



# APPENDIX A

City of Vallejo Climate Action Plan

## Baseline Greenhouse Gas Emissions Inventory

**Vallejo 2008 Community-  
Wide Greenhouse Gas Emissions  
Inventory - Detailed Methodology**

APPENDIX A  
ATTACHMENT  
A

The purpose of this appendix is to provide transparency to the Inventory, outline data limitations, and provide guidance for future City inventories to maintain methodological consistency. Emission factors (also referred to as emission coefficients) and activity level data, typically framed as the amount of energy consumed or waste generated, are needed to calculate emissions resulting from that activity. Emission factors describe the quantity of a pollutant emitted for every unit of activity.

$$\text{Activity Level Data} \times \text{Emissions Factor} = \text{Emissions Generated from Activity}$$

The following is a detailed explanation of data sources and methodology for calculating activity level data and emissions factors, and thus greenhouse gas (GHG) emissions, per sector.

## ELECTRICITY AND NATURAL GAS

### Activity Level Data

John Joseph of Pacific Gas and Electric Company (PG&E) provided electricity and natural gas consumption on September 16, 2010. PG&E is the energy provider for all properties within Vallejo, except for Mare Island, for which energy is provided by Island Energy. Electricity and natural gas data for properties on Mare Island were provided by Linda Anderson of Island Energy on October 19, 2010.

The raw data received from PG&E and Island Energy is summarized in **Table 1** below. This raw data, kilowatt-hours (kWh) and therms, was multiplied by electricity and natural gas coefficients.

**Table 1: Residential and Commercial Energy Use**

2008 Energy Emissions	Source	Quantity	Unit	Output Metric Tons CO <sub>2</sub> e per Year
Residential	Electricity	239,663,806	kWh	70,090
	Natural Gas	17,733,203	Therms	95,400
Commercial/ Industrial	Electricity	187,560,174	kWh	54,850
	Natural Gas	5,873,605	Therms	31,600
Island Energy	Electricity	17,922,946	kWh	7,830
	Natural	4,261,832	Therms	22,930

**Vallejo 2008 Community-  
Wide Greenhouse Gas Emissions  
Inventory - Detailed Methodology**

	Gas			
--	-----	--	--	--

Commercial and industrial electricity are combined by PG&E due to the California 15/15 Rule. The California Public Utilities Commission (CPUC) adopted the 15/15 Rule in the Direct Access Proceeding (CPUC Decision 97-10-031) to protect customer confidentiality. The 15/15 Rule requires that any aggregated information provided by the utilities must include of at least 15 customers and that a single customer's load must be less than 15% of an assigned category. If the number of customers in the complied data is below 15, or if a single customer's load is more than 15% of the total data, categories must be combined before the information is released. The rule further requires that if the 15/15 Rule is triggered for a second time after the data has been screened already using the 15/15 Rule, the customer must be dropped from the information provided.

**Electricity and Natural Gas Coefficients**

PG&E provided a carbon dioxide equivalent (CO<sub>2</sub>e) coefficient for electricity and a carbon dioxide (CO<sub>2</sub>) coefficient for natural gas. Emissions coefficients for methane (CH<sub>4</sub>) and nitrogen dioxide (N<sub>2</sub>O) emissions were provided by the California Air Resources Board's (CARB) Local Government Operations Protocol (LGOP) v1.1 and were converted into carbon dioxide equivalents and added to the CO<sub>2</sub> coefficient to create a CO<sub>2</sub>e coefficient. Island Energy electricity and natural gas data is provided by the Pittsburg Power Company and utilizes California grid averages for both electricity and natural gas. Sources and coefficient values are summarized in **Table 2** below.

**Table 2: Emission Coefficients**

Coefficient Set	GHG	Emission Factor	Source
PG&E Electricity	CO <sub>2</sub>	0.489155 lbs/kWh	The "PG&E California" electricity coefficient set is based on the 2008 PG&E CO <sub>2</sub> emission factor of 0.492859 lbs/kWh of delivered electricity. This emissions factor is certified by the California Climate Action Registry and was reported to ICLEI in January 2007 by Greg San Martin. Criteria air pollutant emission factors for electricity are derived from the NERC Region 13 - Western Systems Coordinating Council/CNV Average Grid Electricity Set.
	CO <sub>2</sub> e	0.492859 lbs/kWh	

**Vallejo 2008 Community-  
Wide Greenhouse Gas Emissions  
Inventory - Detailed Methodology**

APPENDIX A  
ATTACHMENT  
A

Coefficient Set	GHG	Emission Factor	Source
PG&E and Island Energy Natural Gas	CO <sub>2</sub>	53.050 kg/MMBtu	The "California Coefficients for Natural Gas" coefficient set is based on a CO <sub>2</sub> emissions factor of 53.05 kg/MMBtu of delivered natural gas, certified by the California Climate Action Registry and the California Energy Commission. Criteria air pollutant emissions factors for natural gas are derived from the California Air Resources Board's Local Government Operations Protocol, version 1.1.
	CH <sub>4</sub>	0.0059 kg/MMBtu	
	N <sub>2</sub> O	0.001 kg/MMBtu	
Island Energy Electricity	CO <sub>2</sub> e	0.000437	The Island Energy power content matches that of California, and therefore Island Energy utilizes the California grid average electricity coefficient.

## TRANSPORTATION

### Activity Level Data

Community on-road vehicle miles traveled (VMT) are miles traveled on locally maintained roads within the City of Vallejo. State roads, highways, and interstate routes are not included in this data. Local road VMT in 2008 data was obtained from Caltrans Highway Performance Maintenance System (HPMS).

Highway VMT are miles traveled on state highways in Solano County that are attributed to the City of Vallejo. This includes both trips originating and ending in Vallejo, as well as pass-through traffic. The analysis of highway transportation assumes constant levels of travel along all highways within Solano County. Highway VMT was attributed to the City of Vallejo by determining the proportion of local road traffic in the city compared to the rest of the county. Local and highway VMT is shown in **Table 3**.



## Vallejo 2008 Community- Wide Greenhouse Gas Emissions Inventory - Detailed Methodology

**Table 3: Vallejo Vehicle Miles Traveled Data (VMT), 2008**

Road Type	Quantity	Unit	MTCO <sub>2</sub> e
Internal-Internal	144,954,045	Annual VMT	68,370
External-Internal	237,925,408	Annual VMT	83,280
Internal-External	244,197,086	Annual VMT	85,470
Commercial Vehicles	25,323,366	Annual VMT	40,600
<b>TOTAL</b>	<b>652,399,905</b>	<b>Annual VMT</b>	<b>277,720</b>

### Transportation Coefficients

In order to provide an accurate assessment of the emissions within the city, county-specific emissions data is provided from the California Air Resources Board Emissions Factors (EMFAC) software. The EMFAC2007 model calculates emission rates from all motor vehicles, such as passenger cars and heavy-duty trucks, operating on highways, freeways, and local roads in California. Emissions rates provided by EMFAC are multiplied by activity data by vehicle class based on the local road and highway VMT for the City of Vallejo. Emissions factors are shown in **Table 4**.

**Table 4: Transportation Emissions Coefficients**

Fuel Type	CO <sub>2</sub> Emissions Factor	CH <sub>4</sub> Emissions Factor	N <sub>2</sub> O Emissions Factor
Gasoline	8.63 grams/gallon	0.061 grams/mile	0.070 grams/mile
Diesel	9.994 grams/gallon	0.022 grams/mile	0.050 grams/mile

## WATER

### Activity Level Data

Vallejo's water is provided by the City from local reservoirs and the State Water Project. The Vallejo Sanitation and Flood Control District collects and treats the wastewater and stormwater from Vallejo before discharging the water into the San Francisco Bay. **Table 5**

**Vallejo 2008 Community-  
Wide Greenhouse Gas Emissions  
Inventory - Detailed Methodology**

APPENDIX A  
ATTACHMENT  
A

presents the total amount of water used by each sector as provided by the City of Vallejo's Water Utility Financing Plan and Rate Study.<sup>1</sup>

**Table 5: Vallejo Water Use, 2008**

Sector	Water Use (MG)
Residential	3,804
Commercial	781
Government/Institutional	769
Raw Water	167
<b>Total</b>	<b>5,522</b>

*MG = million gallons*

### Emissions Coefficients

Water-related emissions include the electricity use required to supply, convey, treat, distribute, collect, and dispose of water used by residences, businesses, and institutions in the City of Vallejo. The emissions coefficients in **Table 6** use California averages provided by the California Energy Commission to determine the number of kilowatt-hours used per million gallons (MG) of water used.<sup>2</sup>

<sup>1</sup> Bay Area Water Supply and Conservation Agency (January 2010). Annual Survey and Water Conservation Report. Retrieved from [http://bawasca.org/docs/BAWSCA\\_Survey\\_08\\_09\\_FINAL\\_rev\\_5\\_3.pdf](http://bawasca.org/docs/BAWSCA_Survey_08_09_FINAL_rev_5_3.pdf) on September 1, 2010.

<sup>2</sup> California Energy Commission. (November 2005). California's Water-Energy Relationship. Retrieved from <http://www.energy.ca.gov/2005publications/CEC-700-2005-011/CEC-700-2005-011-SF.PDF> on September 2, 2010.

**Vallejo 2008 Community-  
Wide Greenhouse Gas Emissions  
Inventory - Detailed Methodology**

**Table 6: Water Emissions Coefficients, 2008**

Water Process	Source	kWh/MG
Supply	Surface Water	0
Conveyance	State Water Project	3,150
	Local Water Supply	120
Treatment	EPRI Average	100
Distribution	EPRI Average	1,200
Wastewater Collection	Aggregated within Treatment	--
Wastewater Treatment	Advanced Treatment	1,322
Wastewater Disposal	Gravity Discharge	0

## WASTE

### Activity Level Data

The waste sector only takes into account the waste sent to landfills from city residents, businesses, and institutions in 2008. Waste emissions are considered Scope 3 emissions because they are not generated in the base year, but will result from the decomposition of waste generated in 2005 over the full 100-year cycle of its decomposition. **Table 7** presents Vallejo's community waste tonnage, alternative daily cover (ADC) tonnage, and ADC waste share provided by the CalRecycle Disposal Reporting System.<sup>3</sup>

Since the composition of waste sent to landfill in 2008 is unknown for the city, a statewide average waste composition study was utilized.<sup>4</sup>

<sup>3</sup> CalRecycle. Local Government Central Disposal Reporting System. <http://www.calrecycle.ca.gov/lgcentral/drs/>.

<sup>4</sup> CalRecycle (2004). Statewide Waste Characterization Study, <http://www.ciwmb.ca.gov/Publications/default.asp?pubid=1097>.

**Vallejo 2008 Community-  
Wide Greenhouse Gas Emissions  
Inventory - Detailed Methodology**

APPENDIX A  
ATTACHMENT  
A

**Table 7: Vallejo Waste Tonnages, 2008**

Waste Type		Tons Landfilled	Source
Municipal Solid Waste	All Waste	77,590	CalRecycle DRS
Alternative Daily Cover	Compost or Green Waste	3,048	CalRecycle DRS

LGOP provides default methane capture rates of 75%. Methane emissions generated over the 100-year cycle from the city's waste was calculated using EPA's WARM Model.<sup>5</sup> Due to lack of local data, Vallejo's waste composition is based on California statewide waste composition in 2005 as shown in **Table 8**.

**Table 8: Waste Composition, 2008**

Waste Type	Description	Waste Share (State Average)
Paper Products	All paper types	21.0%
Food Waste	Food	14.6%
Plant Debris	Leaves and Grass, Prunings and Trimmings, Branches and Stumps, Agricultural Crop Residues, and Manures	6.9%
Wood/Textiles	Textiles, Remainder/Composite Organics, Lumber, and Bulky Items	21.8%
All Other Waste	Inorganic Material such as Glass, Metal, Electronics, Plastics, Non-organic C&D, and Hazardous Waste	35.8%
ADC Plant Debris	Organic Portion of ADC (cover material placed on top of landfills at the end of each operating day to control vectors, fires, odors, blowing litter, and scavenging)	N/A

<sup>5</sup> EPA Waste Reduction Model (WARM) at [www.epa.gov/warm](http://www.epa.gov/warm)

**Vallejo 2008 Community-  
Wide Greenhouse Gas Emissions  
Inventory - Detailed Methodology**

**OFF-ROAD EQUIPMENT**

**Activity Level Data**

The Inventory includes emissions from lawn and garden as well as construction equipment source. While there are several other off-road equipment uses with emissions in Solano County, currently there is no reasonable methodology to attribute marine, recreational, airport, or other equipment and vehicles to each individual jurisdiction within the county. Emissions from construction and lawn and garden equipment for Solano County were determined using CARB's OFFROAD 2007 program and are presented in Table 9. Per BAAQMD Guidance, county-level emissions for off-road equipment were attributed to Vallejo using the following indicators:

- Totally county construction equipment emissions were attributed to Vallejo using the proportion of new housing units (see Table 10) built within Vallejo compared to the entire county using HUD's State of the Cities Data Systems building permit reporting system.
- Total county lawn and garden emissions were attributed to Vallejo using the proportion of existing households within Vallejo compared to the entire county using ABAG housing projection figures and are presented in Table 11.

**Table 9: Solano County 2008 Off-Road Emissions**

Equipment Type	Emissions (MTCO <sub>2</sub> e)
Construction	65,300
Lawn & Garden	3,850

**Table 10: Vallejo and Solano County New Housing Units, 2008**

Jurisdiction	Housing Units Built
Vallejo	13
Solano County	565
Percentage of new housing in Vallejo	2.30%

**Vallejo 2008 Community-  
Wide Greenhouse Gas Emissions  
Inventory - Detailed Methodology**

APPENDIX A  
ATTACHMENT  
A

**Table 11: Vallejo and Solano County Households, 2008**

Jurisdiction	Households
Vallejo	41,640
Solano County	143,290
Percentage of households in Vallejo	29.06%

## STATIONARY SOURCES

Stationary sources are included in the Inventory as an information item. In January 2011, the BAAQMD responded to a data request by the City of Vallejo for stationary or point source emitters within the jurisdictional boundary of Vallejo. Stationary sources are defined as any fixed emitter of air pollutants, such as power plants, petroleum refineries, petrochemical plants, food processing plants, and other heavy industrial sources. BAAQMD provided a list of stationary source emissions within the City of Vallejo totaling 9,630 MTCO<sub>2</sub> in 2008.

## 2020 BUSINESS-AS-USUAL FORECAST

The business-as-usual (BAU) scenario utilizes the Association of Bay Area Governments' (ABAG) Projections (2009) data for 2020, 2030, and 2035 population, jobs, and household growth. Vehicle miles traveled in 2020, 2030, and 2035 were modeled based on the Metropolitan Transportation Commission's (MTC) County Specific Growth Estimates. These growth indicators and their sources are summarized in **Table 12**.



**Vallejo 2008 Community-  
Wide Greenhouse Gas Emissions  
Inventory - Detailed Methodology**

**Table 12: 2020 Growth Indicators**

Growth Indicator	Source	2008	2020	2030	2035	Applied to...
Population	ABAG	120,466	130,900	136,400	143,900	–
Service Population	ABAG	153,548	168,690	179,380	189,820	Waste Water
Households	ABAG	41,640	44,480	46,690	47,940	Residential Energy
Annual VMT	MTC	684,827,693	790,218,993	830,410,692	881,638,252	Transportation
Employment	ABAG	33,082	37,790	42,980	45,920	Commercial & Industrial Energy

Emissions growth per sector is shown in Table 13.

**Table 13: 2020 BAU Growth Forecast**

	2008	2020	Percentage Increase
Residential	172,310	184,060	7%
Commercial/Industrial	110,390	126,100	14%
Transportation	277,720	297,790	7%
Waste	14,640	16,080	10%
Water	6,570	7,220	10%
Off-Road	6,410	19,080	198%
Total	588,040	650,330	246%

## FORECAST ADJUSTMENT

The BAU forecast was adjusted to include three mandated efficiency measures being implemented at the state and federal levels. Their incorporation into the growth forecast is recommended by the Bay Area Air Quality Management District (BAAQMD) in their plan-level GHG quantification guidance. These state and federal reductions, when applied to Vallejo's emissions forecast, result in a net decrease in emissions as shown in Table 11 below.

**Vallejo 2008 Community-  
Wide Greenhouse Gas Emissions  
Inventory - Detailed Methodology**

APPENDIX A  
ATTACHMENT  
A

**Assembly Bill (AB) 1492 (Pavley).** California's Pavley regulations were established by AB 1493 in 2002. They require new passenger vehicles to reduce tailpipe GHG emissions from 2009 to 2020. Reductions from the Pavley regulations were calculated using the methodology included in an EMFAC2007 post-processing tool provided by CARB and supported by BAAQMD.<sup>6</sup> Emissions reductions per model year and vehicle class were applied to Vallejo's transportation emissions.

