Chapter III
Climate Action Strategies

Strategies

This Chapter describes the six strategies that Albany has developed to reduce the community's greenhouse gas (GHG) emissions and combat global climate change. Combined, these strategies have the potential to reduce approximately 15,660 metric tons of carbon dioxide equivalent (MT CO_2e) emissions. Climate Action Plan (CAP) strategies include the following:

Buildings and Energy: Minimize energy consumption; create high performance buildings, and transition to clean, renewable energy sources. The buildings and energy strategy recommends energy efficiency retrofits for existing buildings, enhances energy performance requirements for new construction, increases use of renewable energy, and improves community energy management.

Transportation and Land Use: **Create an interconnected transportation system and land use pattern that shifts travel from personal automobiles to walking, biking, and public transit.** The transportation and land use strategy identifies ways to reduce automobile emissions, including improving pedestrian and bicycle infrastructure, enhancing public transit service, supporting pedestrian- and transit-oriented development, discouraging single-occupancy vehicle use, and improving the City's vehicle fleet.

Waste: Minimize waste. The waste strategy builds on past City successes by increasing waste diversion rates and participation in recycling and composting throughout the community.

Green Infrastructure: Enhance natural assets that improve community quality of life. The green infrastructure strategy expands the City's urban forest.

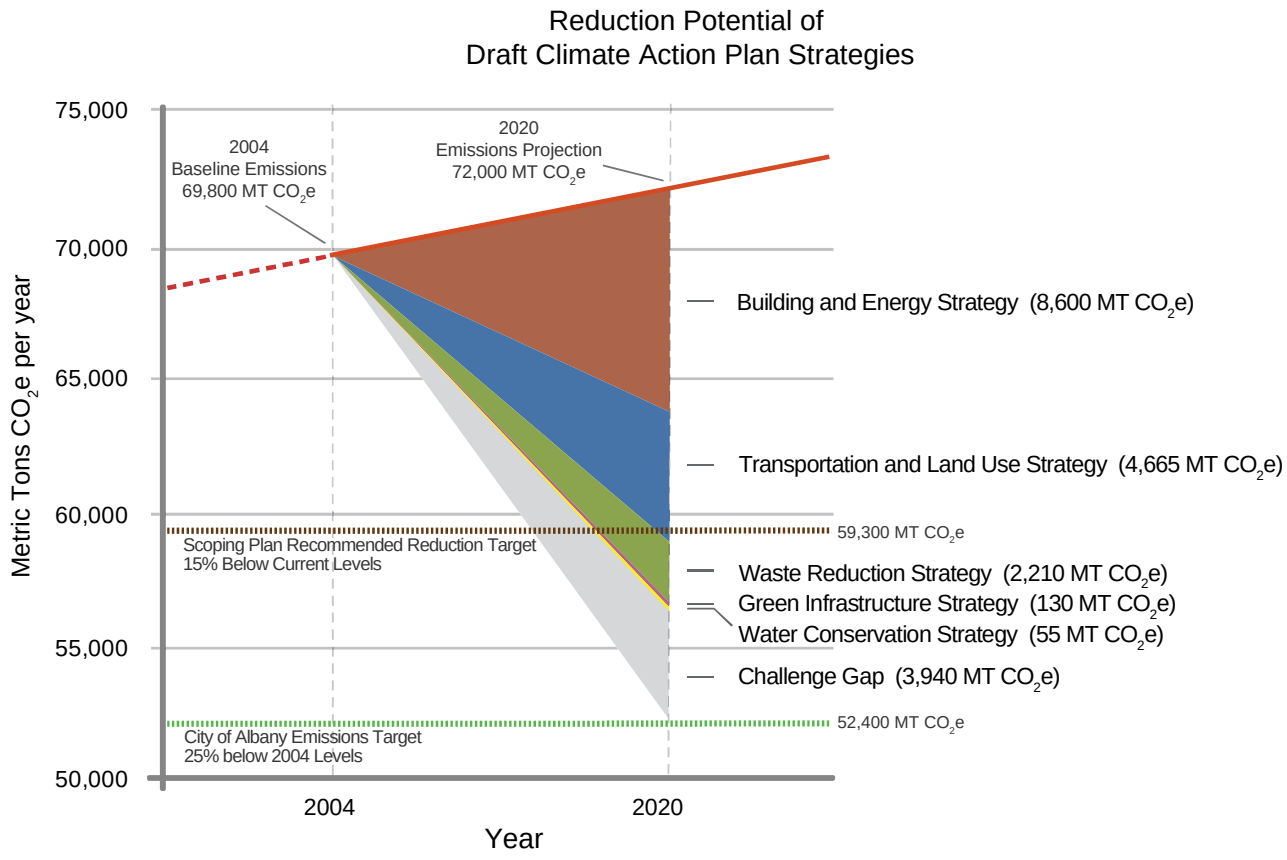
Water: Celebrate water as an essential community resource. The water strategy contains water conservation measures applicable to both indoor and outdoor water use.

Food and Agriculture: Create a sustainable and climate-friendly food system. The food and agricultural strategy promotes low-carbon diets, access to regionally-produced foods and expansion of urban agriculture within Albany.

Reduction Potential of Strategies and Objectives

The strategies contained within the Climate Action Plan identify approximately 15,660 MT CO_2e of potential reductions or 19% below 2004 baseline levels by 2020. The figure below demonstrates that this level of reduction goes above and beyond the recommendation of the State's *Climate Change Scoping Plan*, which calls on local governments to reduce community-wide emissions to 15% below current levels by 2020.

However, the proposed strategies alone do not achieve the City's adopted target of reducing emissions 25% below 2004 levels by 2020. To achieve this target, an additional 3,940 MT CO_2e of reductions will need to be generated. The City recognizes this as an important challenge for the community. Albany was purposefully conservative when estimating the reduction capacity of measures that require resident and business participation in order to not over-estimate potential reductions. If community participation in GHG-reducing activities exceeds the City's estimates, then GHG reductions could be higher than predicted and the target may be attained. The challenge facing the community is to mobilize high levels of voluntary participation in GHG-reduction efforts.



Buildings and Energy Strategy

The Buildings and Energy Strategy reduces approximately 8,600 MT CO_2e of GHG emissions, representing 55% of the CAP's total reduction capacity. Energy efficiency retrofits and renewable energy generation provide most of the reductions within this strategy. Most of Albany's residential and commercial buildings were built more than 30 years ago, prior to the adoption of California's energy efficiency standards. Considerable opportunity exists to reduce energy consumption in these structures. Albany also has high potential to support solar energy systems. Installing photovoltaic panels, solar hot water heating systems and integrating passive solar design in new construction has the potential to reduce GHG emissions.

Table III-1.
Buildings and Energy Strategy

Objective	GHG Reduction Potential (MT CO_2e)	Percentage of Strategy
BE-1: Zero-Emission City Buildings by 2015	150	2%
BE-2: Retrofit Existing Residential and Commercial Buildings to Increase Energy Efficiency and Maximize Use of Renewable Energy	6,440	75%
BE-3: Energy Performance in New Construction	1,550	18%
BE-4: Community Energy Management	460	5%
Total Buildings and Energy Strategy	**8,600**	**100%**

Transportation and Land Use Strategy

The Transportation and Land Use Strategy provides the second largest amount of emission reductions. By 2020, this strategy will reduce approximately 4,665 MT CO_2e of GHG emissions, providing about 30% of the community's total emission reductions. Albany's relatively dense neighborhoods, centrally located commercial districts, and existing public transit system provide a strong foundation for this strategy. Improving pedestrian and bicycle infrastructure and increasing diversity of uses within the City's commercial districts will provide the largest reductions. Reducing vehicle commute trips, facilitating pedestrian- and transit-oriented development, and improving public transit also contribute important reductions.

Table III-2.
Transportation and Land Use Strategy

Objective	GHG Reduction Potential (MT CO_2e)	Percentage of Strategy
TL-1: Facilitate Walking and Biking	2,295	49%
TL-2: Make Public Transit More User-Friendly	126	3%
TL-3: Promote Pedestrian- and Transit-Oriented Development	860	18%
TL-4: Reduce Vehicle Emission and Trips	1,384	30%
TL-5: Prepare for Peak Oil	-	-
Total Transportation and Land Use Strategy	**4,665**	**100%**

Waste Reduction Strategy

The Waste Reduction Strategy provides approximately 2,210 MT CO_2e of GHG reductions, or about 14% of the overall CAP reductions. For the last two decades, the City has been a leader in minimizing waste. Achieving a 90% waste reduction and diversion goal by 2030 will provide considerable GHG reductions.

Table III-3.
Waste Reduction Strategy

Objective	GHG Reduction Potential (MT CO_2e)	Percentage of Strategy
WR-1: Become a Zero-Waste Community	2,210	100%
Total Waste Reduction Strategy	**2,210**	**100%**

Green Infrastructure Strategy

Albany's green infrastructure includes many natural features that provide valuable ecosystem services to the community. The Green Infrastructure Strategy provides approximately 130 MT CO_2e of GHG reductions, or about 0.8% of the overall CAP reductions, by expanding Albany's urban forest. An enhanced urban forest would decrease building energy consumption and sequester carbon within tree biomass.

Table III-4.
Green Infrastructure Strategy

Objective	GHG Reduction Potential (MT CO_2e)	Percentage of Strategy
GI-1: Expand and Enhance the City's Green Infrastructure	130	100%
Total Green Infrastructure Strategy	**130**	**100%**

Water Conservation Strategy

The Water Conservation Strategy provides approximately 55 MT CO_2e of GHG reductions, or about 0.4% of the overall CAP reductions. Increasing water conservation provides multiple benefits to the community beyond GHG reductions.

Table III-5.
Water Conservation Strategy

Objective	GHG Reduction Potential (MT CO_2e)	Percentage of Strategy
WC-1: Conserve Water in Existing Buildings/Landscapes	10	18%
WC-2: Conserve Water in New Buildings/Landscapes	45	82%
Total Water Conservation Strategy	**55**	**100%**

Food and Agriculture Strategy

While the Food and Agriculture Strategy will help reduce global GHG emissions, the proposed measures would not reduce community emissions contained in the City's 2004 inventory. Therefore, emissions reductions have not been quantified for this strategy.

