

Emissions of methane from waste water treatment are calculated using the following equation:

$$Y_{MA1} = (Y_{MA2}) * (R_w)$$

Y_{MA1} = mitigated annual emissions of methane from waste water treatment, tons/yr.

Y_{MA2} = mitigated annual emissions of methane from electricity used for potable water treatment and transportation, tons/yr.

Red_1 = xeriscape landscaping reduction proportion, 0.35 (California Integrated Waste Management Board, Publication No. 442-96-033, 1996) for single family residential.

Red_2 = low flush toilet reduction proportion, 0.03 (Riverside Public Utilities, Engineering Data).

Red_3 = Includes measures to be water-efficient (water-efficient fixtures & appliances) (?% reduction)

Y _{UM1} , tons/yr	Red ₁	Red ₂	Red ₃	Y _{MA} , tons/yr
0.78125	0.25977	0.001	0.000	0.52
Reduction percentage, %				33.43690

C. Summary Table

Source Type		Emissions, tons/yr	GWP tons/yr
Direct	Construction equipment	0.09	1.89
	Motor vehicles	21.40	449.40
	Landscape equipment	0.00	0.03
	Cooling and heating	1.23	25.86
Total direct, tons/yr		22.72	
Indirect	Electricity	0.09	1.92
	Potable water	1.10	23.20
	Solid waste	8.61	180.90
	Wastewater	0.52	10.92
Total indirect, tons/yr		10.33	
Total, tons/yr		33.05	
Reduction percentage, %		24.03	
Global warming potential index		21	
Global warming potential, tons/yr		694.12	694.12

Nitrous Oxide

A. Direct Sources

A1. Mobile Source (Construction Equipment)

Emissions of nitrous oxide from construction equipment are not reduced by any mitigation measures; therefore, emissions of nitrous oxide from construction equipment equal to **0.00** tons/yr.

A2. Mobile Source (Motor Vehicles)

Emissions of nitrous oxide from motor vehicles are calculated using the following equation:

$$Y_{MA} = (M_M)(E)(C_1)^{-1}(C_2)^{-1}$$

Y_{MA} = mitigated annual emissions of nitrous oxide from motor vehicles, tons/yr.

M_M = mitigated annual mileage for motor vehicles, miles/yr (URBEMIS 2007 9.2.2 output file).

E = emission factor for motor vehicles, gr/mile (USEPA Direct Emissions from Mobile Combustion Sources, Climate Leaders, 2004).

C_1 = conversion factor from gr to lbs, 453.59 gr/lbs.

C_2 = conversion factor from lbs to tons, 2,000 lbs/ton.

Red_1 = Promote ride sharing programs for all tenants: **Non-Residential Land Uses** Transportation only; Reduction = %reduction*%vehicle emissions from total use (% reduction)

Red_2 = Provide Adequate bicycle parking near building entrances: **Non-Residential Land Uses** Transportation only; Reduction = %reduction*%vehicle emissions from total use (% reduction)

Red_3 = idling is limited to less than 5 minutes: **Non-Residential Land Uses** Transportation only; Reduction = %reduction*%vehicle emissions from total use (% reduction)

*Note all reductions are accounted for in Urbemis.

Unit Type	M_M , miles/yr	E , gr/mile	C_1 , gr/lbs	C_2 , lbs/tons	Y_{MA} , tons/yr
Non cat passenger car	0.00	0.0166	453.59	2,000	0.00
Cat passenger car	72915853.92	0.0518	453.59	2,000	4.16
Diesel passenger car	0.00	0.0161	453.59	2,000	0.00
Non cat light-duty truck	0.00	0.0208	453.59	2,000	0.00
Cat light-duty truck	66231900.64	0.0649	453.59	2,000	4.74
Diesel light-duty truck	0.00	0.0483	453.59	2,000	0.00
Non cat heavy-duty truck	0.00	0.0480	453.59	2,000	0.00
Cat heavy-duty truck	5164721.08	0.1499	453.59	2,000	0.85
Diesel heavy-duty truck	3797852.63	0.0322	453.59	2,000	0.13
Non cat motorcycles	1215264.23	0.0073	453.59	2,000	0.01
Cat motorcycles	2582436.49	0.0073	453.59	2,000	0.02
Total, tons/yr					9.91
Reduction percentage, %					5.74

A3. Mobile Source (Landscape Equipment)

Emissions of nitrous oxide from landscape equipment are calculated using the following equation:

$$Y_{MA2} = (Y_{MA1})(R_T)$$

Y_{MA2} = mitigated annual emissions of nitrous oxide from landscape equipment, tons/yr.

Y_{MA1} = Annual emissions of nitrous oxide from landscape equipment, tons/yr. (directly from unmitigated)

R_T = ratio between carbon monoxide unmitigated emissions from motor vehicles and carbon monoxide unmitigated emissions from landscape equipment, 0.00064 (URBEMIS 2007 9.2.2 output file).