California's Renewable Portfolio Standard (RPS) mandates that utility providers procure 33% of their energy from renewable sources by 2020. It has become clear to the California Public Utilities Commission (CPUC) that energy providers are not likely to meet this target; therefore the calculation included in this report relies on a more realistic scenario modeled by the CPUC in their June 2009 RPS Implementation Analysis Report.<sup>7</sup> The report indicates that a more realistic estimate of renewable energy in 2020 is 26% by 2020 and 33% by 2030.

**California Green Building Standards Code (CalGreen).** The 2008 Title 24 update went into effect on January 1, 2010. The energy reductions quantified in the forecast are the mandatory improvements over the 2005 Title 24 code that were established by the 2010 update. These are statewide standards applied at the local level by city agencies through project review. The CalGreen standards that go into effect January 1, 2011, do not provide additional mandatory reductions in energy consumption that can be quantified as an anticipated alteration to business-as-usual trends..

The calculation of CalGreen energy reductions assumes that all development between 2010 and 2025 will meet Title 24 2008 minimum efficiency standards. It also assumes that all growth in natural gas and electricity sectors is from new construction. The 2008 Title 24 Energy Efficiency Improvements in comparison to 2008 baseline Title efficiency standards are provided by the California Energy Commission (CEC).<sup>8</sup>

---

<sup>6</sup> CARB (2010). Pavley I and Low Carbon Fuel Standard Postprocessor Version 1.0.  
<http://www.arb.ca.gov/cc/sb375/tools/postprocessor.htm>.

<sup>7</sup> CPUC (2009). 33% Renewable Portfolios Standard Implementation Analysis Report.  
<http://www.cpuc.ca.gov/NR/rdonlyres/1865C207-FEB5-43CF-99EB-A212B78467F6/0/33PercentRPSImplementationAnalysisInterimReport.pdf>.

<sup>8</sup> California Energy Commission, Impact Analysis: 2008 Update to the California Energy Efficiency Standards for Residential and Nonresidential Buildings, November 2007.

**Vallejo 2008 Community-  
Wide Greenhouse Gas Emissions  
Inventory - Detailed Methodology**

**Table 14: 2010, 2020, 2035 Forecast Emissions and State Reductions**

	2010 (MTCO <sub>2</sub> e/yr)	2020 (MTCO <sub>2</sub> e/yr)	2035 (MTCO <sub>2</sub> e/yr)
<b>Business-as-Usual Projection</b>	<b>595,600</b>	<b>650,340</b>	<b>728,170</b>
Renewable Portfolio Standard (RPS)	-7,770	-23,510	-38,370
Title 24 Energy Efficiency Standards	0	-8,250	-26,310
AB 1493 (Pavley)	0	-47,200	-78,340
California Solar Initiative	-520	-520	-520
<i>Subtotal State Reductions</i>	<i>-8,290</i>	<i>-79,480</i>	<i>-143,540</i>
<b>Emissions Forecast</b>	<b>587,310</b>	<b>570,860</b>	<b>584,630</b>



# APPENDIX B

City of Vallejo Climate Action Plan

## Compliance with BAAQMD CEQA Guidelines

The detailed methodology for government operations is much less complex than the community-wide methodology explanation. The government operations GHG emissions inventory is a facility-scale study so data records are more reliable and consistent than community-wide information. The Local Government Operations Protocol (LGOP) also provides us a verified guide for calculating emissions in each sector.

## FACILITIES

The building sector includes all emissions from natural gas and electricity consumed in City-owned and -operated facilities, as well as facilities associated with the Vallejo Sanitation and Flood Control District (VSFCD). PG&E electricity and natural gas usage for City of Vallejo facilities was provided by John Joseph, PG&E (ghgdatarequests@pge.com). Island Energy electricity and natural gas usage for City facilities on Mare Island was provided by Linda Anderson, Administrative Assistant, Pittsburg Power (landerson@ci.pittsburg.ca.us; 707-562-5000). Electricity, natural gas, and stationary diesel use for facilities associated with VSFCD were provided by Rolf Ohlemutz, VSFCD (rohlemutz@vsfcd.com; 707-644-8949). Facility activity data is summarized in Table 1.

**Table 1: 2008 Facility Activity Data**

Agency	Energy Supplier	Activity Type	Activity Data
City of Vallejo	PG&E	Electricity (kWh)	5,328,000
	PG&E	Natural Gas (Therms)	73,256
	Island Energy	Electricity (kWh)	4,285,230
	Island Energy	Natural Gas (Therms)	62,139
VSFCD	PG&E	Electricity (kWh)	8,299,410
	PG&E	Natural Gas (Therms)	670,085
	---	Stationary Diesel (Gal)	3,200

The kilowatt-hours (kWh) of electricity, therms of natural gas, and gallons of stationary diesel were then multiplied by their respective emissions factors (see Table 2) and converted to CO<sub>2</sub>e.

Detailed Methodology for Government Operations GHG Emissions Inventory

Table 2: Energy Coefficients

Source	Activity Type	Emissions Coefficient (MTCO <sub>2e</sub> per unit of activity)
PG&E	Electricity	0.00022356
	Natural Gas	0.00530709
Island Energy	Electricity	0.00043700
	Natural Gas	0.00530709
LGOP V1.1	Stationary Diesel	0.01024850

## VEHICLE AND EQUIPMENT FLEET

The vehicle fleet sector includes gasoline and diesel use from vehicles and equipment for all City departments, including the transit and ferry fleets. Gasoline and diesel consumption, as well as vehicle miles traveled (VMT) for each vehicle in 2008, was obtained from fuel usage reports provided by Mark Fowler, Equipment Supervisor (mfowler@ci.vallejo.ca.us; 707-646-4334). Vehicle fleet consumption information is summarized in Table 3.

Table 3: Vehicle Fleet Summary

Fuel Type	Vehicle Type	Number of Vehicles	Fuel Consumed	VMT
Diesel	Light-Duty Truck	17	7,096	37,501
	Heavy-Duty Vehicle	24	19,082	44,830
	Transit Fleet	60	481,386	2,046,678
	Ferry Fleet	4	1,415,040	216,126
	Equipment	21	4,099	n/a
Gasoline	Passenger Vehicle	92	76,917	828,517
	Light-Duty Truck	139	62,258	724,754
	Heavy-Duty Vehicle	1	27	–
	Para-Transit Vans	12	22,979	146,694
	Equipment	8	509	n/a



# Detailed Methodology for Government Operations GHG Emissions Inventory

APPENDIX A  
ATTACHMENT  
B

Emission factors for each vehicle were determined using VMT, fuel consumption data, and vehicle model year data. Emissions coefficients for each vehicle and equipment type are found in the Local Government Operations Protocol Version 1.1 and summarized in **Table 4**.

**Table 4: Vehicle Fleet Coefficients**

Fuel Type	Vehicle Type	Model Year	CO <sub>2</sub> (MT/gal)	N <sub>2</sub> O (MTCO <sub>2</sub> e/mile) <sup>1</sup>	CH <sub>4</sub> (MTCO <sub>2</sub> e/mile) <sup>2</sup>
Diesel	Light-Duty Truck	All Model Years	0.01021	0.000000310	0.000000032
	Heavy-Duty Vehicle	All Model Years	0.01021	0.000001488	0.000000107
	Transit Fleet	All Model Years	0.01021	0.000001488	0.000000021
	Ferry Fleet	All Model Years	0.01021	0.000080600	0.00001554
	Equipment	All Model Years	0.01021	0.000080600	0.00001218
Gasoline	Passenger Vehicle	1996	0.00878	0.000013206	0.00000057
		1999	0.00878	0.000010447	0.00000045
		2000	0.00878	0.000008463	0.00000037
		2001	0.00878	0.000004898	0.00000023
		2002	0.00878	0.000004743	0.00000022
		2003	0.00878	0.000004185	0.00000024
		2004	0.00878	0.000002573	0.00000030
		2005	0.00878	0.000002449	0.00000031
		2006	0.00878	0.000001767	0.00000034
		2007	0.00878	0.000001271	0.00000036
		2008	0.00878	0.000001178	0.00000036
	Light-Duty Truck	1988–1993	0.00878	0.000032085	0.00000171
		1994	0.00878	0.000030442	0.00000136
		1995	0.00878	0.000028148	0.00000109
		1996–1997	0.00878	0.000027001	0.00000095

<sup>1</sup> N<sub>2</sub>O emissions for equipment is in MTCO<sub>2</sub>e/gallon

<sup>2</sup> CH<sub>4</sub> emissions for equipment is in MTCO<sub>2</sub>e/gallon

Detailed Methodology for Government Operations GHG Emissions  
Inventory

Fuel Type	Vehicle Type	Model Year	CO <sub>2</sub> (MT/gal)	N <sub>2</sub> O (MTCO <sub>2</sub> e/mile) <sup>1</sup>	CH <sub>4</sub> (MTCO <sub>2</sub> e/mile) <sup>2</sup>
		1998	0.00878	0.000022568	0.00000082
		1999	0.00878	0.000017484	0.00000067
		2000	0.00878	0.000019251	0.00000073
		2001	0.00878	0.000005084	0.00000032
		2002	0.00878	0.000007068	0.00000037
		2003	0.00878	0.000004464	0.00000033
		2004	0.00878	0.000004092	0.00000032
		2006	0.00878	0.000002759	0.00000033
		2007	0.00878	0.000002449	0.00000034
		2008	0.00878	0.000002046	0.00000034
	Heavy-Duty Vehicle	1990	0.00878	0.000035402	0.00000682
	Para-Transit Vans	All Model Years	0.00878	0.00003844	3.255E-07
	Equipment	All Model Years	0.00878	0.0000682	0.0000105

## EMPLOYEE COMMUTE

Employees were surveyed in October 2010 using an online survey instrument. The questions, attached as **Appendix C**, asked employees about their current commuting patterns. Of those questions, we used the following for our analysis:

- What is your approximate one-way distance to work (in miles)? Please indicate the most direct distance to work, discounting midway destinations that would be taken whether or not you drove to work each day (i.e., dropping off children at school).
- Please indicate the type of transportation you take to work each day in your average two-week work period. Respondents were asked to provide daily commute behavior for a period of two weeks to account for alternative work schedules (9/80, 4/10) and police/fire non-traditional work weeks.
  - Drive alone
  - Carpool with fellow City employees
  - Carpool with drivers not employed by the City
  - Vanpool

- Public transit
  - Motorcycle
  - Bicycle
  - Walk
  - Telecommute
  - Other
- What type of vehicle do you drive?
  - What type of fuel does your vehicle use?
  - If you carpool with fellow City employees, how many City employees ride with you? If you carpool with a different number each day, please indicate the average.

Approximately 153 employees responded to the survey with usable information, meaning that all essential questions were answered. Answers with mileage left blank or with highly inconsistent data were omitted. In addition, if a respondent did not describe their "other" category of transportation, the entry was omitted.

To perform this analysis, entries were separated by what type of vehicle they own and operate (compact, mid-size car, full-size car, small truck, medium-small truck, large truck, motorcycle, or "don't drive"). Within each new group, entries were separated by diesel or gasoline fuel. For each group of entries with the same vehicle type and technology, round-trip mileage per year was calculated. To convert vehicle miles traveled into emissions, the average fuel economy for each vehicle class and fuel class, as provided by LGOP v 1.1 (see **Table 6**), was used to convert CO<sub>2</sub> emissions from kilograms per gallon to grams per mile. Hybrid vehicles were separated from gasoline-fueled vehicles to account for their higher average fuel efficiency.

In 2008, there were a total of 555 employees. For each employee, workday mileage for two weeks was multiplied by an average of 26.09 for a total of 52.18 work weeks/year. The 2008 sample results, adjusted for the 2008 employee population, are shown in **Table 5**.

Detailed Methodology for Government Operations GHG Emissions Inventory

Table 5: 2010 Employee Commute Survey

Vehicle Group	Fuel Type	2010 Sample Annual VMT	Adjusted 2008 Annual VMT for Employee Population	2008 Employee Commute Emissions (MTCO <sub>2</sub> e)	Adjusted 2008 Annual VMT for VSFCD Employee Commute	2008 VSFCD Employee Commute Emissions
Passenger Vehicle	Gasoline	577,239	2,093,906	800	335,780	128
	Diesel	11,700	42,441	10	6,806	2
	Hybrid	13,104	47,534	11	7,623	2
Small Truck/SUV/Pickup	Gasoline	135,699	492,241	230	78,936	37
Medium-Small Truck/SUV/Pickup	Gasoline	91,733	332,758	156	53,361	25
Large Truck/SUV/Pickup	Gasoline	86,102	312,329	199	50,085	32
	Diesel	22,360	81,110	28	13,007	4
	Hybrid	13,000	47,157	22	7,562	4
Motorcycle	Gasoline	19,760	71,678	16	11,494	3
TOTAL		970,697	3,521,154	1,470	564,650	240

**Table 6: Vehicle Emissions Coefficients**

Vehicle Class	Fuel Type	Avg Fuel Efficiency (mpg)	CO <sub>2</sub> (g/mi)	CH <sub>4</sub> (g/mi)	N <sub>2</sub> O (g/mi)
Passenger Car	Gas	23.6	372	0.0254	0.0300
	Diesel	27.4	210	0.0550	0.0670
	Hybrid <sup>3</sup>	39.1	224	0.0254	0.0300
Light-Duty Vehicle - 1	Gas	19.5	450	0.0349	0.0529
Light-Duty Vehicle - 2	Gas	19.5	450	0.0349	0.0529
Medium-Duty Vehicle	Gas	14.6	602	0.1401	0.1029
	Diesel	30.0	340	0.0051	0.0048
	Hybrid <sup>4</sup>	20.0	439	0.1401	0.1029
Motorcycle	Gas	40.7	216	0.0254	0.0300

## STREETLIGHTS

PG&E provided billing information for the electricity used to operate City streetlights and traffic signals. Electricity use data for streetlights on Mare Island was provided by Island Energy.<sup>5</sup> The total kWh used for streetlights in 2008 (see Table 7) was multiplied by the emissions coefficients for PG&E and Island Energy as provided in Table 2.

<sup>3</sup> Fuel economy for hybrid vehicles was determined by taking the average fuel economy of all hybrid passenger vehicles available in 2008 as reported by [www.fueleconomy.gov](http://www.fueleconomy.gov).

<sup>4</sup> Fuel economy for hybrid vehicles was determined by taking the average fuel economy of all hybrid medium duty vehicles available in 2008 as reported by [www.fueleconomy.gov](http://www.fueleconomy.gov).

<sup>5</sup> For PG&E and Island Energy data source, see "Facilities" section.

Detailed Methodology for Government Operations GHG Emissions Inventory

**Table 7: Streetlights and Traffic Signal Electricity Use**

Activity	Electricity Provider	Activity Data (kWh)
Traffic Signals	PG&E	496,572
	Island Energy	-
Streetlights	PG&E	4,795,772
	Island Energy	198,216

## WATER

This sector calculates emissions from energy consumption at City-owned and -operated reservoirs, water storage tanks, water pumps, and lifts, as well as City-owned irrigation controllers. It does not calculate the total emissions from all water used or treated for the community. Doing so would be including emissions that are accounted for in another jurisdiction, which would cause double-counting.

PG&E and Island Energy provided the electricity consumption for each water facility or equipment as shown in **Table 8**.<sup>6</sup> The total kWh used in 2008 was multiplied by the emissions coefficients for PG&E and Island Energy as provided in **Table 2**.

**Table 8: Water Equipment Electricity Use**

Activity	Electricity Provider	Activity Data (kWh)
Irrigation	PG&E	70,232
Pump Stations	PG&E	6,818,179
Reservoirs	PG&E	10,728,909
Water Storage Tanks	PG&E	23,951
	Island Energy	239,226
Total		17,641,271

<sup>6</sup> For PG&E and Island Energy data source, see "Facilities" section.



## WASTEWATER

The Vallejo Sanitation and Flood Control District is responsible for the collection, treatment, and discharge of Vallejo's water. Nitrous oxide emissions from wastewater treatment processes are calculated using a publically-available tool provided by ICLEI – Local Governments for Sustainability to calculate wastewater treatment process and fugitive emissions. The tool is based on the type of system utilized and the population served by VSFCD. VSFCD operates an trickling filter solids contact system to treat water effluent, which releases nitrous oxide emissions similar to the process of an anaerobic digester. In 2008, VSFCD served approximately 116,000 people. Information regarding wastewater treatment operations and the population served by VSFCD was provided by Rolf Ohelmutz and Huberto Molina with VSFCD (rohelmutz@vsfcd.com).

## WASTE

Recology Vallejo provides waste services to the City of Vallejo and VSFCD. The City produced 10,692 cubic yards of waste in 2008 that was sent to managed landfills, while VSFCD produced 782 cubic yards. The total cubic yards of waste was converted to tons by using a standard volume to weight conversion rate of 225 pounds/cubic yard provided by CalRecycle's Diversion Study Guide, Appendix I.<sup>7</sup> Activity data and its conversion to tons are shown in **Table 9**.