Community Challenge

The State's Climate Change Scoping Plan recommends that local governments reduce their community-wide GHG emissions to 15% below current levels by 2020. Albany's adopted target calls for the community to reduce its emissions to 25% below 2004 levels by 2020 or a reduction of approximately 19,600 MT CO_2e. The strategies described above achieve 15,660 MT CO_2e or 19% below 2004 baseline levels by 2020. While the strategies achieve the Scoping Plan recommended target they do not fully achieve the City's more aggressive target.

The Community Challenge calls upon residents, businesses, employees, and City staff to mobilize and achieve the remaining 3,940 MT CO_2e of GHG reductions. This can be achieved through high levels of community participation in the proposed measures or other individual reduction actions. Citizen involvement and leadership will be required to achieve these remaining reductions. The Community Challenge is described in more detail near the end of the chapter.

Relationship to Statewide Emission Reductions

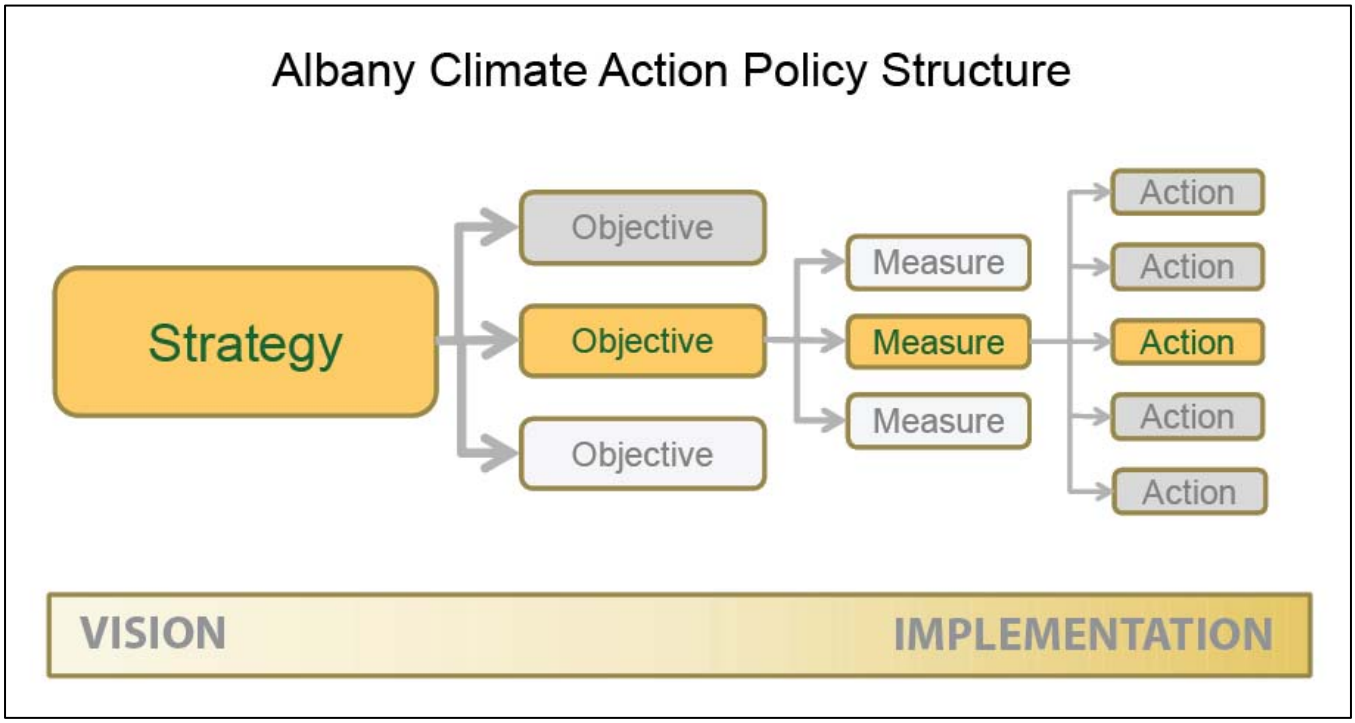
The City's CAP strategies are expected to reduce the community's GHG emissions exclusive of statewide reductions mandated through legislation such as Senate Bill (SB) 107 or Assembly Bill (AB) 1493. The City selected this approach to avoid potential double-counting of City and State GHG emission reductions. Albany has a long tradition of environmental stewardship and strives to provide a unique and independent contribution to the State's GHG gas reduction efforts.

Structure of the Climate Action Strategies Chapter

Preparing and adopting the CAP represents an early step toward achieving the City's GHG reduction target. To attain the target, the CAP must guide and facilitate change throughout the community. Each strategy contains *objectives*, *measures,* and *actions* that translate the CAP's vision into on-the-ground implementation. Objectives serve to refine the strategies into specific focus areas. Measures constitute one of the most important parts of the CAP as they define the direction that the City will take to accomplish its GHG reduction goals. Actions, in turn, define the specific steps that City staff and decision-makers will implement over time.

This chapter is divided into eight sections. The first six sections describe the Building and Energy, Transportation and Land Use, Waste, Green Infrastructure, Water, and Food and Agriculture strategies, respectively. The following section describes the Community Challenge and the additional efforts the community will need to make in order to achieve the adopted target. The final section describes the potential effect of statewide legislation on community emissions and how this relates to the City's reduction efforts.

Each strategy section provides an overview of that strategy's role in curbing the community's emissions and a background discussion describing how Albany's context relates to the objectives and measures. Following this discussion, the strategy's objectives and measures are presented.



Climate Action Measures

Within each measure descriptions are provided that identify both the City's policy direction and the action steps needed to implement each measure. Additionally, the measure descriptions provide a summary of GHG reduction potential, generalized costs to the City, estimated cost per metric ton of GHG reduction, and identification of whether or not the measure would result in costs to Albany home- or business-owners. Detailed action steps and progress indicators are also provided for the measures with quantified GHG reductions. The action steps and progress indicators will be used to evaluate the performance of each measure during implementation over the next decade.

Values within the *GHG Reduction Potential* column of the summary refer to the estimated annual emission reductions in 2020 in MT CO_2e. The *Cost to City* column uses a ranking of low, medium, and high. Low cost measures have an estimated annual cost that is less than 1% of the City's Capital Improvement Projects (CIP) or the Community Development Department (CDD) budgets. Medium cost measures would require between 1% and 5% of the CIP of CDD budget per year and high cost measures would require more than 5%. *Cost per Metric Ton* represents the estimated annual cost divided by the estimated annual GHG reduction potential (for quantified measures only). The *Private Cost* column identifies whether or not the measure is expected to result in direct costs to property or business owners. Supporting information describing how GHG reduction estimates were calculated is provided in Appendix B. Supporting information describing economic costs of each measure is contained in Appendix C.

Quantified Measures

The CAP contains 43 GHG reduction measures. The City has quantified the GHG reduction potential of 25 of these measures. Quantified measures fall into two sub-categories; primary measures and supporting measures. Primary measures provide direct GHG reductions that have been calculated and are identified within the table. In addition to GHG reduction values, estimated cost per metric ton of GHG reduction is estimated for each primary measure. Supporting measures facilitate the reduction potential of the related primary measure. The reduction potential of the supporting measure is contained within the potential of the primary measure.

Non-Quantified Measures

Non-quantified measures consist of measures whose GHG reduction potential could not be estimated at the time of plan preparation or measures that would not reduce emissions contained within the 2004 baseline inventory. The City's high standard for quantification methodologies may have resulted in the exclusion of some emissions reductions, but the standard reflects the City's desire to not over estimate the reduction potential of the CAP measures. In the future reliable quantification methods may be created and the City will include such reductions.

Measures capable of reducing emissions that are not included in the baseline inventory do not help the City achieve its 2020 emissions reduction target. These measures remain within the CAP because the City and the community recognize that these actions will reduce global GHG emissions and help protect the climate.

Selection of Measures and Action Steps

Achieving the City's GHG reduction goals will require considerable changes within the community over the next decade. Albany will need to improve alternative transportation infrastructure, accommodate infill development, increase energy and water efficiency, increase use of renewable energy, reduce waste, and enhance the urban forest. To ensure this transformation is realized, the CAP contains measures and action steps that are both ambitious and attainable.

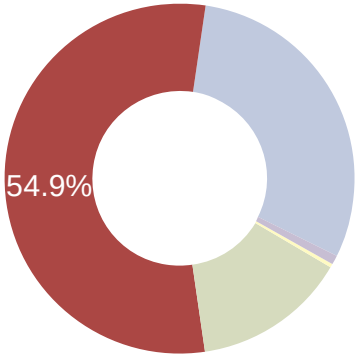
The climate action objectives and measures were developed through a) evaluation of existing community conditions, b) identification of GHG reduction opportunities within the city, including those identified by Albany's Clean and Green Task Force and Sustainability Committee, c) suggestions from the local community, d) review of best practices from leading cities and organizations, and e) incorporation of State and regional laws, guidelines, and recommendations.

After considering a wide range of potential measures, City staff, the Sustainability Committee, and the public selected the proposed measures based on the following criteria: GHG emissions reduction potential, likely cost, feasibility, and ability to create community co-benefits.

This Draft CAP provides a further opportunity for community input and review of the measures and actions. The City strongly encourages residents and business owners to provide input and feedback on the contents of this document.

Buildings and Energy Strategy

Minimize energy consumption, create high performance buildings, and transition to clean, renewable energy sources.