Y_{MA1} , tons/yr	R_T	Y_{MA2} , tons/yr
0.00074	1.00000	0.001
Reduction percentage, %		100.00

A4. Stationary Source (Cooling and Heating)

Emissions of nitrous oxide from cooling and heating are calculated using the following equation:

$$Y_{MA} = (Y_{UA})(1-Red)$$

Y_{MA} = mitigated annual emissions of nitrous oxide from cooling and heating, tons/yr.

Y_{UA} = unmitigated annual emissions of nitrous oxide from cooling and heating, tons/yr.

Red_1 = Building design shall incorporate basic or enhanced insulation such that heat transfer and thermal bridging is minimized (20% reduction)

Red_2 = Limit air leakage through the structure or within the heating & cooling distribution system (?%reduction).

Red_3 = Residential buildings meet or exceed ENERGY STAR rated windows. (?% reduction)

Red_4 = Residential buildings meet or exceed ENERGY STAR rated heating and cooling units. (5% reduction)

Red_5 = Plant shade trees around main buildings to reduce direct sunlight into the structures (?% reduction)

Land Use Type	Y_{UA} , tons/yr	Red_1	Red_2	Red_3	Red_4	Red_5	Y_{MA} , tons/yr
SF Residential	3.10E-03	0.00059	0.000	0.000	0.000	0.000	0.00
MF Residential	2.08E-02	0.00396	0.000	0.000	0.000	0.000	0.02
Food Store	0.00E+00	0.00000	0.000			0.000	0.00
Restaurant	0.00E+00	0.00000	0.000			0.000	0.00
Hospitals	0.00E+00	0.00000	0.000			0.000	0.00
Retail	1.56E-03	0.00008	0.000			0.000	0.00
Commercial	0.00E+00	0.00000	0.000			0.000	0.00
College/University	0.00E+00	0.00000	0.000			0.000	0.00
High school	0.00E+00	0.00000	0.000			0.000	0.00
Elementary School	0.00E+00	0.00000	0.000			0.000	0.00
Office	0.00E+00	0.00000	0.000			0.000	0.00
Hotel/Motel	0.00E+00	0.00000	0.000			0.000	0.00
Warehouse	0.00E+00	0.00000	0.000			0.000	0.00
Open Space	0.00E+00	0.00000	0.000			0.000	0.00
Total, tons/yr							0.02087
Reduction percentage, %							18.16

B. Indirect Sources

B1. Electricity

Emissions of nitrous oxide from electricity usage are calculated using the following equation:

$$Y_{MA} = (Y_{UA}) * (1 - Red)$$

Y_{MA} = mitigated annual emissions of nitrous oxide from electricity usage, tons/yr.

Y_{UA} = unmitigated annual emissions of nitrous oxide from electricity usage, tons/yr.

- Red1 = Title 24 reduction proportion, (URBEMIS 2007 9.2.2 output file). *Note if mitigated in Urbemis, do not add mitigation here for it.
- Red2 = Proposed residential buildings meet or exceeds the performance of an energy star labeled home (5% reduction) RESIDENTIAL ONLY
- Red3 = Residential buildings meet or exceed Energy Star rated light fixtures (?% reduction)
- Red4 = Residential buildings meet or exceed Energy Star rated appliances (?% reduction)
- Red5 = Installation and operation of renewable electric generation systems (?% reduction)
- Red6 = Installation and operation of energy efficient domestic hot water systems (5% reduction)
- Red7 = All lighting is fluorescent: Non-Residential Land Uses (?% reduction)
- Red8 = Reduction from use of solar panels

Land Use Type	Y_{UA} , tons/yr	Red ₁	Red ₂	Red ₃	Red ₄	Red ₅	Red ₆	Red ₇	Red ₈	Y_{MA} , tons/yr
Residential	0.04242	0.00806	0.002	0.000	0.000	0.000	0.000	0.000	0.000	0.03
Food Store	0.00000	0.00000				0.000	0.000	0.000	0.000	0.00
Restaurant	0.00000	0.00000				0.000	0.000	0.000	0.000	0.00
Hospitals	0.00000	0.00000				0.000	0.000	0.000	0.000	0.00
Retail	0.01009	0.00000				0.000	0.000	0.000	0.000	0.01
College/University	0.00000	0.00000				0.000	0.000	0.000	0.000	0.00
High school	0.00000	0.00000				0.000	0.000	0.000	0.000	0.00
Elementary School	0.00000	0.00000				0.000	0.000	0.000	0.000	0.00
Office	0.00000	0.00000				0.000	0.000	0.000	0.000	0.00
Hotel/Motel	0.00000	0.00000				0.000	0.000	0.000	0.000	0.00
Warehouse	0.00000	0.00000				0.000	0.000	0.000	0.000	0.00
Open Space	0.00000	0.00000				0.000	0.000	0.000	0.000	0.00
Total mitigated tons per year										0.04215
Reduction percentage, %										19.73

B2. Potable Water

Emissions of methane from potable water treatment and transportation for domestic use are calculated using the following equation:

$$Y_{MA} = (Y_{UA}) * (1 - (Red_1 + Red_2))$$

Y_{MA} = mitigated annual emissions of nitrous oxide from electricity used for potable water treatment and transportation, tons/yr.