Like many jurisdictions, the City does not know the composition of its waste stream; therefore, the California averages provided by the 2004 California Integrated Waste Management Board Waste Characterization Report were used. Calculating emissions from municipal waste sent to landfills follows the same process of using EPA's WARM Model to determine the methane emissions from municipal waste over a 100- year life-cycle as summarized in **Appendix A**.

**Table 9: Waste Activity Data**

	Bin Type	Cubic Yards Per year	Weight (Tons)
City of Vallejo	Cans	2,892	325
	Yard Bins	7,800	878
VSFCD	Yard Bins	782	88

<sup>7</sup> CalRecycle, Diversion Study Guide Appendix I - Conversion Factor Sources, September 2009, <http://www.calrecycle.ca.gov/LGCentral/Library/dsg/Apndxl.htm>.

## REFRIGERANTS

Refrigerants are used in air conditioning equipment for both buildings and vehicles. Converting refrigerant emissions to carbon dioxide equivalents requires multiplying the metric tons of refrigerant used by the chemical's global warming potential. In 2008, the City of Vallejo used 40 pounds of HFC-134a refrigerant for the City's vehicle fleet, which has a global warming potential of 1,300. VSFCD used 48 pounds of R-22 for building HVAC systems, which has a global warming potential of 1,700. The global warming potential of common refrigerants and refrigerant blends are provided in Appendix G of LGOP v1.1.

## **BAY AREA AIR QUALITY MANAGEMENT DISTRICT CEQA GUIDELINES**

The City of Vallejo developed this Climate Action Plan to meet the requirements of the Bay Area Air Quality Management District's (BAAQMD) criteria for a qualified greenhouse gas reduction strategy as defined in BAAQMD's California Environmental Quality Act (CEQA) Air Quality Guidelines. The CEQA Air Quality Guidelines were updated in 2010 in response to the State of California's amendment to the State CEQA Guidelines through Senate Bill 97 (SB 97). SB 97 requires all projects subject to CEQA to analyze and mitigate the greenhouse gas emissions that will occur.

The purpose of the BAAQMD CEQA Air Quality Guidelines is to assist lead agencies in evaluating the air quality impacts of proposed projects and plans within the San Francisco Bay Area Air Basin. The guidelines were updated to establish thresholds of significance for impacts related to greenhouse gas (GHG) emissions to be consistent with the requirements of the California Environmental Quality Act. These thresholds can be used to assess plan-level and project-level impacts and allow a lead agency to determine that a project's impact on GHG emissions is less than significant if it is in compliance with a qualified greenhouse gas reduction strategy.

The City's Climate Action Plan follows both the State CEQA Guidelines and BAAQMD's guidelines by incorporating the standard elements of a qualified GHG reduction strategy into the CAP. The standard elements of a GHG reduction strategy include the following steps:

- Quantify greenhouse gas emissions, both existing and projected over a specified time period, resulting from activities within a defined geographic range.
- Establish a level, based on substantial evidence below which the contribution to greenhouse gas emissions from activities covered by the plan would not be cumulatively considerable.
- Identify and analyze the greenhouse gas emissions resulting from specific actions or categories of actions anticipated within the geographic area.
- Specify measures or a group of measures, including performance standards that substantial evidence demonstrates, if implemented on a project-by-project basis, would collectively achieve the specified emissions level.
- Monitor the plan's progress.

# BAAQMD Compliance

- Adopt the greenhouse gas reduction strategy in a public process following environmental review.

The remainder of this appendix describes in detail how the City's Climate Action Plan has been developed to satisfy the requirements of BAAQMD's guidelines on the standard elements of a qualified GHG reduction strategy and will allow future development projects to determine that a project has a less than significant impact on GHG emissions so long as it is in compliance with the City's CAP.

## GHG Emissions Inventory

The first component of a qualified GHG reduction strategy is to conduct an inventory of GHG emissions within a specified geographic boundary. The City of Vallejo's GHG inventory utilizes a baseline year of 2008 to inventory carbon dioxide (CO<sub>2</sub>), nitrous oxide (N<sub>2</sub>O), and methane (CH<sub>4</sub>) generated from activities by the Vallejo community.

The emissions sources calculated in the baseline GHG inventory include commercial, residential, and industrial electricity and natural gas use, on-road transportation, solid waste disposal, energy use related to water and wastewater, and off-road equipment use for construction and lawn and garden activities. GHG emissions from these activities were calculated from activity data such as kilowatt hours of electricity, therms of natural gas, tons of waste disposed, and vehicle miles traveled (VMT) from trips with an origin or destination in Vallejo. In 2008, the City of Vallejo emitted approximately 588,040 metric tons of carbon dioxide equivalents (MTCO<sub>2</sub>e).

Stationary source emissions have also been examined in this emissions inventory. Stationary sources are defined as any fixed emitter of air pollutants, such as power plants, petroleum refineries, petrochemical plants, food processing plants, and other heavy industrial sources. BAAQMD provided a list of stationary source emissions within the City of Vallejo totaling 9,630 MTCO<sub>2</sub> in 2008.

Stationary source emissions are included in the GHG emissions reduction strategy for informational purposes only, as stationary source emissions are most effectively addressed and regulated by BAAQMD or through federal and state programs. The baseline inventory is intended to guide future local policy decisions that relate to emissions within the City's control; therefore, stationary source emissions are excluded from all further discussions of the inventory for the purpose of setting accurate emissions reduction targets.

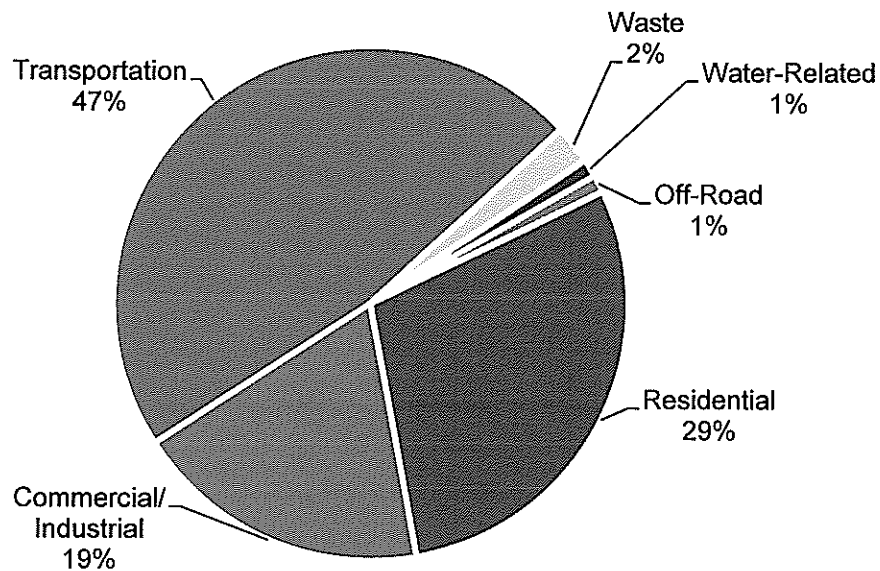
# BAAQMD Compliance

APPENDIX B

## 2008 GHG Emissions by Sector

Sector	2008 Metric Tons CO <sub>2</sub> e	% of Total
Residential	172,310	29%
Commercial/ Industrial	110,390	19%
Transportation	277,720	47%
Waste	14,640	2%
Water-Related	6,570	1%
Off-Road	6,410	1%
Total	588,040	100%

## 2008 GHG Emissions by Sector



# BAAQMD Compliance

## GHG Emissions Projections

The basis for all growth scenarios is a business-as-usual (BAU) projection. The BAU projection forecasts emissions to reflect the City's desired growth projections without regulatory or technical intervention to reduce GHG emissions. The BAU projection is based on population, housing, employment, and vehicles miles traveled projections for 2020 and 2035. The population, housing, and employment forecasts come from the Association of Bay Area Government's 2009 Projections, while VMT projections are from the Metropolitan Transportation Commission's County-Specific Growth Estimates from the Transportation 2035 Plan.

### Vallejo Community Growth Indicators

Growth Indicator	2008	2020	2035	Applied to...
Service Population	153,548	168,690	189,820	Waste Water
Households	41,640	44,480	47,940	Residential Energy
Annual VMT	652,399,900	706,665,400	766,375,500	Transportation
Employment	33,082	37,790	45,920	Commercial & Industrial Energy

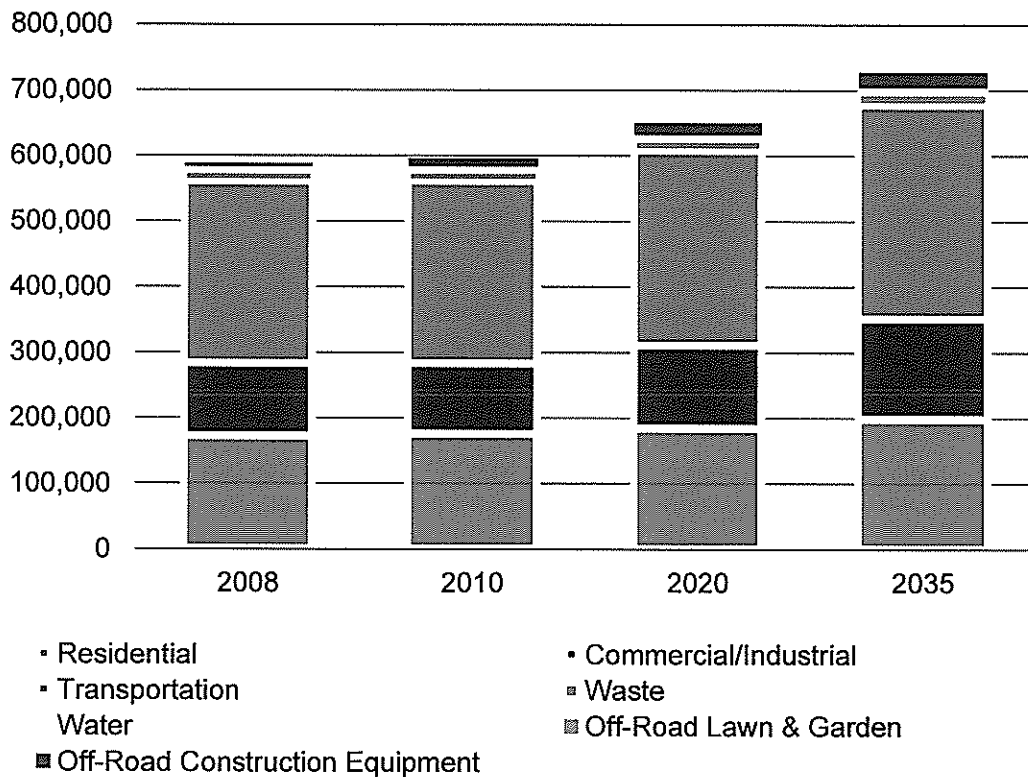
These indicators are then applied to the 2008 GHG emissions inventory to determine a business-as-usual growth scenario. Under the business-as-usual scenario, community-wide emissions will grow by approximately 11% by the year 2020 to 650,340 MTCO<sub>2</sub>e and by 24% by 2035 to 728,170 MTCO<sub>2</sub>e



# BAAQMD Compliance

APPENDIX B

## GHG Emissions Forecast, 2008–2035



In addition to AB 32, California has adopted and started to implement several state-level programs that will impact local GHG emissions. In order to effectively determine the emissions reductions that will need to be implemented at the local level to meet the City's emissions reduction target, the impact of state-level programs has been incorporated into an adjusted business-as-usual forecast. The state-level programs included in this adjusted forecast include the Renewable Portfolio Standard (RPS), updates to Title 24 Energy Efficiency Standards, California Solar Initiative Rebates, and the implementation of the Clean Car Fuel Standard, commonly referred to as the Pavley Standard. The impact of these state programs will play a critical role in helping Vallejo to achieve the emissions reduction target.

# BAAQMD Compliance

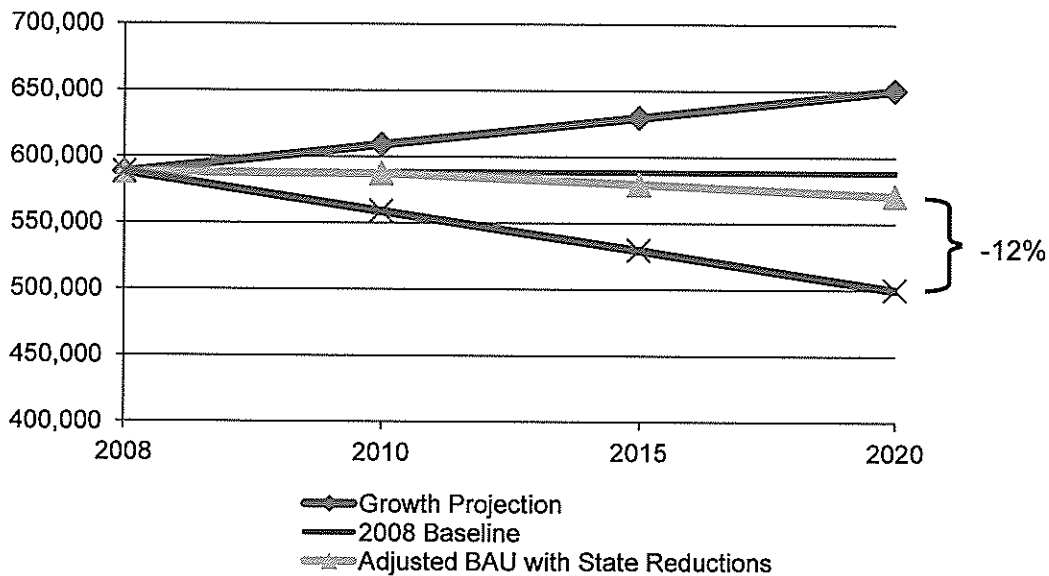
State Reductions Summary	2008	2010	2020	2035
Growth Projection	588,040	595,600	650,340	728,170
Pavley I Reductions	0	-7,770	-23,510	-38,370
RPS Reductions	0	0	-8,250	-26,310
CSI Reductions	0	0	-47,200	-78,340
Title 24 Reductions	0	-520	-520	-520
<b>Total State Reductions</b>	<b>0</b>	<b>-8,290</b>	<b>-79,480</b>	<b>-143,540</b>
<b>Adjusted Growth Projection</b>	<b>588,040</b>	<b>587,310</b>	<b>570,860</b>	<b>584,630</b>

State Reductions Summary	2008	2010	2020	2035
Growth Projection	588,040	595,600	650,340	728,170
Pavley I Reductions	0	-7,770	-23,510	-38,370
RPS Reductions	0	0	-8,250	-26,310
CSI Reductions	0	0	-47,200	-78,340
Title 24 Reductions	0	-520	-520	-520
<b>Total State Reductions</b>	<b>0</b>	<b>-8,290</b>	<b>-79,480</b>	<b>-143,540</b>
<b>Adjusted Growth Projection</b>	<b>588,040</b>	<b>587,310</b>	<b>570,860</b>	<b>584,630</b>

## GHG Emissions Reduction Target

The City of Vallejo has set a GHG emissions reduction target of 15% below 2008 baseline levels by 2020. This target is consistent with the State's direction to local governments in the AB 32 Scoping Plan and is equivalent to reducing local GHG emissions to 1990 levels.

## City reduction target



## GHG Reduction Measures

The GHG reduction measures included in this Climate Action Plan demonstrate the City's ability to reach the GHG reduction target of 15% below baseline levels by 2020. Emissions reductions were quantified for three different years: 2010, 2020, and 2035. Emissions reductions for 2010 have been quantified to demonstrate the actual emissions reduction progress that the City has already made in implementing measures within the CAP, while the 2020 and 2035 emissions reductions are the potential reductions that will be achieved through the implementation of these measures over the next several years. The GHG reduction strategies are separated by goal or topic area to correspond with the sectors or and sources of GHG emissions as follows:

- City Government Operations
- Community Engagement
- Energy
- Renewable Energy
- Transportation Demand Management
- Optimized Travel
- Water, Wastewater, and Solid Waste
- Off-Road Equipment

# BAAQMD Compliance

## GHG Reduction Summary by Topic

Sector	2010 GHG Reductions (MTCO <sub>2</sub> e/yr)	2020 GHG Reductions (MTCO <sub>2</sub> e/yr)	2025 GHG Reductions (MTCO <sub>2</sub> e/yr)
City Government Operations (CG)	-40	-4,200	-8,090
Community Engagement (CE)	--	--	--
Energy (E)	-270	-26,020	-42,280
Renewable Energy (RE)	--	-32,380	-60,030
Transportation Demand Management (TDM)	-4,770	-13,400	-19,220
Optimized Travel (OT)	--	-19,920	-21,150
Water, Wastewater, and Solid Waste (W)	-3,070	-8,920	-15,140
Off-Road Equipment (OR)	--	-30	-50
Adaptation	--	--	--
<b>Total Reductions</b>	<b>-8,150</b>	<b>-104,870</b>	<b>-167,350</b>
Emissions Forecast	595,600	650,340	728,170
State Reductions	-8,290	-79,480	-143,540
Local Reductions	-8,150	-104,870	-167,350
Net Emissions	579,160	465,990	417,280
Percentage Change from 2008 Levels	-2%	-21%	-29%

Implementation of the GHG reduction strategies included in this CAP will at a minimum 15% reduction below 2008 baseline levels by 2020.