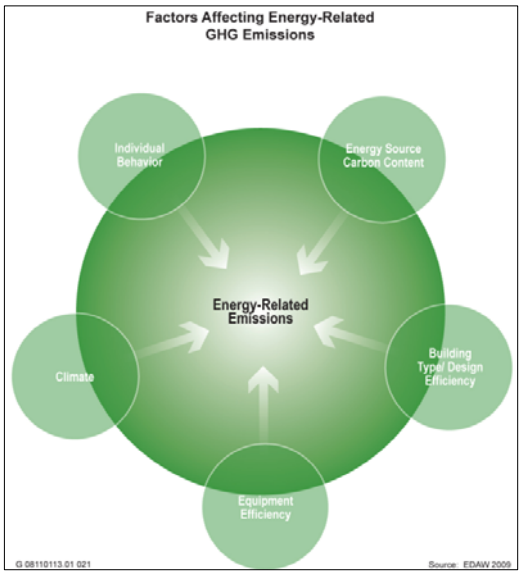
Total GHG Emissions Reduced:
8,600 Metric Tons

Objectives:

BE-1: Zero-Emissions City Buildings by 2015	- 2%
BE-2: Retrofit Existing Residential and Commercial Buildings	- 75%
BE-3: Energy Performance in New Construction	- 18%
BE-4: Community Energy Management	- 5%

Energy consumption in Albany's residential, commercial, and industrial buildings generates almost two-thirds of the City's GHG emissions. Energy efficiency improvements, renewable energy generation, green building techniques, and community energy management systems will all play important roles in helping the community achieve its GHG reduction goals.

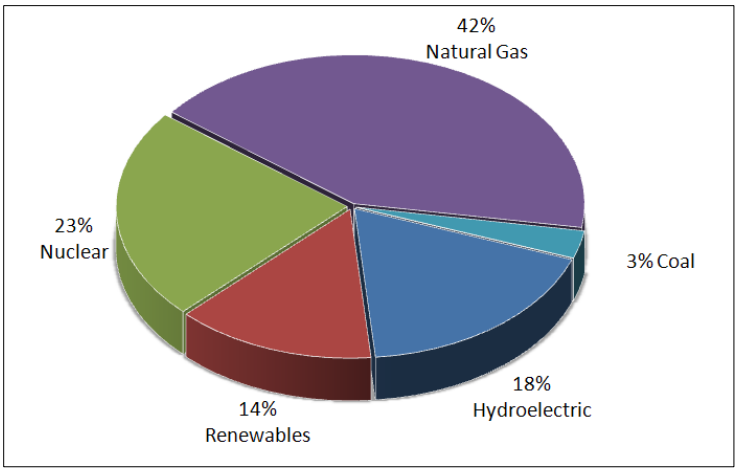
Natural gas and electricity are the two main forms of energy used within residences, businesses, and civic operations in Albany. In the Bay Area, natural gas is the primary energy source used to heat buildings, heat water, and cook. Though the carbon content of natural gas is lower than many other fossil fuels, its combustion releases considerable amounts of GHGs. Electricity used in Albany is produced at a wide variety of power generation facilities. Natural gas and coal fired power plants provide roughly half of Albany's electricity supply.



The Buildings and Energy strategy provides diverse measures aimed at reducing energy consumption and reliance on fossil fuel energy sources. Successful energy efficiency improvements will allow residents, business owners, and the City to considerably reduce energy consumption within both buildings and operations. Increasing renewable energy generation within the community will provide a local source of clean energy and will reduce the need for fossil fuel-fired power generation. Developing district heating and cooling systems and integrating smart grid technologies will clear the way for more efficient energy use. In addition to reducing GHG emissions, these measures can also lower energy bills, increase building comfort, and reduce Albany's vulnerability to energy price fluctuations.

Background

Energy Source – *Albany's current energy portfolio.*



Pacific Gas and Electric (PG&E) is Albany's energy utility, providing both natural gas and electricity for residential, commercial, industrial, and municipal uses. PG&E generates electricity at hydroelectric, nuclear, renewable, natural gas, and coal facilities. Hydroelectric operations provide 18% of the total supply. Other types of renewable energy facilities including solar, geothermal, and biomass provide 14%, nuclear plants provide 23%, natural gas facilities provide 42% and coal provides three percent. In 2007, 55% of the community's electricity was GHG free (Silverman 2007).

Under the provisions SB 107, investor-owned utilities will be required to generate 20% of their retail electricity using qualified renewable energy technologies by the end of 2010. In compliance with this mandate, PG&E will expand its renewable generation portfolio from 14% to at least 20%, and additional GHG-free electricity will be available to customers in Albany. For more details, see the statewide reductions discussion at the end of this chapter.

Building Stock – *The age and characteristics of Albany's homes and non-residential buildings.*

In 1978 the State of California established a set of energy efficiency standards for residential and nonresidential buildings. These standards, referred to as Title-24, are updated periodically to allow consideration and possible incorporation of new energy efficiency technologies and methods. As a result of these standards, homes built within the last decade are approximately 4.5 times more efficient per square foot than homes built prior to 1960. For this reason, the age of a community's building stock has important implications for both building energy consumption and GHG emissions.

Residential Building Stock

U.S. Census data states that 89% of Albany's residential housing stock was constructed prior to implementation of Title-24 standards. Forty-two percent was constructed prior to 1939. Homes of this vintage frequently have minimal insulation, antiquated furnace systems, single-pane windows, and gaps in the building envelope. While a portion of the City's housing stock has been retrofitted to include energy efficiency improvements, a high level of energy savings potential still remains in the majority of the homes.

Commercial Building Stock

Approximately 90% of Albany's commercial building stock was constructed prior to Title 24. Commercial buildings built prior to 1980 often have inefficient heating, ventilation and air conditioning units. Additionally lighting systems and major appliances such as refrigeration units can often be considerably improved.

Table III-6. Age of Albany Housing Stock		
Construction Period	**Number**	**% of Total**
Built 1999 to 2000	201	3%
Built 1995 to 1998	34	0%
Built 1990 to 1994	83	1%
Built 1980 to 1989	467	6%
Built 1970 to 1979	841	12%
Built 1960 to 1969	898	12%
Built 1950 to 1959	813	11%
Built 1940 to 1949	877	12%
Built Pre 1940	3,034	43%
Total	**7,248**	**100%**

Source: U.S. Census, 2000; EDAW 2009.

Table III-7. Age of Albany Commercial Building Stock		
Construction Period	**Number of Buildings**	**% of Total**
Built 2000 to 2009	4	3%
Built 1990 to 1999	6	5%
Built 1980 to 1989	2	2%
Built 1970 to 1979	12	9%
Built 1960 to 1969	15	12%
Built 1950 to 1959	18	14%
Built 1940 to 1949	22	17%
Built Pre 1940	49	38%
Total:	**128**	**100%**

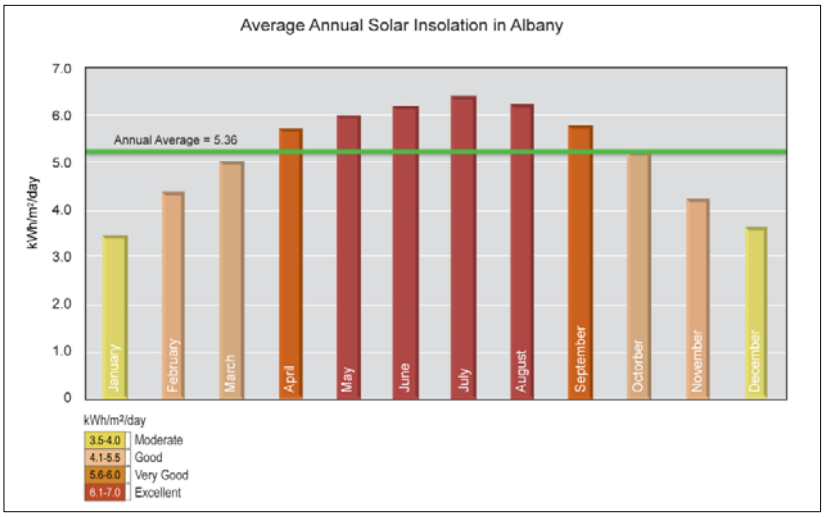
Source: City of Albany, 2009; EDAW, 2009.

Renewable energy – *The potential for renewable energy generation within the community.*

Renewable energy can be produced using distributed generation facilities such as rooftop solar systems or can be purchased through the utility grid from remote generation facilities. Presently, a limited number of renewable energy generation systems are located within Albany. Approximately 66 buildings have installed solar photovoltaic or solar hot water heater systems since 1999. No wind turbines are located within the city. As stated above, in 2007 13% of PG&E's grid portfolio came from renewable sources (exclusive of major hydroelectric facilities) and with implementation of SB 107, this will increase to 20% by 2011. Increasing local renewable energy generation and grid content will reduce considerable amounts of GHG emissions in the community.

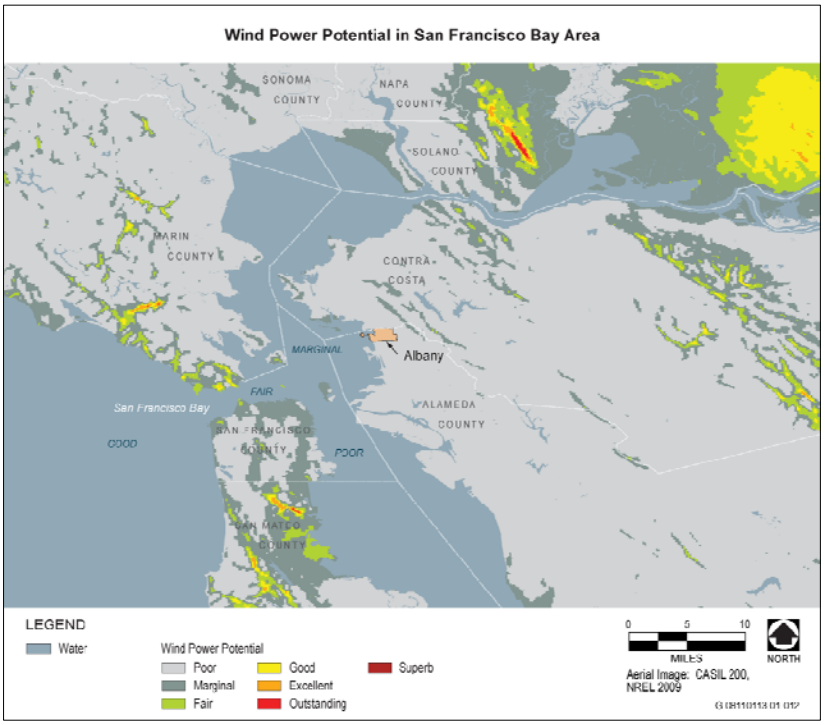
Solar Energy Potential

National Renewable Energy Laboratory (NREL) data indicates that solar energy is the most promising option for future renewable energy generation within the community (NREL 2002). Albany receives enough energy from the sun to produce an average of 5.36 kilowatts hours (kWh) per square meter per day. This level of solar insolation suggests a high potential for both photovoltaic and solar hot water heating systems in the City. Insolation levels fluctuate between summer and winter, however during the majority of the year, solar energy generation is considered good to excellent. December and January have moderate, but still acceptable, potential for solar energy generation.