Y_{UA} = unmitigated annual emissions of nitrous oxide from electricity used for potable water treatment and transportation, tons/yr.

- Red₁ = xeriscape landscaping reduction proportion, 0.35 (California Integrated Waste Management Board, Publication No. 442-96-033, 1996) for single family residential.
- Red₂ = low flush toilet reduction proportion, 0.03 (Riverside Public Utilities, Engineering Data).
- Red₃ = Incorporate water-efficient irrigation controls (?% reduction)
- Red₄ = Use reclaimed water for landscape irrigation (?% reduction)
- Red₅ = Includes measures to be water-efficient (water-efficient fixtures & appliances) (?% reduction)

Land Use Type	Y_{UA} , tons/yr	Red ₁	Red ₂	Red ₃	Red ₄	Red ₅	Y_{MA} , tons/yr
SF Residential	0.00054	0.00018	0.000	0.000	0.000	0.000	0.00
MF Residential	0.06744	0.02242	0.001	0.008	0.000	0.001	0.03
Food Store	0.00000	0.00000	0.000	0.000	0.000	0.000	0.00
Restaurant	0.00000	0.00000	0.000	0.000	0.000	0.000	0.00
Hospitals	0.00000	0.00000	0.000	0.000	0.000	0.000	0.00
Retail	0.70245	0.13768	0.009	0.062	0.000	0.008	0.48
Commercial	0.00000	0.00000	0.000	0.000	0.000	0.000	0.00
College/University	0.00000	0.00000	0.000	0.000	0.000	0.000	0.00
High school	0.00000	0.00000	0.000	0.000	0.000	0.000	0.00
Elementary School	0.00000	0.00000	0.000	0.000	0.000	0.000	0.00
Office	0.00000	0.00000	0.000	0.000	0.000	0.000	0.00
Hotel/Motel	0.00000	0.00000	0.000	0.000	0.000	0.000	0.00
Warehouse	0.00000	0.00000	0.000	0.000	0.000	0.000	0.00
Open Space	0.00000	0.00000	0.000	0.000	0.000	0.000	0.00
Total mitigated tons per year							0.5194952
Reduction percentage, %							32.57

* Red₂ = low flush toilet reduction proportion based on the ratio between the daily water saving of 22 gals per household and the daily water usage of 700 gals per household.

B3. Solid Waste

B3a. Exhaust Emissions (Hauling Trucks)

Emissions of nitrous oxide from solid waste transportation are not reduced by any mitigation measures; therefore, emissions of nitrous oxide from solid waste transportation equal to **0.002008954** tons/yr.

B3b. Exhaust Emissions (Disposal Equipment)

Emissions of nitrous oxide from solid waste disposal are not reduced by any mitigation measures; therefore, emissions of nitrous oxide from solid waste disposal equal to **0.93** tons/yr.

B4. Wastewater

Emissions of nitrous oxide from waste water treatment are calculated using the following equation:

$$Y_{MA1} = (Y_{MA2}) * (R_w)$$

Y_{MA1} = mitigated annual emissions of nitrous oxide from waste water treatment, tons/yr.

Y_{MA2} = mitigated annual emissions of nitrous oxide from electricity used for potable water treatment and transportation, tons/yr.

Red_1 = xeriscape landscaping reduction proportion, 0.35 (California Integrated Waste Management Board, Publication No. 442-96-033, 1996) for single family residential.

Red_2 = low flush toilet reduction proportion, 0.03 (Riverside Public Utilities, Engineering Data).

Red_3 = Includes measures to be water-efficient (water-efficient fixtures & appliances) (3% reduction)

Y_{UM1} tons/yr	Red_1	Red_2	Red_3	Y_{MA2} tons/yr
0.43	0.15	0.00	0.01	0.27
Reduction percentage, %				36.9689150

C. Summary Table

Source Type		Emissions, tons/yr	GWP tons/yr
Direct	Construction equipment	0.00	0.68
	Motor vehicles	9.91	3072.10
	Landscape equipment	7.40E-04	0.23
	Cooling and heating	2.09E-02	6.47
Total direct, tons/yr		9.93	
Indirect	Electricity	0.04	13.07
	Potable water	0.52	161.04
	Solid waste	0.93	288.38
	Wastewater	0.27	84.30
Total indirect, tons/yr		1.76	
Total, tons/yr		11.70	
Reduction percentage, %		20.13	
Global warming potential index		310	
Global warming potential, tons/yr		3,626.28	3626.28