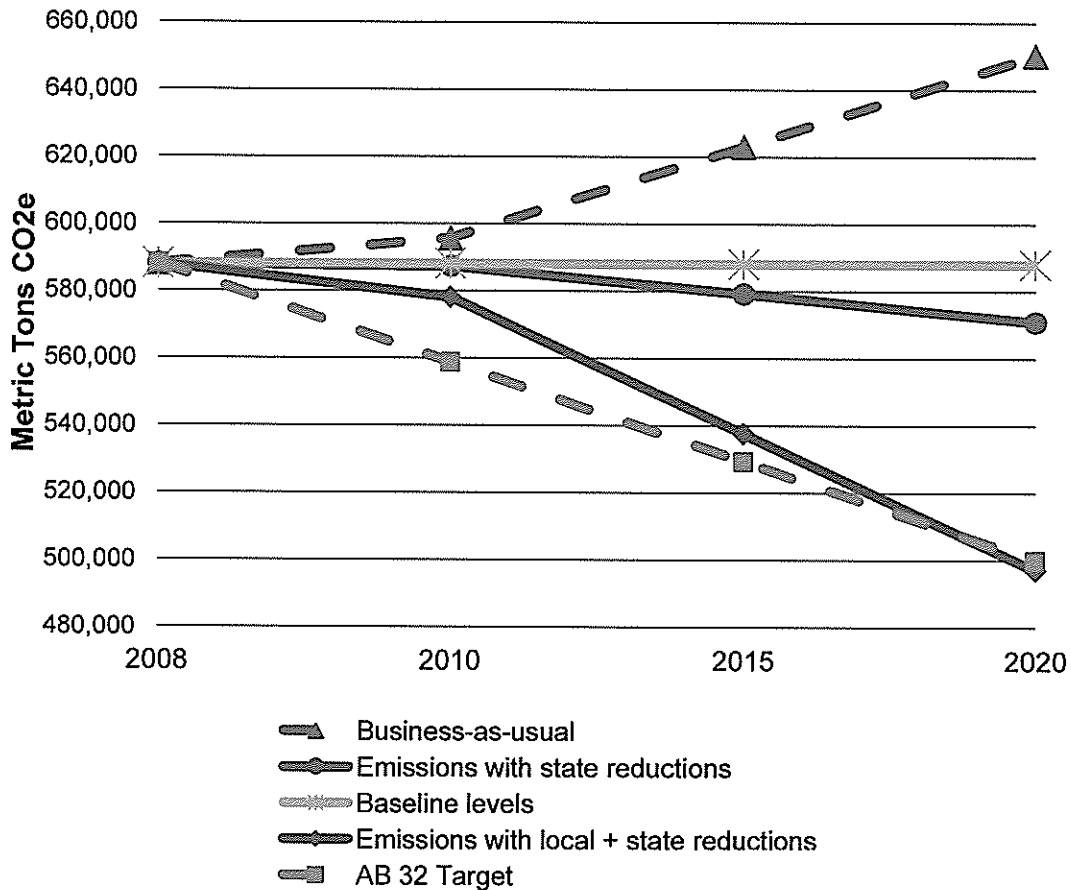
In addition to quantifying the emissions reductions associated with each strategy in the CAP, BAAQMD guidelines recommended that the City clearly specify the measures within the CAP applicable to new construction projects to demonstrate compliance with the City's GHG emissions reduction strategy and determine that the project's GHG emissions are less than significant. To ensure that each new construction project complies with the City's CAP, a checklist has been developed to be submitted by the project applicant.

# BAAQMD Compliance

APPENDIX B

# BAAQMD Compliance

Attainment of 2020 Reduction Target



## Implementation and Monitoring

To ensure the timely implementation of the City’s CAP, the City will identify staff to coordinate City Green Team meetings, track implementation of GHG reduction strategies and progress toward GHG reduction targets, and prepare annual reports to the City Council on CAP implementation and progress. To assist staff, the City has developed an implementation and monitoring tracking tool that identifies the major implementation milestones and the necessary actions to be taken for each measure. The tool enables the City to quickly update the GHG emissions inventory and streamline the reporting of CAP implementation on an annual basis. The monitoring tool also outlines the necessary procedures to update the inventory and reduction measures every 3–5 years. This tool that will serve as the primary instrument in measuring the City’s progress toward achieving emissions reduction targets and to ensure timely implementation occurs.

## Public Process and Environmental Review

The final requirement of a qualified GHG emissions reduction strategy is to adopt the plan through a public hearing process following environmental review. The City has involved numerous stakeholders throughout the development of the CAP. The Plan will undergo environmental review as part of the public hearing and adoption process.

During the development of the CAP, the City has engaged stakeholders and interested community members during three public workshops. The public has also had opportunities to participate in the development of this CAP through the public hearing and review process at Planning Commission and City Council meetings.

In order to operate effectively as a programmatic tiering document, the California State Attorney General's Office and BAAQMD both recommend integration of components of the GHG emissions reduction strategy into the General Plan. This integration will identify how the GHG emissions reduction strategy operates as a stand-alone policy and implementation document that is updated on a regular basis to respond to updates to science, technology, and policy. The GHG emissions reduction strategy will contribute to the General Plan's policies and will serve as mitigation for the City's GHG emissions.

The City has initiated the environmental review process to comply with the requirements of the California Environmental Quality Act. The City has prepared an initial environmental study and negative declaration finding that the CAP will have a less than significant environmental impact.



**APPENDIX C**

City of Vallejo Climate Action Plan

**Technical Appendix**



## CG-1 GREEN TEAM

Create a City Green Team, or other similar working group, to identify, prioritize, and implement greenhouse gas (GHG) reduction projects, including education.

### Action Items:

- Form a multidepartmental Green Team to identify, prioritize, and implement GHG reduction projects for City operations such as commute programs, recycling efforts, and procurement policies consistent with the CAP.
- Provide energy and GHG reduction training to existing staff.

Target Year	GHG Reduction (MTCO <sub>2</sub> e/yr)	Performance Indicator
2010 Reductions (MTCO <sub>2</sub> e):	Supporting Measure	N/A
2020 Reductions (MTCO <sub>2</sub> e):	Supporting Measure	N/A
2035 Reductions (MTCO <sub>2</sub> e):	Supporting Measure	N/A

## CG-2 CAP IMPLEMENTATION

See to the timely implementation of CAP strategies by establishing an implementation and reporting infrastructure.

### Action Items:

- Designate a City staff member of the Green Team to have lead responsibilities for implementing the Climate Action Plan. Duties of this position include coordination of the Green Team, preparation of annual CAP implementation priorities, and tracking City government and community-wide greenhouse gas emissions.
- On an annual basis, report to the City Council on the City's progress toward CAP implementation and GHG reduction targets.
- Identify and pursue grants to fund CAP implementation strategies.

Target Year	GHG Reduction (MTCO <sub>2</sub> e/yr)	Performance Indicator
-------------	--	-----------------------

2010 Reductions (MTCO <sub>2</sub> e):	Supporting Measure	N/A
2020 Reductions (MTCO <sub>2</sub> e):	Supporting Measure	N/A
2035 Reductions (MTCO <sub>2</sub> e):	Supporting Measure	N/A

### CG-3 LIGHTING

Retrofit City-owned or -operated lighting and related mechanical systems.

#### Action Items:

- Retrofit City streetlights, outdoor lighting, and traffic signals with high-efficiency lights such as light-emitting diode (LED) or induction lighting.
- Rewire lighting circuits to allow for user control of task lighting, sensors, Building Management System (BMS) control, and day lighting modulated control.
- Adjust the lighting schedule of street lighting and other exterior lighting to minimize the use of lighting at unnecessary or underutilized times.

Target Year	GHG Reduction (MTCO <sub>2</sub> e/yr)	Performance Indicator
2010 Reductions (MTCO <sub>2</sub> e):	-40	N/A
2020 Reductions (MTCO <sub>2</sub> e):	-520	50% of streetlight fixtures replaced
2035 Reductions (MTCO <sub>2</sub> e):	-1,000	100% of streetlight fixtures replaced

#### Methodology:

The City has already completed several indoor and outdoor lighting retrofits through the Association of Bay Area Governments Energy Watch Partnership, totaling an annual reduction of 135,500 kWh of electricity. The City will replace 50% of all existing streetlights with LED light bulbs by 2020 and 100% by 2035. LED lighting will reduce energy use from streetlights by approximately 60% from incandescent street lighting.

#### Sources:

City of Little Rock. 2003. "Conventional vs. LED Traffic Signals; Operational Characteristics and Economic Feasibility." Little Rock, AR.

Energy Solutions. 2009. City of Vallejo Energy Efficiency Conservation Strategy Preliminary Results.

U.S. Department of Energy and Pacific Gas & Electric. 2008. LED Street Lighting: U.S. DOE Solid-State Lighting Technology Demonstration Gateway Program and PG&E Emerging Technologies Program.

[http://apps1.eere.energy.gov/buildings/publications/pdfs/ssl/gateway\\_sf-streetlighting.pdf](http://apps1.eere.energy.gov/buildings/publications/pdfs/ssl/gateway_sf-streetlighting.pdf).

## CG-4 RENEWABLE ENERGY

Continue to install renewable energy systems on City properties.

### Action Items:

Identify cost-effective renewable energy opportunities for additional City properties and apply for federal, state, and utility grant and funding opportunities when they become available.

Target Year	GHG Reduction (MTCO <sub>2</sub> e/yr)	Performance Indicator
2010 Reductions (MTCO <sub>2</sub> e):	0	N/A
2020 Reductions (MTCO <sub>2</sub> e):	-1,230	Install an additional 2.75 MW of renewable energy
2035 Reductions (MTCO <sub>2</sub> e):	-2,310	Install an additional 5.5 MW of new renewable energy

### Methodology:

The preliminary results of Vallejo's Energy Efficiency Conservation Strategy identified potential City facilities to install additional renewable energy equipment, up to 5.5 additional megawatts of energy. By 2020, the City will install 2.75 MW of renewable energy to offset energy use at City facilities.

### Sources:

Energy Solutions. 2009. City of Vallejo Energy Efficiency Conservation Strategy Preliminary Results.

## CG-5 BUILDING & FACILITY EFFICIENCY

Reduce energy consumption from City facilities by 20% by 2035 through energy efficiency improvements.

### Action Items:

- Create a City Government Energy Fund to reinvest annual cost savings from energy efficiency improvements for additional energy efficiency programs.
- Complete energy and water audits of City facilities to identify building inefficiencies—and prioritize the

## GHG Reduction Technical Appendix

implementation of cost-effective energy and water efficiency retrofits—with a payback of less than 10 years.

- Emphasize water management and reclamation for schools, parks, golf courses, and manufacturing processes to reduce City energy use related to the pumping and treatment of water.
- Schedule regular operating hours and restrict facility use in a manner that reduces inefficient use of buildings or rooms.
- Explore the City's use of technical equipment and identify opportunities for low-power alternatives, such as tablet computers or networked copiers.
- Optimize the City Data Center by identifying and implementing energy efficiency measures to City data centers, computer systems, and related equipment.

Target Year	GHG Reduction (MTCO <sub>2</sub> e/yr)	Performance Indicator
2010 Reductions (MTCO <sub>2</sub> e):	0	N/A
2020 Reductions (MTCO <sub>2</sub> e):	-940	Reduce energy consumption in City and VSFCF facilities by 10%
2035 Reductions (MTCO <sub>2</sub> e):	-1,870	Reduce energy consumption in City and VSFCF facilities by 20%

### Methodology:

This policy directs the City and the Vallejo Sanitation and Flood Control District to reduce energy use at all City facilities by 20% by 2035. This measure quantifies the energy reductions associated with a 10% reduction in electricity and natural gas use at City facilities by 2020 and a 20% reduction by 2035.

### Sources:

Energy Solutions. 2009. City of Vallejo Energy Efficiency Conservation Strategy Preliminary Results.

## CG-6 NEW BUILDING & FACILITY EFFICIENCY

Apply CALGreen Tier 1 energy efficiency standards to all new City facilities.

### Action Items:

- Require new municipal facilities to meet CALGreen Tier 1 standards. Tier 1 prerequisites include requirements to install cool roofs, provide preferential parking for low-emitting vehicles, exceed Title 24 requirements, reduce indoor potable water use and outdoor landscaping water use, and include

# GHG Reduction Technical Appendix

APPENDIX C

recycled materials within new facilities.

- Encourage Leadership in Energy and Environmental Design (LEED) , CALGreen, or or similar best practices for new buildings and facilities as well as remodels.

Target Year	GHG Reduction (MTCO <sub>2</sub> e/yr)	Performance Indicator
2010 Reductions (MTCO <sub>2</sub> e):	Unknown	All new buildings meet CALGreen Tier 1, as amended
2020 Reductions (MTCO <sub>2</sub> e):	Unknown	All new buildings meet CALGreen Tier 1, as amended
2035 Reductions (MTCO <sub>2</sub> e):	Unknown	All new buildings meet CALGreen Tier 1, as amended

## Methodology:

With uncertainty as to how Vallejo's government facilities will grow over the next 25 years, the City has not quantified the GHG impact that will occur when building new facilities to comply with the Tier 1 requirements of CALGreen. The energy efficiency component of Tier 1 requires buildings to exceed Title 24 energy efficiency requirements by a minimum of 15%.

## Sources:

California Building Standards Commission. 2010. California Code of Regulations Title 24: Part 11 - California Green Building Standards Code.

## CG-7 REPLACEMENT VEHICLES

Purchase fuel-efficient and alternatively fueled vehicles.

## Action Items:

- Adopt a City policy to incrementally replace appropriate fleet vehicles and buses with more fuel-efficient and lower-carbon-emitting models per the standard turnover schedule. Alternative fuels and vehicles include liquefied petroleum gas (LPG), compressed natural gas (CNG), biodiesel, hybrid vehicles, and plug-in electric vehicles.
- Use Global Positioning System (GPS) tools to map routes and path of travel to control fuel and wear and tear on vehicles.

## GHG Reduction Technical Appendix

- Extend the replacement time on maintained vehicle pools.
- Ensure that vehicle sizes are appropriate for the job performed.

Target Year	GHG Reduction (MTCO <sub>2</sub> e/yr)	Performance Indicator
2010 Reductions (MTCO <sub>2</sub> e):	0	N/A
2020 Reductions (MTCO <sub>2</sub> e):	-1,420	Increase the number of hybrid vehicles to 18; improve transit fleet MPG average to 6
2035 Reductions (MTCO <sub>2</sub> e):	-2,820	Increase the number of hybrid vehicles to 23; improve transit fleet average MPG to 7.5

### Methodology:

The City will continue to improve the fuel efficiency of transit and police vehicles as they are replaced and purchase additional hybrid vehicles for general fleet use. By 2020, the City will increase transit fleet fuel efficiency by 20% and increase the fuel efficiency of police vehicles by 70%. For general fleet vehicles, the City already utilizes 12 hybrid vehicles and will continue to purchase and replace existing vehicles with hybrid and alternative fuel vehicles as financially feasible. .

### Sources:

City of Vallejo. 2010. City of Vallejo Greenhouse Gas Emissions Inventory.

U.S. Department of Energy. 2011. FuelEconomy.gov. <http://fuelconomy.gov/>.

## CG-8 EMPLOYEE COMMUTE ALTERNATIVES

Provide information and incentives for City staff to carpool, use public transportation, walk, or bike to work.

### Action Items:

- Designate an Employee Commute Alternatives Coordinator to implement and support trip reduction programs.
- Promote carpooling by providing a website or message board for coordinating shared rides and designating a percentage of conveniently located parking spaces for carpooling vehicles. Enact a guaranteed ride home program for employees who carpool, take public transit, or use other

alternative modes of transportation.

- Provide recognition awards to City departments and employees with high carpooling, transit, biking, and walking to work participation rates.
- For external meetings, select a centrally located site to meet. Make provisions for secure and safe bike storage at City facilities.

Target Year	GHG Reduction (MTCO <sub>2</sub> e/yr)	Performance Indicator
2010 Reductions (MTCO <sub>2</sub> e):	0	N/A
2020 Reductions (MTCO <sub>2</sub> e):	-90	Reduce employee commute VMT by 5.2%
2035 Reductions (MTCO <sub>2</sub> e):	-90	Reduce employee commute VMT by 5.2%

### Methodology:

Increased participation in rideshare programs will reduce the City's employee commute VMT by 5.2%.

### Sources:

California Air Pollution Control Officers Association. 2010. Quantifying and Mitigating Greenhouse Gas Emissions.