Wind Energy Potential

NREL data generated using site observations and computer modelling indicates that potential for wind energy generation in Albany is low (NREL 2009). NREL models can under or over estimate wind power potential in a specific location.



Other Renewable Energy Sources

Tidal generation offers another potential source of renewable energy, but requires additional research to determine if it is practical in the San Francisco Bay. Other renewable technologies such as biomass, geothermal, and micro-hydro-generation are not likely to be practical within the City. Thus, these methods have not been considered within the CAP.

Building and Energy Objectives and Measures

Objective BE-1:

Lead by Example with Zero-Emission City Buildings by 2015

The City of Albany has the opportunity to serve as an example to the rest of the community by transitioning to zero-emission municipal buildings by 2015. The following measures work together to reduce energy demand, improve energy efficiency, and incorporate renewable generation technologies within City buildings.

Measure BE 1.1: Install cost-effective renewable energy systems on all city buildings, and install building performance data displays to demonstrate savings.

The City will conduct energy efficiency audits of all municipal buildings and explore the potential to locate renewable energy systems on City properties. The City will implement cost effective efficiency improvements and renewable energy investments. Remaining energy needs will be met through purchases of renewable and preferably local energy sources or from membership in PG&E's Climate Smart Program. The City will also install electronic building performance displays in each publicly-accessible building. The displays will provide building managers, employees, and visitors with easy-to-understand information on electricity, gas, and water use. Over time, this information will facilitate effective use of energy and water in municipal operations.

GHG Reduction Potential (MT CO_2e)	Cost to City	Cost Per Metric Ton	Private Cost
150	$8,400	$60	No

Actions		Timetables	Responsibility
A	Conduct energy audits of all municipal buildings.	Before December 31, 2010	Building
B	Evaluate the potential to locate cost-effective renewable energy systems on City properties.	Before July 31, 2012	Environmental Resources Building
C	Purchase remaining energy from renewable sources or from PG&E's Climate Smart Program.	Before January 1, 2015	Building
D	Install electronic building performance displays in all publicly accessible buildings.	Before December 31, 2014	Building

	Progress Indicators	Target
i	Percentage of energy efficiency improvement in City buildings through retrofits and conservation measures (baseline year 2005).	20% by 2015 40% by 2020
ii	Percentage of City's building electricity from renewable sources.	100% by 2015

Objective BE-2:

Retrofit Existing Residential and Commercial Buildings to Increase Energy Efficiency and Maximize Use of Renewable Energy

Energy efficiency improvements and the installation of renewable energy generation systems have the potential to reduce considerable amounts of GHG emissions in Albany. The objective outlines public outreach programs, incentivizes and policies that will facilitate implementation within the community.

Residential

Improving the energy efficiency of Albany's existing housing stock represents a major opportunity for the community. Efficiency retrofits are capable of reducing emissions, while also reducing home energy bills and increasing comfort for occupants.

To maximize the number of residential energy efficiency improvements, the CAP establishes a comprehensive program that will educate homeowners about the benefits of efficiency upgrades, encourage home energy audits, provide financial incentives to complete energy efficiency improvements, and require point-of-sale improvements.

To achieve the estimated levels of GHG reduction, more than half of the residential units in Albany will need to implement energy efficiency improvements by 2020. The City envisions that educational programs, home audits, and financial incentives will motivate the majority of homeowners to make the necessary improvements. A point-of-sale ordinance will also be used to ensure that this important goal is obtained.

Commercial

Energy efficiency improvements in commercial buildings will provide important GHG reductions and help community businesses to reduce long term energy costs. The City seeks to provide a comprehensive commercial energy efficiency improvement program that facilitates efficiency education and outreach and provides financial incentives. The City envisions that the educational programs and financial incentives will encourage many businesses to voluntarily invest in efficiency improvements. A commercial point-of-sale ordinance will further ensure that the commercial building retrofit target is attained.

Renewable Energy Generation

To meet the GHG reduction targets expressed in AB 32 and Executive Order (EO)-S-3-05, we must reduce use of fossil fuel-based energy. Expanding renewable energy generation capacity within Albany will aid this effort. The City will develop a comprehensive renewable energy program that educates residents and businesses about the potential for solar energy generation within the community and provides financing mechanisms that maximize participation.

Measure BE 2.1:	Develop comprehensive outreach programs to encourage energy efficiency and renewable energy investments in the community.

Many property owners are not aware of the opportunities for energy efficiency and renewable energy investments. The City will partner with PG&E and other organizations to conduct a variety of public education and outreach campaigns that promote energy efficiency improvements. The City will encourage participation in free energy audit programs offered by various community non-profits and to take advantage of the low-cost energy efficiency financing program described below.

Measure BE 2.1: Develop comprehensive outreach programs to encourage energy efficiency and renewable energy investments in the community.

The City will also develop an outreach program that encourages property owners to install solar photovoltaic and solar hot water systems. The program will aim to maximize participation of the community in renewable energy generation. As described in Measure BE-2.2, the City will partner with Alameda County and regional agencies to create an effective renewable energy and energy efficiency financing program.

GHG Reduction Potential (MT CO_2e)	Cost to City	Cost Per Metric Ton	Private Cost
2,935	$13,400	$5	No

Action		Timetables	Responsibility
A	Work with PG&E and other community organizations to develop energy efficiency outreach programs for property owners.	On-going	Environmental Resources
B	Work with community organizations to facilitate energy audits in the community.	On-going	Environmental Resources
C	Develop an Albany Climate Action Partner publicity campaign for businesses who achieve a 20% or greater increase in building energy efficiency.	Before July 31, 2011	Environmental Resources
D	Develop outreach program to encourage property owners to install renewable energy systems.	Before December 31, 2010	Environmental Resources

Progress Indicators		Target
i	Percentage of residential units and commercial uses that have voluntarily implemented energy efficiency improvements.	2% of single-family units by 2015 4% of commercial uses by 2015 5% of single-family units by 2020 8% of commercial units by 2020
ii	Percentage of residential buildings that have installed photovoltaic or solar hot water heaters.	10% by 2015 20% by 2020

Measure BE 2.2:	Identify and develop low-cost financing products and programs to encourage investment in energy efficiency and renewable energy in existing residential and commercial buildings.

Up-front costs of energy efficiency improvements and renewable energy systems (photovoltaic and solar hot water) would be a considerable burden for many homeowners and businesses. The City, in partnership with Alameda County, PG&E, and/or private lenders, will provide a series of cost-effective financing options to reduce this burden.

Financing options could include, but are not limited to, on-bill financing, low interest loans, energy efficient mortgages, revolving loans from bond sales, or an energy efficient Local Improvement District. The City will evaluate various financing products that would encourage property owners to invest in energy efficiency upgrades and renewable energy systems in existing homes. This evaluation will be conducted prior to July 31st, 2010. The City will establish a working financing program by December 31st, 2010.

The structure of the potential programs and products varies greatly. On-bill financing, low interest loans, and energy efficient mortgages establish a lender/borrower relationship in which the City, utility, County, or private lender loans the building owner money to pay for upgrades and the amount loaned is paid back over time. The cost (or payback) to the City is wholly dependent on how much the City intends to subsidize interest rates. In the case of the bond, the City would administer a revolving loan fund with the bond proceeds, pursuant to provisions of AB 811. It would also depend on the increase in energy costs, whether carbon offsets can help pay for improvements, energy efficiency rebates, and potential federal tax credits.

A number of options are available to the City, including participating in a countywide or regional program where homes would obtain an energy audit by a certified energy audit specialist, who would calculate the estimated energy efficiency improvement cost. This amount would either be charged as a voluntary property tax assessment paid over a pre-defined period (i.e., the length of payment would be based on the length of the bond); or the property owner would be charged an additional property transfer tax at the point of sale. Property owners would then make improvements to their home based on the recommended changes and would be reimbursed after confirmation by a certified energy audit specialist.

Another option includes on-bill financing, which would amortize the cost of energy efficiency retrofits to the property's monthly energy bills. In this scenario, the property owner would be reimbursed by the utility (i.e., PG&E). The intent would be to create marginal to no financial impact to the property owner as the amortized costs would be similar to the monthly energy savings.

GHG Reduction Potential (MT CO_2e)	Cost to City	Cost Per Metric Ton	Private Cost
Supporting (BE-2.1 & BE-2.3)	$85k-645k	-	Yes

Measure BE 2.3: Develop and implement point-of-sale residential and commercial energy efficiency upgrade requirements.

Based on residential property turnover in 2000, approximately 32% of Albany's existing single-family homes and 24% of existing apartment buildings will be sold to new owners between 2010 and 2020. The City of Albany will adopt a Residential Energy Conservation Ordinance requiring that at the point-of-sale, current homeowners will be required to demonstrate that key efficiency upgrades have been made to the home prior to transfer of ownership.

Required upgrades will include the elements described in the Alameda County Waste Management Authority's entry-level energy efficiency Green Package or equivalent upgrades that achieve a 20% efficiency improvement. The entry-level package would include duct sealing, attic insulation, programmable thermostats, water heater insulation, hot water pipe insulation, and draft elimination. The total cost of such improvements in Albany would be approximately $7,500 to $10,000 dollars per single-family home (as of 2009). Financing options described in Measure BE-2.2 would reduce this up-front cost to homeowners.

To facilitate energy efficiency in multi-family properties, the City will additionally require landlords to provide information on average utility bills per unit to existing and potential tenants and to the City. The City will also work with property owners to develop specific programs that encourage efficiency improvements in multifamily buildings.

Based on commercial property sales data from 2000, it is estimated that approximately 30% of commercial buildings will be sold between 2010 and 2020. The City of Albany will adopt a Commercial Energy Conservation Ordinance that requires owners of buildings built prior to the implementation of Title 24 to perform key efficiency upgrades at the point-of-sale, prior to the transfer of ownership. Owners will be required to demonstrate a 15% improvement in building energy efficiency. Due to the diversity of building types and a desire to provide owners with maximum flexibility, specific efficiency improvement requirements are not defined.

GHG Reduction Potential (MT CO_2e)	Cost to City	Cost Per Metric Ton	Private Cost
1,310	$2,600	$2	Yes

Action		Timetables	Responsibility
A	Adopt a Residential Energy Conservation Ordinance requiring point-of-sale energy efficiency upgrades.	Before July 31, 2010	City Council Planning & Zoning
B	Work with Stopwaste.org to verify that the required efficiency upgrade package achieves at least 20% improvement in average Albany home.	Before July 31, 2010	City Council Planning & Zoning
C	Adopt a Commercial Energy Conservation Ordinance requiring point-of-sale energy efficiency upgrades.	Before July 31, 2012	Building
D	Adopt ordinance that requires landlords to provide information on average utility bills per unit to existing and potential tenants and to the City.	Before July 31, 2012	City Council Environmental Resources
E	Create energy efficiency rating system for all rental properties within Albany.	Before January 1, 2015	Environmental Resources
Progress Indicators		**Target**	
i	Percentage of residential units and commercial uses that have implemented energy efficiency improvements at point-of-sale.	20% of single-family units by 2015 15% of multi-family units by 2015 15% of commercial uses by 2015 32% of single-family units by 2020 24% of multi-family units by 2020 30% of commercial units by 2020	

Measure BE 2.4: Identify and facilitate solar energy EmPowerment districts in commercial, industrial, and mixed-use portions of City.

The solar energy EmPowerment District initiative is another key component of the City's renewable energy program. The District will encompass the commercial, institutional and industrial areas of Albany. Commercial and industrial rooftops and parking lots within Albany represent a prime opportunity for solar energy generation. Commercial and industrial facilities tend to have large, flat roofs that are typically very well-suited for installation of solar photovoltaic (PV) systems. By partnering with solar energy companies, building owners can install PV systems on their roofs or parking lots at no up-front cost, and then purchase the electricity generated from the system. Private solar contractors are able to package solar tax incentives to further reduce the cost, where, under optimal solar conditions, distributed PV systems can reduce a property owner's energy costs during the lease period.1 Some solar installers will also directly lease the roof area if it is appropriately sized, can physically support the weight of the PV systems, and has optimal solar conditions.

To achieve the stated GHG reductions, the City must achieve installation of PV systems on 40% of all eligible structures and parking areas within defined EmPowerment Districts. To maximize participation, the City will provide extensive outreach and technical assistance to interested property owners. The City will also streamline permitting process and remove regulatory obstacles that may reduce or hinder system installation.

GHG Reduction Potential (MT CO_2e)	Cost to City	Cost Per Metric Ton	Private Cost
2,195	$1,300	$1	Yes

	Action	Timetables	Responsibility
A	Define Solar EmPowerment Districts within the community and identify solar generation opportunity sites (e.g., buildings and parking lots).	Before July 31, 2010	Planning & Zoning Environmental Resources
B	Conduct analysis of potential regulatory, structural, and market barriers to installation of photovoltaic systems on commercial buildings within defined EmPowerment Districts.	Before December 31, 2010	Building Environmental Resources
C	Develop outreach and technical assistance programs to facilitate installation of solar systems.	Before July 31, 2011	Environmental Resources
D	Streamline permitting process for photovoltaic system installation in EmPowerment Districts.	Before July 31, 2011	Building

	Progress Indicators	Target
i	Percentage of eligible buildings and parking lots with photovoltaic systems within EmPowerment District.	25% by 2015 40% by 2020

[1] Note that each roof is different and will depend on its solar orientation, weight-bearing capacity, size, potential shadowing, and a number of other factors that ultimately determine the price of the power purchasing agreement.

Measure BE 2.5:	Join Bay Area efforts to ensure green public transit energy sourcing.

Today, public transit in the Bay Area uses a diversity of energy sources including electricity, gas, diesel, natural gas, biodiesel, and hydrogen to power vehicles. Opportunity exists to transition public transit to renewable energy sources. Over time, renewable energy could make transit a GHG-neutral form of transportation. The City will join existing efforts to encourage Bay Area transit agencies to switch to renewable energy sources. However, before the City will support the use of biofuels, it will require the agencies to consider the lifecycle effects associated with each fuel type. The City will not support the use of biofuels that create remote environmental impacts such as rainforest habitat destruction or global food price increases. It should be noted that public transit-related emissions are not accounted for in the 2005 emissions inventory or baseline inventory and therefore any reductions gained from implementing this measure would not contribute specifically to the attainment of Albany's reduction target.

GHG Reduction Potential (MT CO_2e)	Cost to City	Cost Per Metric Ton	Private Cost
Not included in inventory	$1,300	-	No

Objective BE-3:

Require Energy Performance In New Construction

In 2007, the City of Albany adopted a Green Building Ordinance. The Ordinance requires commercial and residential construction and renovations to be constructed in compliance with Leadership in Energy and Environmental Design (LEED) and GreenPoint Rated certification systems. While implementation of this code will greatly enhance the overall environmental performance of new buildings throughout the community, these two certification systems are not explicit in terms of requiring improved energy efficiency standards. Such standards will be important to ensuring GHG reductions are achieved in new construction. For this reason, the City will revise the municipal code to adopt the energy efficiency standards contained in the 2008 California Green Building Code (CGBC).

Measure BE 3.1:	Require new construction to comply with Tier 2 energy efficiency standards contained within section 503.1.2 of the California Green Building Code.

The City will amend the existing Albany Green Building Ordinance and adopt the Tier 2 energy efficiency standards contained in Section 503.1.2 of the 2008 CGBC as the required standards for energy efficiency for all new construction in the community. Adoption of the CGBC energy efficiency standards into the City Green Building Ordinance will provide for a 30% increase in energy efficiency over 2007 Title 24 requirements.

GHG Reduction Potential (MT CO_2e)	Cost to City	Cost Per Metric Ton	Private Cost
1,550	$1,300	$1	Yes

Action		Timetables	Responsibility
A	Amend the Albany Green Building Ordinance to incorporate the Tier 2 energy efficiency standards contained in Section 503.1.2 of the 2008 California Green Building Code as the required standards for energy efficiency for new construction.	Before December 31, 2010	City Council Building
Progress Indicators		**Target**	
i	NA	NA	

Measure BE 3.2: Require that all new multi-tenant buildings be sub-metered to allow each tenant the ability to monitor their own energy and water consumption.

Multi-family residential buildings in Albany typically do not have separate gas and electric meters for each unit. Single meters require landlords to charge a flat rate to all tenants. This flat rate reduces an individual tenant's incentive to conserve energy. The City will amend the Building Code to require that all new multi-family buildings be sub-metered to encourage conservation.

GHG Reduction Potential (MT CO_2e)	Cost to City	Cost Per Metric Ton	Private Cost
Not quantified	$1,300	-	Yes

Objective BE-4:

Community Energy Management

Climate change requires utilities, cities, and consumers to rethink how we use energy. Fortunately, both emerging and time tested tools can help achieve this transformation, including smart grid technology, advanced lighting fixtures and systems, community choice aggregation, and consumer education programs.

Measure BE 4.1: Partner with other neighboring cities and PG&E to fast-track smart grid technology in Albany.

The existing electricity delivery system in Albany relies on 100-year old technology. Electricity flows over the grid from power plants to consumers, and reliability is ensured by maintaining excess capacity. The result is an inefficient and environmentally wasteful system that emits large amounts of GHGs, relies heavily on fossil fuel power plants, and is not well-suited to accommodate distributed solar or wind energy sources. The smart grid, an emerging energy management system, which combines information technology with renewable energy to significantly improve how electricity is generated, delivered, and consumed. The smart grid will reduce energy demand, improve integration of distributed energy production, and increase the efficiency of electricity transmission and distribution. These changes will help residents and business save energy, and can reduce GHG emissions associated with energy production.

The City will work with PG&E and other neighboring cities to encourage full implementation of smart grid technologies within Albany. PG&E is already planning to install smart meters, a key component of the larger smart grid, in all homes and businesses in the Bay Area by 2010. While full integration of the smart grid will take time to realize, energy analysts estimate that it will ultimately be capable of reducing electricity-related GHG emissions by between four and 30% below current levels (CISCO 2008). When estimating the potential GHG emission reductions associated with implementation of the smart grid, the City used the low end of these projections.

GHG Reduction Potential (MT CO_2e)	Cost to City	Cost Per Metric Ton	Private Cost
160	$1,300	$8	No

Action		Timetables	Responsibility
A	Partner with PG&E and develop a community smart grid integration plan.	Before December 31, 2011	Environmental Resources Public Works
B	Develop outreach program that informs property owners and businesses about benefits of smart grid and smart appliances.	Before July 31, 2012	Environmental Resources

Progress Indicators		Target
i	Percent of buildings with Smart Meters.	100% by 2015
ii	Percent of communitywide energy savings from Smart Grid Integration.	4% by 2020

Measure BE 4.2: Work with Alameda County to convert all street lights to LED bulbs or LED-solar systems.

Replacing conventional lamps in streetlights to Light Emitting Diode (LED) lamp technologies is a proven way to reduce both energy consumption and GHG emissions. Cities that have converted streetlights to LED have reduced their energy consumption by 40 to 70% (California Lighting Technology Center 2009, Clinton Foundation, 2010). An additional benefit of using LED lamps is the ability to focus LED lights upon intended targets, allowing greater distance between lamp posts and reducing light pollution and glare. The City will work with Alameda County to convert the approximately 350 streetlights within the city to LED technologies.