## CE-1 STUDENT OUTREACH

Engage students in the City's GHG reduction efforts through outreach to K–12 schools and colleges.

### Action Items:

- Create a collaboration between the City Green Team and Vallejo schools to:
- Inform students about climate change, water conservation, and recycling and ways to reduce GHG emissions.
- Sponsor competitions and contests with prizes for promoting climate protection and reducing GHG emissions.
- Partner with professional associations to develop strategies to reduce GHG emissions at the local level.

# GHG Reduction Technical Appendix

Target Year	GHG Reduction (MTCO <sub>2</sub> e/yr)	Performance Indicator
2010 Reductions (MTCO <sub>2</sub> e):	Supporting Measure	Number of climate-related school events or visits
2020 Reductions (MTCO <sub>2</sub> e):	Supporting Measure	Number of climate-related school events or visits
2035 Reductions (MTCO <sub>2</sub> e):	Supporting Measure	Number of climate-related school events or visits

## CE-2 COMMUNITY OUTREACH

Engage the general community in the City's GHG reduction efforts through print, online, and in-person outreach mechanisms.

### Action Items:

- Educate and inform residents and businesses about CAP implementation strategies and ways in which they can support the City's GHG reduction goals through changes to their behavior or environment.
- Identify a primary location in Vallejo for deposit and distribution of information regarding GHG management.
- Cooperate with the schools, business community, and community groups to develop an online one-stop shop for GHG information and resources.
- Use the City newsletter to communicate and raise awareness of sustainable practices, with an emphasis on illustrating cost savings and benefits to all consumers.

Target Year	GHG Reduction (MTCO <sub>2</sub> e/yr)	Performance Indicator
2010 Reductions (MTCO <sub>2</sub> e):	Supporting Measure	Number of community outreach events
2020 Reductions (MTCO <sub>2</sub> e):	Supporting Measure	Number of community outreach events
2035 Reductions (MTCO <sub>2</sub> e):	Supporting Measure	Number of community outreach events

## E-1 BUILDING STOCK: EXISTING

Facilitate energy efficiency upgrades and retrofits in existing commercial, residential, and industrial



# GHG Reduction Technical Appendix

APPENDIX C

buildings by connecting residents and businesses with technical and financial assistance.

## Action Items:

- Connect businesses and residents with voluntary programs that provide free or low-cost energy efficiency audits and retrofit installations.
- Develop an outreach program to encourage participation in low-income weatherization programs.
- Work collaboratively with Solano County, other municipalities in the region, and the Association of Bay Area Governments (ABAG), and participate in regional energy efficiency financing programs such as low-interest revolving loan funds, the California Comprehensive Residential Building Retrofit Program, or a Property Assessed Clean Energy (PACE) program that enables Vallejo property owners to obtain low-interest financing for energy improvements.
- Consider creating a Residential Energy Conservation Ordinance (RECO) and Commercial Energy Conservation Ordinance (CECO) to require point-of-sale energy audits and retrofits for all buildings that do not meet minimum energy efficiency requirements.

Target Year	GHG Reduction (MTCO <sub>2</sub> e/yr)	Performance Indicator
2010 Reductions (MTCO <sub>2</sub> e):	-270	N/A
2020 Reductions (MTCO <sub>2</sub> e):	-22,840	650 low-income homes weatherized; 3,300 homes participating in a PACE program
2035 Reductions (MTCO <sub>2</sub> e):	-36,670	1,600 low-income homes weatherized; 6,500 homes participating in a PACE program

## Methodology:

The GHG and energy reduction benefits from this measure will occur through the implementation of energy efficiency programs in Vallejo. These programs include a low-income weatherization program, an energy efficiency financing program, and the impact of energy conservation outreach. Participation in energy efficiency programs and the average energy savings per participant is based on program evaluations and research of existing programs in other jurisdictions.

## Sources:

City of Berkeley. 2010. Berkeley FIRST Initial Evaluation. Berkeley, CA.

National Resources Defense Council; PACE Now; Renewable Funding LLC; The Vote Solar Initiative.

2010. Property Assessed Clean Energy Programs White Paper.

Sacramento Metropolitan Air Quality Management District. 2009. Spare the Air Control Measure Program; Revision to State Implementation Plan Staff Report. <http://www.airquality.org/notices/CAPUpdate/STA-revisiontoSIP-StaffRpt23April2009.pdf>.

State of California, Community Services and Development. 2009. CSD Helps Low-Income Families Manage and Reduce Energy Costs. [http://www.csd.ca.gov/Contractors/documents/Energy%20tab/LIHEAP-DOE%20Fact%20Sheet%20\(2008\).pdf](http://www.csd.ca.gov/Contractors/documents/Energy%20tab/LIHEAP-DOE%20Fact%20Sheet%20(2008).pdf).

State of California, Department of Finance. 2008. California Statewide Population.

## E-2 BUILDING STANDARDS

Require all new development to meet the minimum California Title 24 and California Green Building Standards Code requirements, as amended, and encourage new development to exceed the minimum requirements.

### Action Items:

- Adopt the California Title 24 minimum requirements and encourage new construction and major remodels, , to adhere to a Tier 1 or Tier 2 standard of the CALGreen Code.
- Require newly constructed buildings and recommend that remodels over 50% and tenant improvements demonstrate compliance with the mandatory CALGreen Code requirements by completing a green building checklist when submitting a request for building permits.
- Consider requiring new development to comply with the Tier 1 requirements of CALGreen, Part 11 of the California Building Standards Code. This optional measure may be necessary to address any shortfall in attaining reduction objectives.

Target Year	GHG Reduction (MTCO <sub>2</sub> e/yr)	Performance Indicator
2010 Reductions (MTCO <sub>2</sub> e):	Supporting Measure	N/A
2020 Reductions (MTCO <sub>2</sub> e):	Supporting Measure	All buildings meet Title 24 Part 6, as amended
2035 Reductions (MTCO <sub>2</sub> e):	Supporting Measure	All buildings meet Title 24 Part 6, as amended

## Methodology:

Reduction in electricity and natural gas use from new buildings is based on average energy reductions by building type and climate zone as provided in the California Air Pollution Control Officers Association's (CAPCOA) Quantifying Greenhouse Gas Mitigation Measures.

## Sources:

California Air Pollution Control Officers Association. 2010. "Quantifying Greenhouse Gas Mitigation Measures."

California Building Standards Commission. 2010. 2010 California Green Building Standards Code. Sacramento, CA: California Building Standards Commission.

California Energy Commission. 2007. Impact Analysis: 2008 Update to the California Energy Efficiency Standards for Residential and Nonresidential Buildings. Sacramento, CA: California Energy Commission.

## E-3 SMART METERS

Increase the community's awareness and utilization of real-time energy consumption data available through PG&E's SmartMeter program.

### Action Items:

- Support PG&E's installation of SmartMeters on commercial and residential properties by informing the community of the GHG and energy cost-saving potential of the devices.
- Require newly constructed buildings and recommend that major remodels, over 50%, install indoor real-time energy monitors.
- Inform the community of metering options, such as online applications and in-home monitors.
- Connect businesses and residents with rebate programs that give priority to appliances with smart grid technology.

Target Year	GHG Reduction (MTCO <sub>2</sub> e/yr)	Performance Indicator
2010 Reductions (MTCO <sub>2</sub> e):	0	N/A
2020 Reductions (MTCO <sub>2</sub> e):	-2,960	60% of homes and 50% of businesses with energy monitors
2035 Reductions (MTCO <sub>2</sub> e):	-5,220	80% of homes and 75% of

**Methodology:**

Smart grid integration will reduce energy demand through continuous feedback of real-time energy use. Research has shown that when building users are reminded of their energy use more frequently, higher energy savings will be achieved. Additional energy savings will be achieved through the installation of smart grid appliances that can be pre-programmed to run at off-peak energy times.

**Sources:**

Ehrhardt-Martinez, K., K. Donnelly, and J. Laitner. 2010. Advanced Metering Initiatives and Residential Feedback Programs: A Meta-Review for Household Electricity-Savings Opportunities. Washington, D.C.: American Council for an Energy-Efficient Economy.

Pike Research. 2010. Smart appliance sales to start off slow, but 118 million units will be sold worldwide by 2019. <http://www.smartgridnews.com/artman/publish/Smart-Grid-Press-Releases/Smart-appliance-sales-to-start-off-slow-but-118-million-units-will-be-sold-worldwide-by-2019-forecasts-Pike-Research-3290.html>.

U.S. Department of Energy. 2008. Energy Star. Clothes Washer Product Snapshot. [http://www.energystar.gov/ia/partners/reps/pt\\_reps\\_res\\_retail/files/CW\\_ProductSnapshot\\_May08.pdf](http://www.energystar.gov/ia/partners/reps/pt_reps_res_retail/files/CW_ProductSnapshot_May08.pdf).

———. n.d. Energy Star. Residential New Construction: An Overview of Energy Use and Energy Efficiency Opportunities. [http://www.energystar.gov/ia/business/challenge/learn\\_more/ResidentialNewConstruction.pdf](http://www.energystar.gov/ia/business/challenge/learn_more/ResidentialNewConstruction.pdf).

**E-4 COOL ROOFS AND PAVEMENTS**

Increase tree planting and the use of cool roofs and cool pavement materials to reduce the urban heat island effect and corresponding energy consumption. Implement tree replacement policy for projects where tree removal is necessary.

**Action Items:**

- Actively inspect and enforce state requirements for cool roofs on residential and nonresidential roofing projects. Require new buildings to meet Title 24 and recommend that new buildings meet CALGreen Tier 1 requirements for cool roofs, which require a minimum solar reflectance index (SRI) of 10 for steep slope roofs and 64 for low slope roofs.
- Establish standards for new development and major remodels (to be defined) to reduce exterior heat gain for 50% of non-roof impervious site surfaces (roads, sidewalks, courtyards, parking lots,

# GHG Reduction Technical Appendix

APPENDIX C

driveways) through one or more of the following mechanisms:

- Achieve 50% paved surface shading within five to ten years by planting trees and other vegetation and/or installing solar panels or shading structures above parking.
- Use paving materials with an SRI of at least 29 for all surfaces.
- Maintain and expand Vallejo's urban forest, including street trees and trees on private property.
- For public improvements and public projects, require the use of high albedo paving material for sidewalks, roads, crosswalks, parking lots, and driveways.

Target Year	GHG Reduction (MTCO <sub>2</sub> e/yr)	Performance Indicator
2010 Reductions (MTCO <sub>2</sub> e):	0	N/A
2020 Reductions (MTCO <sub>2</sub> e):	-220	All paved surfaces meeting an SRI of 29 or higher
2035 Reductions (MTCO <sub>2</sub> e):	-390	All paved surfaces meeting an SRI of 29 or higher

## Methodology:

This measure includes the GHG benefit of cool pavements. Cool pavements retain less heat than traditional pavement materials like black asphalt, causing urban surface temperatures to decrease and creating less demand for air conditioning in buildings. Please note that this measure does not include the GHG impact of cool roofs, which is included in the quantification of the 2008 CALGreen Code (State mandated).

## Sources:

Akbari, Hashem. Energy Savings Potentials and Air Quality Benefits of Urban Heat Island Mitigation. <http://heatisland.lbl.gov/>.

California Building Standards Commission. 2010. California Code of Regulations, Title 24: Part 11: California Green Building Standards Code. [http://www.documents.dgs.ca.gov/bsc/CALGreen/2010\\_CA\\_Green\\_Bldg.pdf](http://www.documents.dgs.ca.gov/bsc/CALGreen/2010_CA_Green_Bldg.pdf).

U.S. Environmental Protection Agency. 2005. Reducing Urban Heat Island Compendium of Strategies: Cool Pavements. <http://www.epa.gov/heatisd/resources/pdf/CoolPavesCompendium.pdf>.

## RE-1 RENEWABLE ENERGY INSTALLATIONS

Support the installation of small-scale renewable energy systems including solar photovoltaic, solar thermal, and wind, river current, and tidal energy conversion systems.

### Action Items:

- Update the Zoning Code to define a renewable energy strategy that removes barriers to small-scale solar energy systems.
- Revise the permit processes and fees as appropriate to remove barriers to and incentivize the installation of renewable energy systems in accordance with applicable safety and environmental standards.
- Provide training to at least one designated Planning and one Building staff member to enable knowledgeable and expeditious processing of renewable energy applications.
- Encourage new homes and businesses to be pre-wired and pre-plumbed for solar and solar thermal installations.
- Evaluate site-specific opportunities and constraints related to Vallejo's proximity to the San Francisco Bay and to rivers, channels, and lakes, both man-made and natural.

Target Year	GHG Reduction (MTCO <sub>2</sub> e/yr)	Performance Indicator
2010 Reductions (MTCO <sub>2</sub> e):	Supporting Measure	Percentage of new buildings pre-wired for solar installations
2020 Reductions (MTCO <sub>2</sub> e):	Supporting Measure	Percentage of new buildings pre-wired for solar installations
2035 Reductions (MTCO <sub>2</sub> e):	Supporting Measure	Percentage of new buildings pre-wired for solar installations

## RE-2 RENEWABLE ENERGY FINANCING

Connect residents and businesses with renewable energy incentives and low-interest financing mechanisms.

### Action Items:

- Participate in a regional financing program such as the Property Assessed Clean Energy (PACE)

# GHG Reduction Technical Appendix

APPENDIX C

program or equivalent that achieves similar results to provide low-interest financing for renewable energy installations.

- Designate a City staff person to coordinate local inquiries regarding the regional financing program.
- Train Planning and Building staff members on available state, regional, and utility-led financing mechanisms and incentives/rebates.
- Collaborate with neighboring jurisdictions and Solano County to explore the feasibility and cost of a community choice aggregation program.
- Set a renewable power generation goal for the City to increase community-wide energy generation.
- Work with Solano County to identify the benefits and costs of a community choice aggregation program and establish a stakeholder advisory group.

Target Year	GHG Reduction (MTCO <sub>2</sub> e/yr)	Performance Indicator
2010 Reductions (MTCO <sub>2</sub> e):	0	N/A
2020 Reductions (MTCO <sub>2</sub> e):	-32,380	25 MW of renewable energy installed
2035 Reductions (MTCO <sub>2</sub> e):	-60,030	47 MW of renewable energy installed

## Methodology:

Participation in renewable energy financing programs and the average energy savings per participant are based on program evaluations and research of existing programs in other jurisdictions.

## Sources:

California Energy Commission. 2010. New Solar Homes Partnership, Third Edition. Sacramento, CA: California Energy Commission.

California Energy Commission; California Public Utilities Commission. 2010. California Solar Initiative Program Data: Geographical Statistics. [http://www.californiasolarstatistics.ca.gov/reports/locale\\_stats/](http://www.californiasolarstatistics.ca.gov/reports/locale_stats/).

City of Berkeley. 2010. Berkeley FIRST Initial Evaluation. Berkeley, CA.

National Resources Defense Council; PACE Now; Renewable Funding LLC; The Vote Solar Initiative. 2010. Property Assessed Clean Energy Programs White Paper.

## TDM-1 LOCAL BUSINESSES

Promote buy local and related initiatives that support local commerce and reduce the need for extensive transport.

### Action Items:

- Support efforts that encourage people who live, work, or have businesses in Vallejo to buy local goods, food supplies, and services.
- Implement the elements of the Downtown Specific Plan that encourage the promotion of economic revitalization of the Downtown Commercial Area to create local options for commerce.
- Enact new or participate in existing award programs that recognize local employers who provide outstanding contributions to the quality of life in the community, including "green businesses."
- Promote cooperative benefits organizations to enable individual merchants to achieve benefits of scale and innovation to reduce energy consumption, establish recycling programs, and reduce water use.
- Support strategies to increase local business-to-business commerce.

Target Year	GHG Reduction (MTCO <sub>2</sub> e/yr)	Performance Indicator
2010 Reductions (MTCO <sub>2</sub> e):	0	N/A
2020 Reductions (MTCO <sub>2</sub> e):	-2,470	5.6% reduction in shopping-related VMT
2035 Reductions (MTCO <sub>2</sub> e):	-3,070	8% reduction in shopping-related VMT

### Methodology:

The 2011 Independent Business Survey found that independent business owners located in a community with a buy local campaign increased revenues by an average of 5.6% compared to 2010. A buy local campaign encourages the Vallejo community to make shopping trips within the community instead of going outside of the community for shopping and necessities. Local trips help to reduce the distance traveled for shopping purposes while supporting the local tax base.



**Sources:**

Institute for Local Self-Reliance. 2011. Buy Local First Survey. <http://www.ilsr.org/>.

U.S. Department of Transportation; Oak Ridge National Laboratory. 2004. Summary of Travel Trends: 2001 National Household Travel Survey. <http://nhts.ornl.gov/2001/pub/STT.pdf>.

## TDM-2 MIXED-USE, HIGHER-DENSITY, TRANSIT-ORIENTED DEVELOPMENT

Promote mixed-use, higher-density development near transit nodes.