GHG Reduction Potential (MT CO_2e)	Cost to City	Cost Per Metric Ton	Private Cost
170	$34,000	$200	No

Action		Timetables	Responsibility
A	Partner with Alameda County and convert all existing streetlights to LED bulbs.	Before December 31, 2014	Public Works

Progress Indicators		Target
i	Percentage of streetlights converted to LED.	100% by 2014

Measure BE 4.3 Research the feasibility of joining the Community Choice Aggregation efforts of Berkeley, Oakland, Emeryville, and other neighboring cities.

Albany has the option to join the community choice aggregation (CCA) efforts of other East Bay cities including Berkeley, Oakland, Emeryville, Pleasanton, and Richmond. AB 117 (2002) enables California cities and counties, either individually or as groups, to supply electricity to customers within their borders. Unlike a municipal utility, a CCA does not own the transmission and delivery systems, but is responsible for providing electricity to its constituent residents and businesses. The CCA may or may not own electric generating facilities. On average, CCAs can provide energy at prices 15 to 20% lower than investor owned utilities (LGC 2006).

The benefits of a CCA are directly relevant to GHG reduction efforts, as communities are able to proactively determine the amount of GHG-free energy (e.g., renewable, hydro-electric, nuclear) they purchase. Joining the CCA would allow the City to independently select electricity providers. The City would be able to reduce their electricity-related GHG emissions by selecting an electricity-supply portfolio that utilizes more GHG-free energy sources than the current Pacific Gas and Electric (PG&E) portfolio. The current PG&E electricity portfolio is comprised of 55% GHG-free sources; therefore, in order for the CCA to provide a net benefit in GHG reductions, it is assumed that the City's CCA portfolio would range from 60-100% GHG-free electricity generation sources. The range of GHG-free portfolio mixes (i.e., 60 to 100%) was used to adjust the current PG&E-specific electricity emission factor assuming the same ratio of GHG-producing sources (i.e., natural gas and coal) would continue with the CCA. The following table presents the emission reductions associated solely with the CCA program.

TABLE III-10. Emission Reductions From Community Choice Aggregation Program

Community Choice Aggregation GHG-Free Portfolio	Direct GHG Reduction in 2020 ($MTCO_2e$/year)
60%	1,800
100%	16,140

Sources of information: *Martin, Greg. 2007. 2005 PG&E-specific electricity emission factor. Oakland, CA.*

A CCA program that resulted in the purchase of a high percentage of GHG-free energy could contribute considerably to achievement of Albany's $GHG_{emissions}$ reduction target. If the CCA purchased 100% of its electricity from GHG-free sources, this measure alone would alone achieve 16,140 $MTCO_2e$ /year (82%) of the 2020 emissions target of 19,600 $MTCO_2e$ /year (a reduction of 25% below 2004 levels by 2020). Combined with the reduction potential of other non-building energy measures (7,060 $MTCO_2e$ /year) the CAP would reduce community emissions to 30% below 2004 levels by 2020.

The City acknowledges that limits to the GHG reduction potential of a CCA program could exist. Price or supply constraints could limit the CCA's ability to purchase high percentages of GHG-free energy. The City would evaluate the cost of GHG-free energy. The City would also need to ensure that its purchases of GHG-free energy are derived from additional generation sources rather than existing sources. Purchases from existing sources would not lead to reductions in global GHG emissions, as Albany's purchase of existing supplies of GHG-free energy could result in the reduction in GHG-free energy by other existing consumers.

An additional issue is that implementation of the CCA would reduce the GHG emissions reduction potential of other Building Energy measures because less GHG emissions would be generated by electricity consumption. If the CCA purchased 100% of its electricity from GHG-free sources, the reduction potential of other electricity conservation or renewable electricity generation measures would be nullified. If the CCA purchased 60% of its electricity from GHG-free sources, the impact to the reduction potential would be minimal.

Due to the uncertainty involved in establishing a CCA, the City has chosen not to include the potential GHG emissions reductions from this measure in the CAP's total estimated reductions.

Measure BE 4.3	Research the feasibility of joining the Community Choice Aggregation efforts of Berkeley, Oakland, Emeryville, and other neighboring cities.

GHG Reduction Potential (MT CO_2e)	Cost to City	Cost Per Metric Ton	Private Cost
See measure text	$1,300	-	No

Measure BE 4.4:	Encourage PG&E and EBMUD to provide comparative energy and water conservation metrics on utility bills.

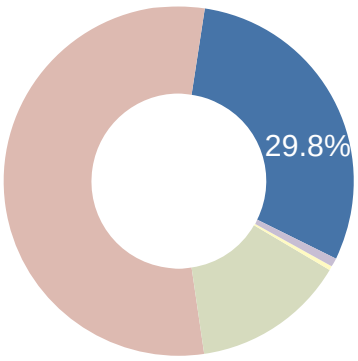
PG&E and EBMUD provide Albany residents and businesses with energy, water, and sewer services. The City will encourage these utilities to provide comparative energy and water conservation metrics and educational statements on utility bills. The bills should include statements that support efficient consumer practices and provide inefficient consumers with practical information on how to reduce their bills and energy consumption. The statements should also contain an efficiency ranking metric of similar uses in the community. This practice has been found to achieve a 2% reduction in residential electricity consumption (Tsui 2009).

GHG Reduction Potential (MT CO_2e)	Cost to City	Cost Per Metric Ton	Private Cost
130	$1,300	$10	No

Action		Timetables	Responsibility
A	Work with PG&E and EBMUD to establish comparative metrics on all residential utility bills.	Before December 31, 2011	Environmental Resources
Progress Indicators		**Target**	
i	NA	NA	

Transportation and Land Use Strategy

Create an interconnected transportation system and land use pattern that shifts travel from autos to walking, biking, and public transit.



Total GHG Emissions Reduced:
4,665 Metric Tons

Objectives:

- TL-1: Facilitate Walking and Biking - 49%
- TL-2: Make Public Transit More User-Friendly - 3%
- TL-3: Promote Pedestrian/Transit-Oriented Development - 18%
- TL-4: Reduce Vehicle Emissions and Trips - 30%
- TL-5: Prepare for Peak Oil

Reducing automobile-related GHG emissions will require advances in technology and improvements in community land use patterns and infrastructure. While State-mandated technological changes such as improvements in vehicle fuel efficiency and reductions in fuel carbon content are critical to reducing vehicle emissions, these alone will not be enough to achieve reductions required from transportation. Improving pedestrian, bicycle, and transit infrastructure as well as encouraging pedestrian- and transit-oriented mixed-use development are essential parts of achieving Albany's GHG reduction goal. As most infrastructure and land use decisions affecting Albany are made by the City, the objectives and measures described in this section primarily focus on these topics.

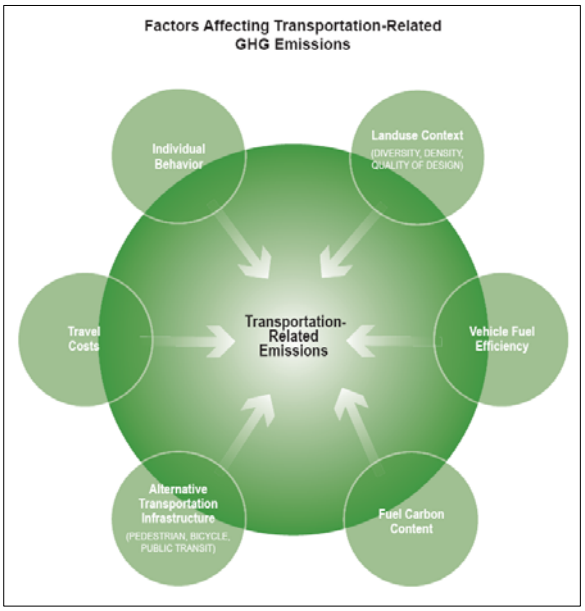
The way that land uses and transportation infrastructure are arranged within a community has a strong influence on whether residents choose to walk, bike, use public transit, or drive. These travel choices directly affect the amount of transportation-related GHG emissions produced in Albany. Single-passenger automobile trips generate substantially more GHG emissions per mile than public transit and carpooling. Walking and biking are GHG-free transportation alternatives. The Transportation and Land Use Strategy provides a variety of measures that strive to increase resident use of alternative travel modes and reduce automobile dependence in Albany.

Background

According to the 2000 U.S. Census, 59% of Albany residents drove alone to work, 12% carpooled, 19% rode public transit, 4% walked, and 4% biked to work. While alternative travel modes make up a notable share of commute trips in Albany, single-passenger automobile trips constitute the vast majority. Additionally, the majority of Climate Action Survey respondents stated that they drive to purchase daily goods and services. Combined commuting and shopping trips constitute the majority of a household's annual vehicle trips and generate a large portion of the community's transportation-related GHG emissions.

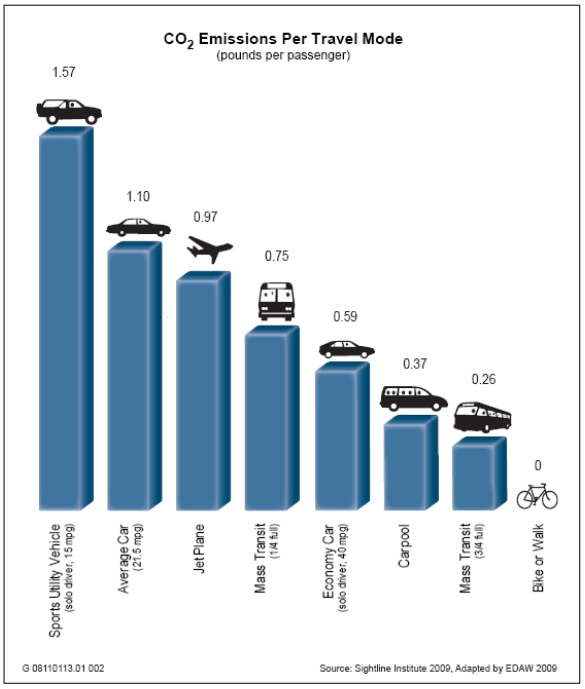
Examining Albany's existing land use pattern and transportation infrastructure provides insight into ways the community can reduce GHG emissions. A variety of land use, transportation, and urban design factors affect travel behavior. By making subtle land use changes and improving transportation infrastructure, Albany can increase walking, bicycling, and transit use. Factors most directly influencing travel behavior in Albany include: diversity of uses, proximity of uses, density, pedestrian and bicycle conditions, transit accessibility, parking, and streetscape design. Each of these is discussed in detail below.

Diversity of uses – *The degree to which residential, commercial, industrial, institutional, and recreational uses are located together.*



Increasing the diversity of neighborhood-serving, and specifically job-rich, uses within Albany could help reduce the community's transportation-related GHG emissions. Increased diversity reduces travel distances, and facilitates more walking and cycling trips. Improving the mix of uses within Albany can also reduce commute distances, particularly if affordably priced housing is located in areas with a high number of jobs and employees can commute to work using alternative modes.

A jobs/housing ratio is commonly used to evaluate the diversity of land uses within a community, by describing the relationship between employment opportunities and housing supply. A ratio of 1.0 describes a balance between jobs and housing. A ratio above 1.0 indicates that there are more jobs than housing, while a ratio below 1.0 describes an undersupply of jobs relative to housing. In 2005, there were approximately 5,000 jobs and 7,000 households in Albany and the jobs/housing ratio was approximately 0.7. This demonstrates that there are considerably fewer jobs than housing opportunities within the City, and that many Albany residents commute to other communities for employment.

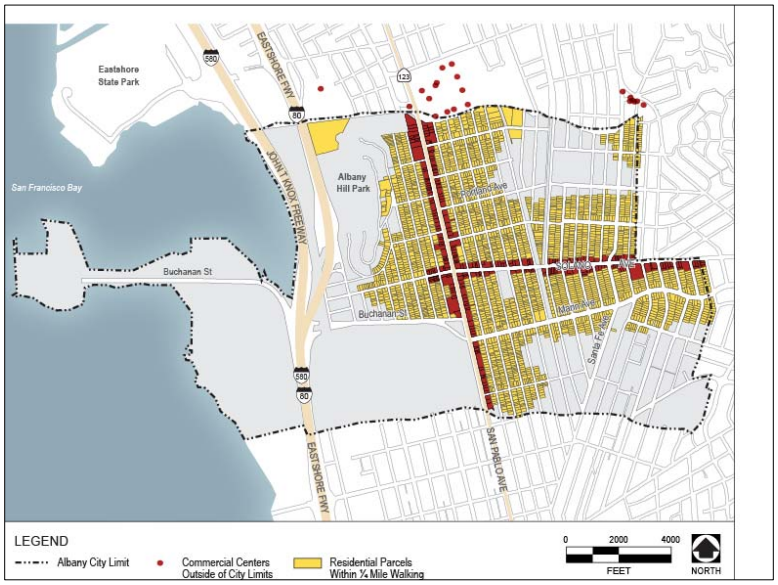


An improved jobs/housing ratio does not guarantee that residents will work within the city, but it does increase the likelihood that residents will have employment opportunities within the community. Thus, Albany's employment development efforts should strive to create jobs that match the skills and income needs of the community's labor force. Increasing the diversity of uses and particularly job-rich land uses may help reduce the community's automobile-generated GHG emissions.

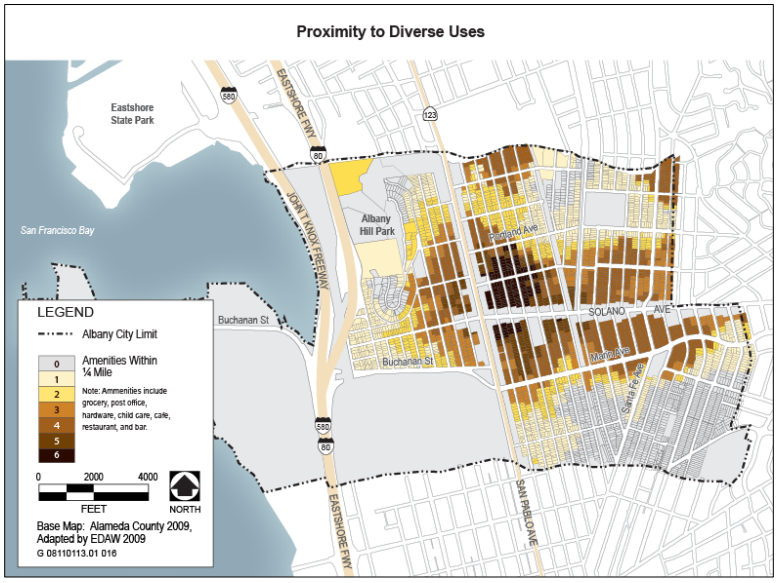
Proximity of uses – *The distance between neighborhood commercial services and residents' homes.*

Urban design research demonstrates that most people will walk to destinations that are within ¼ mile or a 5-minute leisurely walk. Neighborhoods are considered to be pedestrian-friendly if residents' homes are within ¼ mile of a diverse array of commercial and civic uses. Two methods of spatial analysis were used to evaluate the proximity of residences to commercial uses in Albany and support the development of CAP measures. The first measured proximity of residences to commercial centers and the second measured proximity of residences to a diversity of uses.

The first method examined how many residential parcels are located within ¼ mile of commercial districts and provides insight into the effectiveness of the City's existing zoning and land use pattern from the pedestrian perspective. This analysis found that 64% of Albany's residential parcels are located within ¼ mile of the neighborhood-serving commercial centers on Solano and San Pablo Avenues and those in adjacent cities. Although some residential portions of Albany are distant from commercial services; overall, the City's existing land use pattern creates many opportunities for pedestrian and bicycle travel.



While this may be the case, results from the Climate Action Survey indicate that most respondents do not walk or bike when purchasing daily goods and services. The second method of proximity analysis may explain this behavior as it demonstrates that many Albany residents do not have an adequate number of stores or services within easy walking distance of their homes. The analysis identified eight categories of neighborhood services (i.e., grocery stores, post offices, hardware stores, restaurants, bars, cafés, and child care providers), mapped all the locations of these services within Albany and adjacent cities, and then examined how many of these distinct uses are within a ¼ mile walking distance of individual residential parcels.



The analysis indicates that only 42% of residential parcels are located within ¼ mile of three or more amenities and only 30% are located near four or more. Residents living near the intersection of Solano and San Pablo Avenues have the highest level of access to diverse uses; residents in other areas of the City have access to few or none. Residents with low levels of pedestrian access to neighborhood-serving uses are more likely to drive to purchase their daily goods and services. City-directed land use and zoning changes, small business loans and other incentives could help improve the proximity to diverse uses. These actions could encourage pedestrian travel and reduce automobile dependence in Albany.

Density – *The number of housing units, people, or jobs in a given area.*

Higher densities tend to increase the number of services, shops, schools, and public buildings located within a neighborhood and increase the availability of transit and pedestrian infrastructure. These conditions tend to reduce the need for vehicle ownership and increase the use of alternative modes.

Residential Density

Residential density is normally measured in terms of housing units per acre. Albany has a relatively high residential density for a predominantly residential suburban community. Approximately 80% of the City's residential land use consists of single-family housing built on small parcels at an average density of about 12 units per acre. Approximately 5% of the City's residential land use is made up of medium density residential uses (17 to 34 dwelling units/acre) and 15% consists of high density multifamily uses (17 to 63 dwelling units/acre).

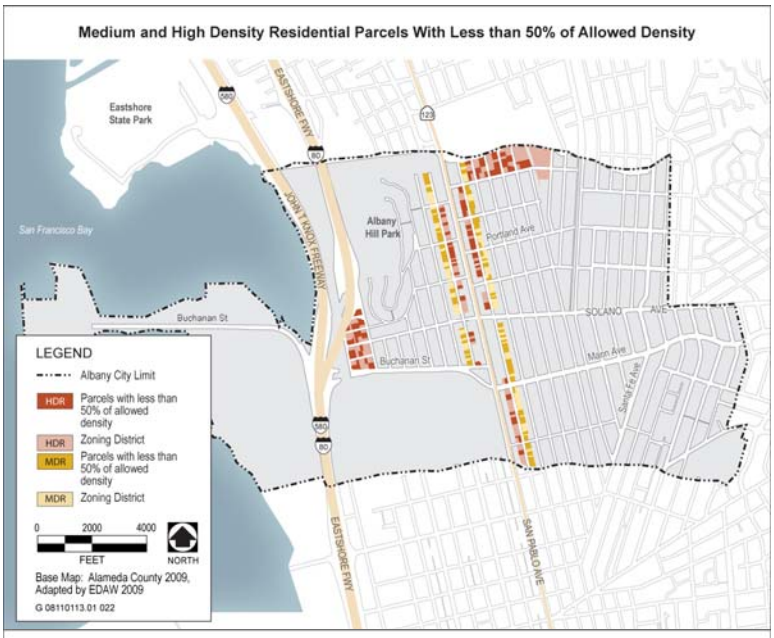
The highest density area is located in the northwest portion of Albany Hill adjacent to Interstate (I)-80, where high-rise residential towers are located.