**Action Items:**

- Continue to maintain the Downtown Commercial Area as a strong focal point to attract higher-density housing, business, and office use.
- Provide a high-quality and relatively high-density Downtown multi-family residential environment connected by selected transit-oriented priority areas and other transit corridors.
- Adopt incentives such as priority processing and revise codes to increase densities in the Downtown or within one-half mile of a regularly scheduled transit stop.
- Implement elements in the Downtown Specific Plan that encourage pedestrian-oriented plazas, walkways, bike trails, bike lanes, and street furniture and connections to other community areas. Promote pedestrian convenience and recreational opportunities through development conditions requiring sidewalks, walking paths, or hiking trails connecting various land uses and including safety amenities such as lighting and signage.
- Implement elements in the Downtown Specific Plan that promote mixed-use development and provide commercial services such as day care, restaurants, banks, and stores near to employment centers, where feasible.
- Support "complete streets" by incorporating applicable public transit, bicycle and pedestrian rights-of-way, and facilities for Vallejo community members when evaluating future expansion and new development of streets and highways.

Target Year	GHG Reduction (MTCO <sub>2</sub> e/yr)	Performance Indicator
2010 Reductions (MTCO <sub>2</sub> e):	-3,360	N/A
2020 Reductions (MTCO <sub>2</sub> e):	-4,270	50% of specific plans implemented

# GHG Reduction Technical Appendix

2035 Reductions (MTCO <sub>2</sub> e):	-5,590	100% of specific plans implemented
--	--------	------------------------------------

## Methodology:

This measure includes the GHG benefit of increased densities and diversity of land uses through the implementation of the Mare Island and Downtown Vallejo specific plans. Mixed-use development results in VMT reductions by shortening trip distances and improving accessibility to alternative modes of transportation.

## Sources:

California Air Pollution Control Officers Association. 2010. Quantifying Greenhouse Gas Mitigation Measures.

City of Vallejo. 2005. Downtown Vallejo Specific Plan.

## TDM-3 BICYCLE AND PEDESTRIAN TRAVEL

Expand and link the network of pedestrian and bicycle paths and facilities through preparation of a Bicycle and Pedestrian Master Plan, with the goal of increasing the bicycle and pedestrian mode share 20% by 2035.

## Action Items:

- Create a city-wide Bicycle and Pedestrian Master Plan to analyze existing and future pedestrian and bicycle infrastructure and facilities and to qualify for state and federal funding for bicycle- and pedestrian-related infrastructure.
- Pursue public and private funding to expand and link the network of pedestrian and bicycle paths and facilities beginning in selected, transit-oriented priority areas.
- Revise zoning standards to require the provision of bicycle support facilities (lockers, shower rooms, etc.) for appropriate development at a rate of 1 changing room and shower per 200 occupants.

Target Year	GHG Reduction (MTCO <sub>2</sub> e/yr)	Performance Indicator
2010 Reductions (MTCO <sub>2</sub> e):	0	N/A
2020 Reductions (MTCO <sub>2</sub> e):	-630	19 miles of new bike lanes installed
2035 Reductions (MTCO <sub>2</sub> e):	-800	25 miles of new bike lanes installed

## Methodology:

Providing pedestrian access and a bicycle network to link areas within the city encourages people to walk instead of drive. This mode shift results in people driving less and thus a reduction in VMT.

## Sources:

Dierkers, G., E. Silsbe, S. Stott, S. Winkelman, and M. Wubben. 2007. CCAP Transportation Emissions Guidebook. Center for Clean Air Policy. Washington, D.C. <http://www.ccap.org/safe/guidebook.php>. as cited in California Air Pollution Control Officers Association (CAPCOA) 2008. CEQA and Climate Change.

Nelson, Arthur C. and David Allen. 1997. If You Build Them, Commuters Will Use Them: Cross-Sectional Analysis of Commuters and Bicycle Facilities.

Solano County Transit Authority. 2010. Bicycle Plan Projects List. <http://www.sta.dst.ca.us/pdfs/Plans/FINAL%20Bike%20Projects%2003-15-10.pdf> (accessed January 21, 2011).

U.S. Census Bureau. 2010. American Communities Survey: City of Vallejo. [http://factfinder.census.gov/servlet/ADPTable?\\_bm=y&-geo\\_id=16000US0681666&-qr\\_name=ACS\\_2008\\_3YR\\_G00\\_DP3YR3&-context=adp&-ds\\_name=&-tree\\_id=3308&-\\_lang=en&-redoLog=false&-format=](http://factfinder.census.gov/servlet/ADPTable?_bm=y&-geo_id=16000US0681666&-qr_name=ACS_2008_3YR_G00_DP3YR3&-context=adp&-ds_name=&-tree_id=3308&-_lang=en&-redoLog=false&-format=).

U.S. Department of Transportation, Federal Highway Administration. 2009. National Household Travel Survey. <http://nhts.ornl.gov>.

U.S. Department of Transportation; Oak Ridge National Laboratory. 2004. Summary of Travel Trends: 2001 National Household Travel Survey. <http://nhts.ornl.gov/2001/pub/STT.pdf>.

## TDM-4 PARKING

Revise parking requirements for new commercial and multi-family residential projects and implement the Downtown Parking Meter Installation Plan.

## Action Items:

- Revise parking requirements for new commercial and multi-family residential projects to provide bike racks for 5% of the building's projected visitors within 200 feet of the building's entrance for commercial projects and one long-term bicycle storage space per two multi-family units.

# GHG Reduction Technical Appendix

- Allow up to a 15% reduction in required private vehicle parking spaces in new commercial and multi-family residential projects if justified in an approved trip reduction plan.
- Encourage shared parking programs in mixed-use and transit-oriented development areas.
- Design parking lots, where feasible, to include clearly marked and shaded pedestrian pathways between transit facilities and building entrances.

Target Year	GHG Reduction (MTCO <sub>2</sub> e/yr)	Performance Indicator
2010 Reductions (MTCO <sub>2</sub> e):	-0	N/A
2020 Reductions (MTCO <sub>2</sub> e):	-910	N/A
2035 Reductions (MTCO <sub>2</sub> e):	-1,830	N/A

## Methodology:

This measure relies on the Institute of Transportation Engineers (ITE) parking generation rates based on proposed land uses in the city and assumes a 15% reduction in parking spaces compared to ITE rates. Additionally, this measure assumes that the City will implement a metered parking program in the downtown areas specified in the Downtown Parking Management Plan by 2020.

## Sources:

City of Vallejo. 2005. Downtown Vallejo Specific Plan.

City of Vallejo. 2007. Downtown Parking Management Plan. <http://www.ci.vallejo.ca.us/uploads/56/010208%20-%20Downtown%20Parking%20Management%20Plan%20-%20Draft%20Executive%20Summare%2011192007.pdf>

City of Vallejo. 2010. Municipal Code. <http://library.municode.com/index.aspx?clientId=16106&stateId=5&stateName=California&customBanner=16106.jpg&imageclass=L&cl=16106.txt>.

## TDM-5 TRANSIT

Support a convenient, attractive, and comprehensive transit system.

## Action Items:

- Prioritize and pursue transit improvements that serve local businesses and job sites.

# GHG Reduction Technical Appendix

APPENDIX C

- Encourage major employers to provide free or discounted transit passes or other incentives to employees for using transit.
- On Mare Island, create a network of bicycle and pedestrian paths that connect with transit services, combined with a street framework that is transit-friendly and sensitive to Mare Island's historic character.

Target Year	GHG Reduction (MTCO <sub>2</sub> e/yr)	Performance Indicator
2010 Reductions (MTCO <sub>2</sub> e):	-1,190	Annual ridership counts
2020 Reductions (MTCO <sub>2</sub> e):	-1,100	Annual ridership counts
2035 Reductions (MTCO <sub>2</sub> e):	-1,230	Annual ridership counts

## Methodology:

Increased access to local and regional transit systems like Vallejo Transit, Baylink Ferry, and shuttles to and from BART stations will reduce VMT by .5%. 2010 GHG reductions are based on increased ridership on local transit routes between 2008 and 2010 based on passenger miles on the Vallejo transit system reported to the National Transit Database.

## Sources:

Federal Transportation Administration. 2009. National Transit Database: City of Vallejo Transportation Program Profile. [http://www.ntdprogram.gov/ntdprogram/pubs/profiles/2008/agency\\_profiles/9028.pdf](http://www.ntdprogram.gov/ntdprogram/pubs/profiles/2008/agency_profiles/9028.pdf).

Solano Transportation Authority. 2007a. Countywide Ridership Study, Baylink Ferry <http://www.sta.dst.ca.us/pdfs/SNCI/Transit%20Ridership%20Study/Baylink%20report%203-26.pdf>.

Solano Transportation Authority. 2007b. Countywide Ridership Study, Vallejo Transit Inter-City Lines <http://www.sta-snci.com/pdfs/SNCI/Transit%20Ridership%20Study/Vallejo%20report%20intercity%203-26.pdf>.

Solano Transportation Authority. 2007c. Countywide Ridership Study, Vallejo Transit Local Lines. <http://www.sta.dst.ca.us/pdfs/SNCI/Transit%20Ridership%20Study/Vallejo%20report%20local%20only%203-26.pdf>.

## TDM-6 FOOD SYSTEMS

Support convenient access to neighborhood-serving grocery stores and community gardens.

## GHG Reduction Technical Appendix

### Action Items:

- Encourage the distribution of grocery stores that provide fresh and local foods with convenient access from all residential neighborhoods.
- Improve the distribution, frequency, and attendance of farmers markets in Vallejo.
- Collaborate with community-based organizations in support of community gardens on applicable sites throughout the city.
- Revise zoning standards as necessary to allow small neighborhood markets in appropriate areas.
- Add an additional week-day Farmer's Market in Vallejo.

Target Year	GHG Reduction (MTCO <sub>2e</sub> /yr)	Performance Indicator
2010 Reductions (MTCO <sub>2e</sub> ):	Supporting Measure	Percentage of residents within 1/2 mile of grocery store
2020 Reductions (MTCO <sub>2e</sub> ):	Supporting Measure	Percentage of residents within 1/2 mile of grocery store
2035 Reductions (MTCO <sub>2e</sub> ):	Supporting Measure	Percentage of residents within 1/2 mile of grocery store

## TDM-7 COMMUTE BEHAVIOR

Reduce emissions from commute travel to and from schools and workplaces.

### Action Items:

- Encourage a variety of transportation system demand management techniques for new development, including variable work hours and telecommuting.
- Support the establishment and participation in Safe Routes to Schools and similar infrastructure and educational programs that enable safe passage of children and reduce vehicle trips to local schools.
- Collaborate with the Solano Transportation Authority (STA) and Solano County to update the rideshare matching system to include the use of social networking and smart phone platforms and encourage greater use of existing park-and-ride lots.
- Collaborate with STA and local employers to support guaranteed ride home programs including preferential parking spaces, employer-assisted ride-matching databases, recognition programs, and

# GHG Reduction Technical Appendix

APPENDIX C

other incentives.

- Participate in and contribute to regional programs to address Bay Area commute alternatives and commute efficiency.

Target Year	GHG Reduction (MTCO <sub>2</sub> e/yr)	Performance Indicator
2010 Reductions (MTCO <sub>2</sub> e):	-140	Participation rates in SRTS and rideshare programs
2020 Reductions (MTCO <sub>2</sub> e):	-2,050	Participation rates in SRTS and rideshare programs
2035 Reductions (MTCO <sub>2</sub> e):	-2,390	Participation rates in SRTS and rideshare programs

## Methodology:

Additional participation in commute trip reduction programs and expansion of Safe Routes To School programs will result in a 1% reduction in VMT.

## Sources:

Solano County Transit Authority. 2008. Solano County Safe Routes to School Plan  
<http://www.sta.dst.ca.us/pdfs/Programs/SR2S/final/STA-SR2S%20Final%20Plan%2002-13-2008%20-%20WEB.pdf>.

U.S. Census Bureau. 2008. American Communities Survey: City of Vallejo.  
[http://factfinder.census.gov/servlet/ADPTTable?\\_bm=y&-geo\\_id=16000US0681666&-qr\\_name=ACS\\_2008\\_3YR\\_G00\\_DP3YR3&-context=adp&-ds\\_name=&-tree\\_id=3308&-\\_lang=en&-redoLog=false&-format=](http://factfinder.census.gov/servlet/ADPTTable?_bm=y&-geo_id=16000US0681666&-qr_name=ACS_2008_3YR_G00_DP3YR3&-context=adp&-ds_name=&-tree_id=3308&-_lang=en&-redoLog=false&-format=)

## TDM-8 JOBS/HOUSING BALANCE

Plan for an improved jobs/housing balance in order to reduce the need for long-distance travel from residences to places of work.

## Action Items:

- Update the City General Plan and corresponding regulations to support additional jobs and economic revitalization that improves Vallejo's jobs/housing balance.
- Support the retention and expansion of local anchor and growth industries including Kaiser and Sutter

# GHG Reduction Technical Appendix

hospitals, as well as Touro University on Mare Island and the California Maritime Academy.

- Review land-use plans and regulations and revise as needed to support additional live/work opportunities and home occupations, provided they are compatible with the existing neighborhood.

Target Year	GHG Reduction (MTCO <sub>2</sub> e/yr)	Performance Indicator
2010 Reductions (MTCO <sub>2</sub> e):	-80	Jobs to housing ratio; number of affordable housing units
2020 Reductions (MTCO <sub>2</sub> e):	-1,820	Jobs to housing ratio; number of affordable housing units
2035 Reductions (MTCO <sub>2</sub> e):	-3,950	Jobs to housing ratio; number of affordable housing units

## Methodology:

An improved jobs/housing balance and increased affordable housing will result in a decrease in VMT as residents of Vallejo can reduce work-related trips by living closer to job opportunities.

## Sources:

California Air Pollution Control Officers Association. 2010. Quantifying Greenhouse Gas Mitigation Measures.

Nelson/Nygaard, Creating Low-Traffic Developments: Adjusting Site-Level Vehicle Trip Generation Using URBEMIS, 2005. pg. 12.

Sacramento Metropolitan Air Quality Management District. 2007. Recommended Guidance for Land Use Emission Reductions, Version 2.4.

Urbemis 2007 Version 9.2.4. Rimpo and Associates.

## OT-1 EFFICIENT AND ALTERNATIVE FUEL VEHICLES

Support the expanded use of efficient and alternative fuel vehicles.

### Action Items:

- Support continued use of high-occupancy vehicle (HOV) lanes by fuel-efficient and alternative fuel vehicles designated as zero or partial zero emission vehicles (ZEV or PZEV) by the California Air Resources Board through adoption of Climate Action Plan policies and participation on the Metropolitan



# GHG Reduction Technical Appendix

APPENDIX C

Transportation Commission and other regional agency committees

- Revise parking requirements for public and new commercial developments to include designated stalls for low-emitting, fuel-efficient vehicles and carpool/vanpool vehicles for a minimum of 8% of total parking capacity and to pre-wire stalls for future electric vehicle charging stations for 2% of total parking capacity.
- Encourage new gas stations and automotive uses to include biodiesel facilities and/or offer biodiesel retrofits to diesel vehicles.
- Consider creating refueling stations to provide biodiesel fuel, compressed natural gas, or liquefied natural gas.

Target Year	GHG Reduction (MTCO <sub>2</sub> e/yr)	Performance Indicator
2010 Reductions (MTCO <sub>2</sub> e):	0	Number of clean vehicle parking stalls; hybrid vehicle sales; annual bridge crossings
2020 Reductions (MTCO <sub>2</sub> e):	-17,6090	Number of clean vehicle parking stalls; hybrid vehicle sales; annual bridge crossings
2035 Reductions (MTCO <sub>2</sub> e):	-18,380	Number of clean vehicle parking stalls; hybrid vehicle sales; annual bridge crossings

## Methodology:

This measure incorporates the fuel savings and VMT reductions associated with increases in hybrid and alternative fuel vehicles uses as well as reduced intercity travel through increased toll prices and the installation of HOV (high-occupancy vehicle) lanes on nearby highways.

## Sources:

California Air Pollution Control Officers Association. 2010. Quantifying and Mitigating Greenhouse Gas Emissions.

California Building Standards Commission. 2010. 2010 California Green Building Standards Code; California Code of Regulations Title 24, Part 11.

California Department of Transportation. 2009. High Occupancy Vehicle Report. [http://www.dot.ca.gov/dist4/highwayops/docs/hov\\_report\\_2009.pdf](http://www.dot.ca.gov/dist4/highwayops/docs/hov_report_2009.pdf).

Department of Transportation. 2001. National Household Travel Survey. Washington, D.C.

Idaho National Laboratory. 2006. Full Size Electric Vehicles: Advanced Vehicle Testing Reports.

Metropolitan Transportation Commission. 2010. Transportation News, Commission Approve Toll Hike Package for Earthquake Safety. [http://www.mtc.ca.gov/news/info/toll\\_increase.htm](http://www.mtc.ca.gov/news/info/toll_increase.htm).

## OT-2 CAR SHARING

Facilitate a car-sharing network in Vallejo.

### Action Items:

- Facilitate and encourage at least one car-sharing company, such as Zip Car and City Car Share, to include Vallejo in its service area by 2020.
- Investigate the possibility of reducing the City's vehicle fleet by using car-sharing vehicles for appropriate City uses by 2020.

Target Year	GHG Reduction (MTCO <sub>2</sub> e/yr)	Performance Indicator
2010 Reductions (MTCO <sub>2</sub> e):	0	N/A
2020 Reductions (MTCO <sub>2</sub> e):	-740	1% of population participating in car-sharing program
2035 Reductions (MTCO <sub>2</sub> e):	-2,130	3% of population participating in car-sharing program

### Methodology:

Participation in car-sharing programs in a typical region is 10–20% of residents living in neighborhoods suitable for car sharing, and perhaps 3–5% of those residents would car share rather than own a private vehicle if the service were available. VMT reduction per participant is estimated at 50% of previous annual vehicle use, of which approximately 50% is assumed to occur in Vallejo.

### Sources:

California Air Resources Board. 2007. Emissions Factor (EMFAC) 2007 Software.

Victoria Transportation Policy Institute. 2011. <http://www.vtpi.org/index.php>

## OT-3 ANTI-IDLING AND TRAFFIC CALMING

Support anti-idling and traffic calming infrastructure and enforcement.

### Action Items:

- Synchronize, improve, and construct traffic signal/road improvements that reduce vehicle idling.
- Work with the Vallejo Police Department to increase enforcement of state idling restrictions for heavy-duty vehicles.
- -Encourage local schools to implement an anti-idling campaign at pick-up and drop-off areas.

Target Year	GHG Reduction (MTCO <sub>2</sub> e/yr)	Performance Indicator
2010 Reductions (MTCO <sub>2</sub> e):	0	N/A
2020 Reductions (MTCO <sub>2</sub> e):	-2,010	10% decrease in trip time due to synchronization
2035 Reductions (MTCO <sub>2</sub> e):	-1,870	10% decrease in trip time due to synchronization

### Methodology:

Vehicles consume .5 gallon of gasoline fuel for every hour of idling. Conversion to equivalent VMT completed using Solano County MPG from EMFAC2007 - 18.1 for gasoline

### Sources:

Bloomekatz, Ari B. October 8, 2009. Los Angeles Times, Metro Blog, 82% of L.A.'s signal-controlled intersections are now synchronized, mayor will announce. Retrieved from:  
<http://latimesblogs.latimes.com/lanow/2009/10/82-of-las-streets-now-covered-by-synchronized-traffic-lights.html>

## OT-4 ZERO EMISSION VEHICLE STATIONS

Provide electric vehicle charging stations.

**Action Items:**

- Install additional electric vehicle charging stations at municipal facilities and appropriate on-street locations for public use.
- Coordinate with regional agencies to install charging stations in high traffic areas through grant-funded programs encouraging electric vehicle use.
- Use small- and large-scale solar panels to power or supplement charging stations.

Target Year	GHG Reduction (MTCO <sub>2</sub> e/yr)	Performance Indicator
2010 Reductions (MTCO <sub>2</sub> e):	0	N/A
2020 Reductions (MTCO <sub>2</sub> e):	-80	100 charging stations installed
2035 Reductions (MTCO <sub>2</sub> e):	-160	250 charging stations installed

**Methodology:**

The installation of vehicle charging stations throughout the city will encourage the purchase of electric vehicles for use by residents and businesses. GHG reductions from increased electric vehicle use include the fuel emissions reduced and the increased electricity used to charge the vehicles.

**Sources:**

Idaho National Laboratory. 2006. Full Size Electric Vehicles. <http://avt.inel.gov>.

National Household Travel Survey. 2001.

U.S. Department of Energy. 2010. <http://fueleconomy.gov>.

**W-1 WATER CONSERVATION EFFORTS**

Promote and require water conservation through outreach and pricing.

**Action Items:**

- Continue to provide water customers with information on conservation techniques, services, devices, and rebates by posting information at [vallejowater.org](http://vallejowater.org) or through other outreach methods.
- Continue to enforce the City's Wasteful Water Use Prohibition Ordinance.

# GHG Reduction Technical Appendix

APPENDIX C

Target Year	GHG Reduction (MTCO <sub>2</sub> e/yr)	Performance Indicator
2010 Reductions (MTCO <sub>2</sub> e):	0	N/A
2020 Reductions (MTCO <sub>2</sub> e):	-490	8% reduction in water use
2035 Reductions (MTCO <sub>2</sub> e):	-890	15% reduction in water use

## Methodology:

Additional outreach and enforcement of the City's wasteful water use ordinance will result in an 8% reduction in commercial and residential water use by 2020. Decreased water use will result in lower volumes of water and therefore lower electricity use to deliver, treat, and discharge water. This measure will result in a decrease in use of over 470 million gallons of water annually.

## Sources:

City of Vallejo. 2009. Proposed Water Rate Increase FY 2009/10 – FY 2013/14.  
<http://www.ci.vallejo.ca.us/uploads/568/Common%20Public%20Questions%20&%20Answers%202009.pdf>.

City of Vallejo. 2010. City of Vallejo Municipal Code: Vallejo Wasteful Water Use Ordinance.  
[http://search.municode.com/html/16106/level3/TIT11WA\\_IIMIWARE\\_CH11.54WAWAUSPROR.html](http://search.municode.com/html/16106/level3/TIT11WA_IIMIWARE_CH11.54WAWAUSPROR.html).

## W-2 DEVELOPMENT STANDARDS FOR WATER CONSERVATION

Require water conservation in all new buildings and landscapes.

### Action Items:

- Per the minimum requirements of the 2010 CALGreen Code, ensure that all new non-residential buildings larger than 50,000 square feet install individual water meters for each tenant space projected to consume more than 100 gallons per day..
- Per the minimum requirements of the 2010 CALGreen Code, ensure that new non-residential facilities with 1,000 to 5,000 square feet of irrigated landscaped space provide an additional water meter or submeter for landscaping uses.
- Revise development standards to support the use of greywater, recycled water, and rainwater catchment systems in all zones.

## GHG Reduction Technical Appendix

- Per the voluntary requirements of the 2010 CALGreen Code, encourage newly constructed development to treat at least 40% of the average annual rainfall on-site through low impact development strategies.
- Per the minimum requirements of the 2010 CALGreen Code, require a minimum of 20% of the total parking, walkway, and porch area surfaces serving single-family and multi-family residential buildings under 4 units to be permeable to facilitate on-site retention of water and reduce water runoff.

Target Year	GHG Reduction (MTCO <sub>2</sub> e/yr)	Performance Indicator
2010 Reductions (MTCO <sub>2</sub> e):	0	N/A
2020 Reductions (MTCO <sub>2</sub> e):	-40	20% reduction in indoor water use
2035 Reductions (MTCO <sub>2</sub> e):	-90	20% reduction in indoor water use

### Methodology:

Decreased water use from new buildings will result in lower volumes of water and therefore lower electricity use to deliver, treat, and discharge water.

### Sources:

California Building Standards Commission. 2010. California Code of Regulations, Title 24: Part 11: California Green Building Standards Code.

[http://www.documents.dgs.ca.gov/bsc/CALGreen/2010\\_CA\\_Green\\_Bldg.pdf](http://www.documents.dgs.ca.gov/bsc/CALGreen/2010_CA_Green_Bldg.pdf).

## W-3 RECYCLING AND COMPOST EFFORTS

Support waste diversion through composting and recycling programs.

### Action Items:

- Collaborate with CalRecycle and VALCORE Community Recycling to continue to host recycling and composting workshops and to disseminate information.
- Provide links to information on composting and VALCORE composting services and classes on the City's website and at other appropriate venues.
- Prepare a list of GHG-reducing best practices for material management to be considered during the solid waste franchise selection process and applicable City permit processes for major development projects.

# GHG Reduction Technical Appendix

APPENDIX C

Target Year	GHG Reduction (MTCO <sub>2</sub> e/yr)	Performance Indicator
2010 Reductions (MTCO <sub>2</sub> e):	-3,070	60% diversion rate
2020 Reductions (MTCO <sub>2</sub> e):	-8,390	75% diversion rate
2035 Reductions (MTCO <sub>2</sub> e):	-14,160	85% diversion rate

## Methodology:

Increased diversion rates through the expansion of recycling and composting opportunities will result in decreased amounts of waste being sent to landfills and therefore a decrease in waste-related GHG emissions.

## Sources:

Cal Recycle. 2011. Jurisdiction Profile for City of Vallejo. <http://www.calrecycle.ca.gov/profiles/Juris/JurProfile1.asp?RG=C&JURID=554&JUR=Vallejo>.

## W-4 DEVELOPMENT STANDARDS FOR RECYCLING AND COMPOSTING

Require waste diversion and the use of recycled materials in new development.

## Action Items:

- Propose adoption of a Construction/Demolition Waste Reuse and Recycling Ordinance that requires the diversion of at least 50% of construction and demolition waste from landfills.
- Support the development of additional markets for recycled content products by requiring new developments to include recycled content materials at a minimum of 10% of total materials.

Target Year	GHG Reduction (MTCO <sub>2</sub> e/yr)	Performance Indicator
2010 Reductions (MTCO <sub>2</sub> e):	Supporting Measure	50% diversion rate
2020 Reductions (MTCO <sub>2</sub> e):	Supporting Measure	50% diversion rate
2035 Reductions (MTCO <sub>2</sub> e):	Supporting Measure	50% diversion rate

**Methodology:**

This measure will increase the minimum amount of construction and demolition waste to be diverted by 15%.

**Sources:**

California Integrated Waste Management Board. 2004. Statewide Waste Characterization Study.

**OR-1 LAWN & GARDEN EQUIPMENT**

Encourage the use of electrified and higher-efficiency lawn and garden equipment.

**Action Items:**

- Support BAAQMD's efforts to re-establish a voluntary exchange program for residential lawnmowers and backpack-style leaf blowers.
- Require new buildings to provide electrical outlets on the exterior in an accessible location to charge electric-powered lawn and garden equipment.
- Encourage the replacement of high-maintenance landscapes (like grass turf) with native vegetation to reduce the need for gas-powered lawn and garden equipment.

Target Year	GHG Reduction (MTCO <sub>2</sub> e/yr)	Performance Indicator
2010 Reductions (MTCO <sub>2</sub> e):	0	N/A
2020 Reductions (MTCO <sub>2</sub> e):	-30	Replace 25% of gas leaf blowers; replace 15% of gas lawnmowers
2035 Reductions (MTCO <sub>2</sub> e):	-50	Replace 50% of gas leaf blowers; replace 25% of gas lawnmowers

**Methodology:**

This measure assumes that 25% of gasoline-powered leaf blowers and 15% of gas-powered lawnmowers will be replaced with all-electric equipment by 2020. CARB Off-Road Software provides total equipment population and fuel consumption by equipment type for Solano County, which was used to determine average emissions per piece of equipment in Vallejo.



**Sources:**

Bay Area Air Quality Management District. 2010. History of the Air District: 1995-200.

<http://www.baaqmd.gov/Divisions/Communications-and-Outreach/News-Media-and-Features/History-of-Air-District-2005/1995--2000.aspx>

California Air Resources Board. 2007. Off-Road Software.

## OR-2 CONSTRUCTION EQUIPMENT

Reduce emissions from heavy-duty construction equipment by limiting idling and utilizing cleaner fuels, equipment, and vehicles.

**Action Items:**

- Idling times will be minimized either by shutting equipment off when not in use or reducing the maximum idling time to 5 minutes (as required by the California airborne toxics control measure Title 13, Section 2485 of California Code of Regulations [CCR]), or less. Clear signage will be provided at all access points to remind construction workers of idling restrictions.
- Construction equipment must be maintained per manufacturer's specifications.
- Planning and Building staff will work with project applicants to limit GHG emissions from construction equipment by selecting one of the following measures, at a minimum, as appropriate to the construction project:
  - Substitute electrified equipment for diesel- and gasoline-powered equipment where practical.
  - Use alternatively fueled construction equipment on-site, where feasible, such as compressed natural gas (CNG), liquefied natural gas (LNG), propane, or biodiesel.
  - Avoid the use on on-site generators by connecting to grid electricity or utilizing solar-powered equipment.
  - d. Limit heavy-duty equipment idling time to a period of 3 minutes or less, exceeding CARB regulation minimum requirements of 5 minutes.

Target Year	GHG Reduction (MTCO <sub>2</sub> e/yr)	Performance Indicator
2010 Reductions (MTCO <sub>2</sub> e):	Supporting Measure	Percentage of construction projects

		using alternative fuel equipment
2020 Reductions (MTCO <sub>2e</sub> ):	Supporting Measure	Percentage of construction projects using alternative fuel equipment
2035 Reductions (MTCO <sub>2e</sub> ):	Supporting Measure	Percentage of construction projects using alternative fuel equipment

## A-1 REGIONAL COORDINATION

Participate in regional efforts to analyze and prepare for the impacts of climate change in the Bay Area.

### Action Items:

- Join regional adaptation and resiliency task forces such as that of the San Francisco Bay Area Conservation and Development Commission (BCDC) and the Joint Policy Committee (JPC).
- Appoint a staff liaison to attend and participate in regional meetings focusing on adaptation and resilience and to report to staff on a regular basis.

Target Year	GHG Reduction (MTCO <sub>2e</sub> /yr)	Performance Indicator
2010 Reductions (MTCO <sub>2e</sub> ):	Supporting Measure	N/A
2020 Reductions (MTCO <sub>2e</sub> ):	Supporting Measure	N/A
2035 Reductions (MTCO <sub>2e</sub> ):	Supporting Measure	N/A

## A-2 PREPAREDNESS

Ensure that Vallejo is prepared for potential environmental risks and hazards related to climate change, with a special emphasis on vulnerable populations.

### Action Items:

- Regularly train, inform, and solicit feedback from the City's Fire and Police departments on potential climate change risks and hazards.
- Revise City Hazard Mitigation Plans and other applicable documents such as long-range capital improvement plans to address climate change issues and best practices during required updates and as funding permits.
- Monitor climate change science and policy, and regularly inform stakeholders of new information.

# GHG Reduction Technical Appendix

APPENDIX C

Target Year	GHG Reduction (MTCO <sub>2</sub> e/yr)	Performance Indicator
2010 Reductions (MTCO <sub>2</sub> e):	Supporting Measure	N/A
2020 Reductions (MTCO <sub>2</sub> e):	Supporting Measure	N/A
2035 Reductions (MTCO <sub>2</sub> e):	Supporting Measure	N/A

## A-3 ADAPTATION MAINSTREAMING

Integrate potential climate change impacts into local planning documents and processes.

### Action Items:

- In development review, analyze and disclose possible impacts of climate change on the project or plan area, with an emphasis on sea level rise.
- Integrate climate change adaptation into future updates of the Zoning Code, Building Code, General Plan, and other related documents.

Target Year	GHG Reduction (MTCO <sub>2</sub> e/yr)	Performance Indicator
2010 Reductions (MTCO <sub>2</sub> e):	Supporting Measure	N/A
2020 Reductions (MTCO <sub>2</sub> e):	Supporting Measure	N/A
2035 Reductions (MTCO <sub>2</sub> e):	Supporting Measure	N/A



# APPENDIX D

City of Vallejo Climate Action Plan

## Compliance Checklist for New Development

## Compliance Checklist for New Development

APPENDIX D

### COMPLIANCE CHECKLIST FOR NEW DEVELOPMENT CITY OF VALLEJO QUALIFIED GREENHOUSE GAS REDUCTION PLAN

The following table will be used to determine compliance with the City's Climate Action Plan (CAP), a Qualified Greenhouse Gas Reduction Plan according to the Bay Area Air Quality Management District (BAAQMD) California Environmental Quality Act (CEQA) guidelines. A new development may use the CAP as a performance based threshold of significance for greenhouse gas emissions by demonstrating compliance with the CAP's goals, measures, and actions. The checklist below will aid in this endeavor.

The checklist will be updated regularly as the CAP's goals, policies and actions are implemented. The CAP policy language will be replaced by actual municipal code sections, where applicable.

Topic	Policy	City Requirements	Project Requirements	Compliance	Discussion
<b>Energy Efficiency</b>					
Building Standards	Require all new development to meet minimum energy efficiency and green building requirements, as amended and encourage new development to exceed Title 24 Energy Efficiency and CALGreen Standards.	Adopt the California Title 24 minimum requirements and encourage new construction and major remodels to adhere to a Tier 1 or Tier 2 standard of the CALGreen Code.  Require newly constructed buildings and recommend that remodels over 50% and tenant improvements demonstrate compliance with the mandatory CALGreen Code requirements by completing a green building checklist when submitting a request for building permits.  Consider requiring new development to comply with the Tier 1 requirements of CALGreen, Part 11 of the California Building Standards Code. This optional measure may be necessary to address any shortfall in attaining reduction objectives.	Comply with Title 24 minimum requirements and consider adhering to the Tier 1 or Tier 2 standards of the CALGreen Code for Energy Efficiency.  Complete CAP checklist.	<input type="checkbox"/> Complies <input type="checkbox"/> Complies with Intent of Project Requirement <input type="checkbox"/> Not Applicable <input type="checkbox"/> Does Not Comply	
Smart Meters	Increase the community's awareness and utilization of real-time energy consumption data available through PG&E's SmartMeter program.	Require newly constructed buildings and recommend that major remodels install indoor real-time energy monitors.  Connect businesses and residents with rebate programs that give priority to appliances with smart grid technology.	Install indoor real-time energy monitor in each unit or tenant space.  Provide information to prospective buyers or tenants on available rebates for appliances with smart grid enabled technology	<input type="checkbox"/> Complies <input type="checkbox"/> Complies with Intent of Project Requirement <input type="checkbox"/> Not Applicable <input type="checkbox"/> Does Not Comply	
Cool Roofs and Pavements	Increase tree planting and the use of cool roofs and cool pavement materials to reduce the urban heat island effect and corresponding energy consumption. Implement tree replacement policy for projects where tree removal is necessary.	Actively inspect and enforce state requirements for cool roofs on residential and nonresidential roofing projects. Require new buildings to meet Title 24 and recommend that new buildings meet CALGreen Tier 1 requirements for cool roofs, which require a minimum solar reflectance index (SRI) of 10 for steep slope roofs and 64 for low slope roofs.  Establish standards for new development and major remodels to reduce exterior heat gain for 50% of non-roof impervious site surfaces (roads, sidewalks, courtyards, parking lots, driveways) through one or more of the following mechanisms: <ul style="list-style-type: none"> <li>▪ Achieve 50% paved surface shading within five to ten years by planting trees and other vegetation and/or installing solar panels or shading structures above parking.</li> </ul>	Comply with minimum Title 24 requirements for cool roofs to have a minimum SRI of 10 for steep slope and 64 for low slope roofs on residential and nonresidential projects.  Reduce exterior heat gain by planting vegetation, installing solar panel shade structures, or utilizing paving materials with a minimum SRI of 29 for at least 50% of non-roof impervious site surfaces.	<input type="checkbox"/> Complies <input type="checkbox"/> Complies with Intent of Project Requirement <input type="checkbox"/> Not Applicable <input type="checkbox"/> Does Not Comply	
CLIMATE ACTION PLAN					

# Compliance Checklist for New Development

APPENDIX D

Topic	City Requirements	Project Requirements	Compliance	Discussion
	<p>Use paving materials with an SRI of at least 29 for all surfaces.</p> <p>Maintain and expand Vallejo's urban forest, including street trees and trees on private property.</p> <p>For public improvements and public projects, require the use of high albedo paving material for sidewalks, roads, crosswalks, parking lots, and driveways.</p>	<p>Install and maintain street trees in compliance with current development standards</p> <p>Utilize high albedo paving material when required to install or renovate sidewalks, roads, crosswalks, parking lots, and driveways</p>		
<b>Renewable Energy</b>				
Renewable Energy Installations	<p>Support the installation of small-scale renewable energy systems including solar photovoltaic, solar thermal, and wind, river current, and tidal energy conversion systems.</p> <p>Encourage new homes and businesses to be pre-wired and pre-plumbed for solar and solar thermal installations.</p>	<p>Pre-wire and pre-plumb new residential and commercial buildings for solar and solar thermal installations.</p>	<input type="checkbox"/> Complies <input type="checkbox"/> Complies with Intent of Project Requirement <input type="checkbox"/> Not Applicable <input type="checkbox"/> Does Not Comply	
<b>Transportation &amp; Land Use</b>				
Promote mixed-use, higher-density development near transit nodes.	<p>Implement elements in the Downtown Specific Plan that encourage pedestrian-oriented plazas, walkways, bike trails, bike lanes, and street furniture and connections to other community areas. Promote pedestrian convenience and recreational opportunities through development conditions requiring sidewalks, walking paths, or hiking trails connecting various land uses and including safety amenities such as lighting and signage.</p> <p>Implement elements in the Downtown Specific Plan that promote mixed-use development and provide commercial services such as day care, restaurants, banks, and stores near to employment centers, where feasible.</p>	<p>Include sidewalks, walking paths, or hiking trails connecting various land uses and including safety amenities such as lighting and signage throughout the project site for projects with the Downtown Specific Plan.</p> <p>Incorporate commercial services such as day care, restaurants, banks, and stores near employment centers where feasible in mixed use projects for projects within the Downtown Specific Plan.</p>	<input type="checkbox"/> Complies <input type="checkbox"/> Complies with Intent of Project Requirement <input type="checkbox"/> Not Applicable <input type="checkbox"/> Does Not Comply	
Expand and link the network of pedestrian and bicycle paths and facilities through preparation of a Bicycle and Pedestrian Master Plan, with the goal of increasing the bicycle and pedestrian mode share 20% by 2035.	<p>Revise zoning standards to require the provision of bicycle support facilities (lockers, shower rooms, etc.) for appropriate development at a rate of 1 changing room and shower per 200 occupants.</p>	<p>Provide bicycle support facilities at a rate of 1 changing room and shower per 200 occupants within non-residential developments.</p>	<input type="checkbox"/> Complies <input type="checkbox"/> Complies with Intent of Project Requirement <input type="checkbox"/> Not Applicable <input type="checkbox"/> Does Not Comply	



# Compliance Checklist for New Development

APPENDIX D

Topic	City Requirements	Project Requirements	Compliance	Discussion
<p>Revise parking requirements for new commercial and multi-family residential projects to provide bike racks for 5% of the building's projected visitors within 200 feet of the building's entrance for commercial projects and one long-term bicycle storage space per two multi-family units.</p> <p>Allow up to a 15% reduction in required private vehicle parking spaces in new commercial and multi-family residential projects if justified in an approved trip reduction plan.</p> <p>Encourage shared parking programs in mixed-use and transit-oriented development areas.</p> <p>Design parking lots, where feasible, to include clearly marked and shaded pedestrian pathways between transit facilities and building entrances.</p>	<p>Revise parking requirements for new commercial and multi-family residential projects to provide bike racks for 5% of the building's projected visitors within 200 feet of the building's entrance for commercial projects and one long-term bicycle storage space per two multi-family units.</p> <p>Allow up to a 15% reduction in required private vehicle parking spaces in new commercial and multi-family residential projects if justified in an approved trip reduction plan.</p> <p>Encourage shared parking programs in mixed-use and transit-oriented development areas.</p> <p>Design parking lots, where feasible, to include clearly marked and shaded pedestrian pathways between transit facilities and building entrances.</p>	<p>Provide bike racks for 5% of the projected building occupants within 200 feet of the building entrance and one long-term bicycle storage space per two multi-family units.</p> <p>Consider reducing the number of required vehicle parking spaces by up to 15% through the development of an approved trip reduction program.</p> <p>Consider utilizing shared parking in mixed-use and transit-oriented developments.</p> <p>Design parking lots, where feasible, to include clearly marked and shaded pedestrian pathways between transit facilities and building entrances.</p>	<p><input type="checkbox"/> Complies</p> <p><input type="checkbox"/> Complies with Intent of Project Requirement</p> <p><input type="checkbox"/> Not Applicable</p> <p><input type="checkbox"/> Does Not Comply</p>	
		<p>Encourage a variety of transportation system demand management techniques for new development, including variable work hours and telecommuting.</p> <p>Support the establishment and participation in Safe Routes to Schools and similar infrastructure and educational programs that enable safe passage of children and reduce vehicle trips to local schools.</p> <p>Collaborate with the Solano Transportation Authority (STA) and Solano County to update the rideshare matching system to include the use of social networking and smart phone platforms and encourage greater use of existing park-and-ride lots.</p> <p>Collaborate with STA and local employers to support guaranteed ride home programs including preferential parking spaces, employer-assisted ride-matching databases, recognition programs, and other incentives.</p>	<p>Implement applicable transportation demand management programs and techniques.</p> <p>Install infrastructure within and adjacent to the project site to ensure the safe passage of children to and from school.</p> <p>Encourage employers and employees to utilize the Solano Transit Authority's rideshare matching system.</p> <p>Encourage employers and employees to participate in STA's ridesharing and support services.</p>	<p><input type="checkbox"/> Complies</p> <p><input type="checkbox"/> Complies with Intent of Project Requirement</p> <p><input type="checkbox"/> Not Applicable</p> <p><input type="checkbox"/> Does Not Comply</p>
<p>Plan for an improved jobs/housing balance in order to reduce the need for long-distance travel from residences to places of work.</p>	<p>Update the City General Plan and corresponding regulations to support additional jobs and economic revitalization that improves Vallejo's jobs/housing balance.</p> <p>Review land-use plans and regulations and revise as needed to support additional live/work opportunities and home occupations, provided they are compatible with the existing neighborhood.</p>	<p>Provide jobs and economic revitalization that improves Vallejo's jobs/housing balance.</p> <p>Provide live/work opportunities when compatible within existing neighborhood.</p>	<p><input type="checkbox"/> Complies</p> <p><input type="checkbox"/> Complies with Intent of Project Requirement</p> <p><input type="checkbox"/> Not Applicable</p> <p><input type="checkbox"/> Does Not Comply</p>	

# Compliance Checklist for New Development

Topic	Policy	City Requirements	Project Requirements	Compliance	Discussion
Efficient and Alternative Fuel Vehicles	Support the expanded use of efficient and alternative fuel vehicles.	<p>Revise parking requirements for public and newly constructed commercial developments to include designated stalls for low-emitting, fuel-efficient vehicles and carpool/vanpool vehicles for a minimum of 8% of total parking capacity and to pre-wire stalls for future electric vehicle charging stations for 2% of total parking capacity.</p> <p>Encourage new gas stations and automotive uses to include biodiesel facilities and/or offer biodiesel retrofits to diesel vehicles.</p>	<p>Include designated stalls for low-emitting, fuel-efficient vehicles and carpool/vanpool vehicles for a minimum of 8% of total non-residential parking capacity and pre-wire stalls for future electric vehicle charging stations for 2% of total parking capacity.</p> <p>Consider including alternative fuel stations within the project.</p>	<input type="checkbox"/> Complies <input type="checkbox"/> Complies with Intent of Project Requirement <input type="checkbox"/> Not Applicable <input type="checkbox"/> Does Not Comply	
	<h3 style="text-align: center;">Water Conservation</h3>				
Development Standards for Water Conservation	Require water conservation in all new buildings and landscapes.	<p>Per the minimum requirements of the 2010 CALGreen Code, ensure that all new non-residential buildings larger than 50,000 square feet install individual water meters for each tenant space projected to consume more than 100 gallons per day.</p> <p>Per the minimum requirements of the 2010 CALGreen Code, ensure that all new non-residential facilities with 1,000 to 5,000 square feet of irrigated landscaped space provide an additional water meter or sub-meter for landscaping uses.</p> <p>Revise development standards to support the use of greywater, recycled water, and rainwater catchment systems in all zones.</p>	<p>Install individual water meters for each tenant space projected to consume more than 100 gallons per day in all non-residential buildings larger than 50,000 square feet.</p> <p>Provide an additional water meter or sub-meter for landscaping uses for all new non-residential facilities with 1,000 to 5,000 square feet of irrigated landscaped space.</p> <p>Consider installing greywater, recycled water, and rainwater catchment systems if feasible.</p>	<input type="checkbox"/> Complies <input type="checkbox"/> Complies with Intent of Project Requirement <input type="checkbox"/> Not Applicable <input type="checkbox"/> Does Not Comply	
	Require waste diversion and the use of recycled materials in new development.	<p>Per the voluntary requirements of the 2010 CALGreen Code, encourage newly constructed development to treat at least 40% of the average annual rainfall on-site through low impact development strategies.</p> <p>Per the minimum requirements of the 2010 CALGreen Code, require a minimum of 20% of the total parking, walkway, and porch area surfaces serving single-family and multi-family residential buildings under 4 units to be permeable to facilitate on-site retention of water and reduce water run-off.</p>	<p>Implement low impact development strategies in new non-residential projects to treat a minimum of 40% of the average annual rainfall on-site.</p> <p>Facilitate on-site retention of water and reduce water run-off by installing permeable surfaces for a minimum of 20% of the total parking, walkway, and porch area surfaces serving single-family and multi-family residential buildings under 4 units.</p>	<input type="checkbox"/> Complies <input type="checkbox"/> Complies with Intent of Project Requirement <input type="checkbox"/> Not Applicable <input type="checkbox"/> Does Not Comply	
	Require waste diversion and the use of recycled materials in new development.	<p>Continue to update the City's Construction/Demolition Waste Reuse and Recycling Ordinance as higher diversion rates become feasible, necessary, or required.</p> <p>Support the development of additional markets for recycled content products by requiring new developments to include recycled content materials at a minimum of 10% of total materials.</p>	<p>Comply with the City's Construction/Demolition Waste Reuse and Recycling Ordinance.</p> <p>Incorporate recycled content materials for a minimum of 10% of total materials.</p>	<input type="checkbox"/> Complies <input type="checkbox"/> Complies with Intent of Project Requirement <input type="checkbox"/> Not Applicable <input type="checkbox"/> Does Not Comply	
	Development Standards for Recycling and Composting				

### Equipment

Lawn & Garden	Encourage the use of electrified and higher-	Require new buildings to provide electrical outlets on the exterior in an	Install outdoor electrical outlets on the exterior of each building in an accessible	Complies	
---------------	--	---	--	----------	--



# Compliance Checklist for New Development

APPENDIX D

Topic	Policy	City Requirements	Project Requirements	Compliance	Discussion
Equipment	efficiency lawn and garden equipment.	accessible location to charge electric-powered lawn and garden equipment. Encourage the replacement of high-maintenance landscapes (like grass turf) with native vegetation to reduce the need for gas-powered lawn and garden equipment.	location. Consider installing low-maintenance, native landscaping to minimize the need for gas-powered lawn and garden equipment.	<input type="checkbox"/> Complies with Intent of Project Requirement <input type="checkbox"/> Not Applicable <input type="checkbox"/> Does Not Comply	
Construction Equipment	Reduce emissions from heavy-duty construction equipment by limiting idling and utilizing cleaner fuels, equipment, and vehicles.	idling times will be minimized either by shutting equipment off when not in use or reducing the maximum idling time to 5 minutes (as required by the California Airborne Toxics Control Measure Title 13, Section 2485 of California Code of Regulations [CCR]), or less. Clear signage will be provided at all access points to remind construction workers of idling restrictions.  Construction equipment must be maintained per manufacturer's specifications.	Shut construction equipment off when not in use or reduce the maximum idling time to 5 minutes (as required by the California Airborne Toxics Control Measure Title 13, Section 2485 of California Code of Regulations [CCR]), or less.  Maintain construction equipment per manufacturer's specifications.	<input type="checkbox"/> Complies <input type="checkbox"/> Complies with Intent of Project Requirement <input type="checkbox"/> Not Applicable <input type="checkbox"/> Does Not Comply	
Adaptation	Integrate potential climate change impacts into local planning documents and processes.	Planning and Building staff will work with project applicants to limit GHG emissions from construction equipment by selecting one of the following measures, at a minimum, as appropriate to the construction project: a. Substitute electrified equipment for diesel- and gasoline-powered equipment where practical. b. Use alternatively fueled construction equipment on-site, where feasible, such as compressed natural gas (CNG), liquefied natural gas (LNG), propane, or biodiesel. c. Avoid the use on on-site generators by connecting to grid electricity or utilizing solar-powered equipment. d. Limit heavy-duty equipment idling time to a period of 3 minutes or less, exceeding CARB regulation minimum requirements of 5 minutes.	Implement one of the following best practices to minimize construction related GHG emissions: Substitute electrified equipment for diesel- and gasoline-powered equipment where practical.  Use alternatively fueled construction equipment on-site, where feasible, such as compressed natural gas (CNG), liquefied natural gas (LNG), propane, or biodiesel.  Avoid the use on on-site generators by connecting to grid electricity or utilizing solar-powered equipment.  Limit heavy-duty equipment idling time to a period of 3 minutes or less, exceeding CARB regulation minimum requirements of 5 minutes.	<input type="checkbox"/> Complies <input type="checkbox"/> Complies with Intent of Project Requirement <input type="checkbox"/> Not Applicable <input type="checkbox"/> Does Not Comply	
Adaptation Mainstreaming		In development review, analyze and disclose possible impacts of climate change on the project or plan area, with an emphasis on sea level rise.	Review, analyze and disclose possible impacts of climate change on the project or plan area, with an emphasis on sea level rise.	<input type="checkbox"/> Complies <input type="checkbox"/> Complies with Intent of Project Requirement <input type="checkbox"/> Not Applicable <input type="checkbox"/> Does Not Comply	