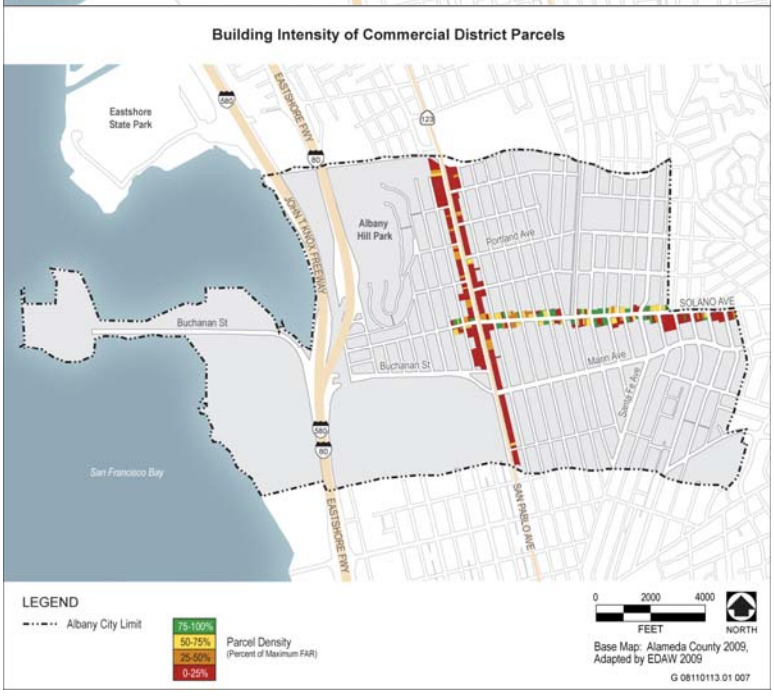
Infill development potential exists in the medium and high density residential districts parallel to San Pablo Avenue. Many of the parcels in these districts have existing densities well below those allowed in the current General Plan and Zoning Code.

Commercial Intensity

Commercial building intensity is measured using a floor-area ratio (FAR), which is obtained by dividing a building's floor area by the underlying parcel's area. The San Pablo Avenue Commercial District has a maximum allowable FAR of 2.25 for mixed-use structures and 0.95 for commercial-only structures. The Solano Avenue Commercial District has a maximum FAR of 1.25 for mixed-use or commercial structures. Currently, no minimum FAR standard exists within either district.

Many parcels in the commercial districts are built below the allowed intensities. In the San Pablo Commercial District more than two thirds of the buildings have been developed at less than 25% of the allowed FAR.





Pedestrian and bicycle conditions – *The quantity and quality of sidewalks, crosswalks, paths and bike lanes, and the level of pedestrian security.*

Well-developed pedestrian and bicycle infrastructure and pedestrian-friendly design are essential if walking and biking are to be important travel modes in a community. Highly connected sidewalks and bicycle infrastructure reduce travel distances between destinations and improve access and safety. Pedestrian and bicycle infrastructure includes sidewalks, crosswalks, traffic calming devices, bike lanes, and racks/storage facilities.

Pedestrian Infrastructure

Albany's pedestrian infrastructure is moderately developed. Though the City has a nearly complete sidewalk network, considerable pedestrian obstacles remain. A number of City sidewalks are in poor condition and others lack sidewalk cuts. These conditions create difficulties for strollers and the less physically-able and barriers for the physically disabled. Striped crosswalks are present on arterials and streets near schools, but there is little use of traffic calming devices such as bulb outs, refuge islands, and chokers. Between 2003 and 2007, the highest concentration of pedestrian collisions in Albany occurred on Solano Avenue (see Table III-6).

Bicycle Infrastructure

Albany's existing bike infrastructure and network are minimal, covering only 10% of the mileage of City streets. Class I bike paths are located west of Golden Gate Fields, and adjacent to Masonic Avenue, Buchanan Avenue, and I-580. Class II bike lanes are located on Marin Avenue, and Class III bike routes are present on Pierce Street and Santa Fe Avenue. Between 2003 and 2007, cycling accidents occurred most frequently on the City's arterial and collector streets that do not feature bicycle infrastructure (See Table III-6).

Bike racks can be found in various parts of the City, but shortages exist near civic and commercial uses, which may limit residents' desire to bike to these locations. Additionally, bike racks are often not provided in conjunction with bus stops.

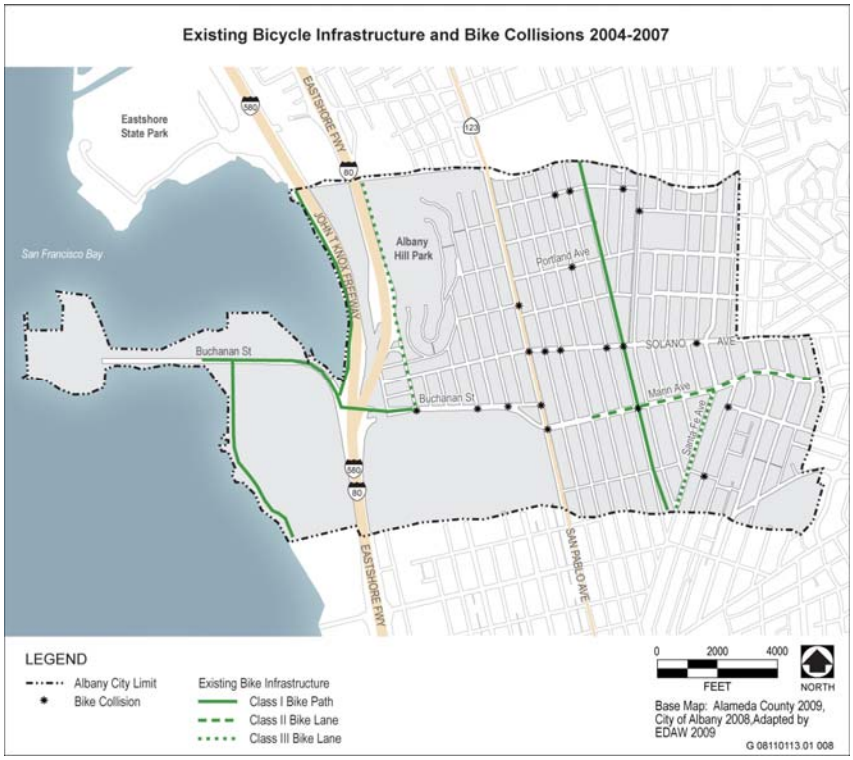


Table III-8. Albany Pedestrian and Bicycle Collision Data 2003-2007			
Street	Street Class	Number of Accidents	
		Pedestrian	Bicycle
Solano Avenue	Major Arterial	11	6
San Pablo Avenue	Major Arterial	3	3
Buchanan Street	Major Arterial	0	3
Marin Avenue	Major Arterial	3	1
Key Route	Minor Arterial	0	2
Portland Avenue	Collector	2	1
Brighton Avenue	Local	2	3
Curtis Street	Local	2	2
Cornell Avenue	Local	1	0
Neilson Street	Local	1	0
Pierce Street	Local	1	0

Source: City of Albany 2009

Transit accessibility – *The ease with which people can access transit service and the quality of that service.*

Residents and employees are more likely to use transit if traveling by bus or train is relatively time-competitive with driving, if transit stations are accessible to pedestrian and cyclists, and if the transit experience is pleasant. People are generally willing to walk ½-mile to a light rail station or ¼-mile to a bus stop. A ¼-mile walk takes the average person around 10 minutes. In Albany, about 75% of residential parcels are located within ¼ mile of a bus station or ½ mile of a BART station.

The City is currently served by 11 local and express AC transit routes serving the East Bay and San Francisco.

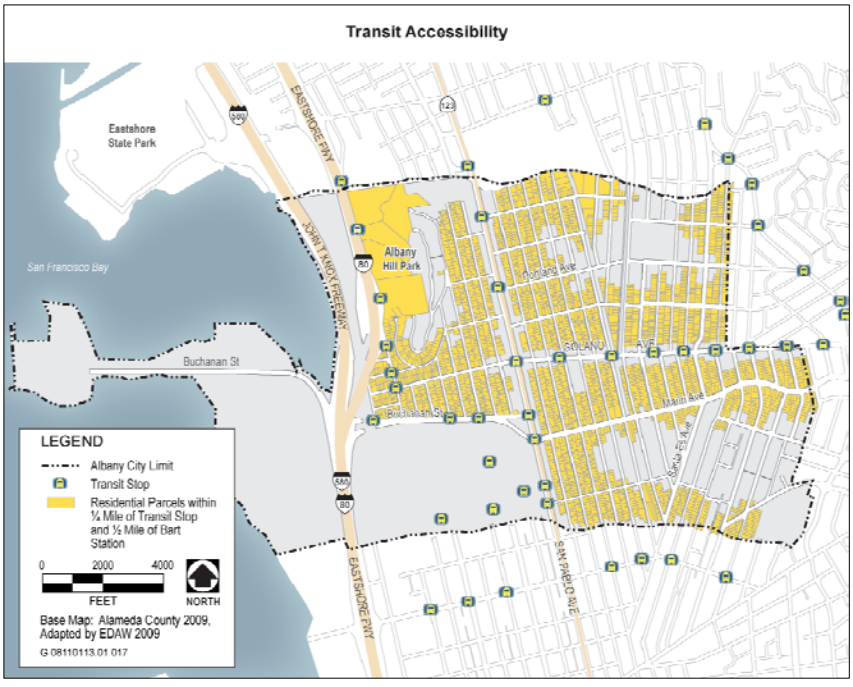


Table III-9.
AC Transit Bus Routes with Service in or Adjacent to Albany

Route	From	To	Weekdays			Weekends	
			Operating Hours	Headway (minutes)		Operating Hours	Headway (minutes)
				Peak	Mid-day		Peak
G	El Cerrito	San Francisco	5:45–8:30am 4:00–8:00pm	30		No Weekend Service	
18	Albany	Montclair	5:00–12:00am	15	30	6:00–12:00am	20
L	San Pablo	San Francisco	5:45–8:45am 3:30–9:30pm	20		No Weekend Service	
52L	El Cerrito	UC Berkeley	6:30–12:00am	30		7:00–12:00am	30
Z	Albany	San Francisco	7:30–9:00am 4:30–6:15pm	20–35		No Weekend Service	
72/72M	Richmond	Oakland	4:15–12:30am	15		5:15–1:00am	15–30
72R	San Pablo	San Francisco	6:15am–8:00pm	12–15		No Weekend Service	
79	El Cerrito	Berkeley	6:00am–10:30pm	30		6:15am–10:30pm	30
H	Richmond	San Francisco	6:15–8:45pm 4:30–8:45pm	20		No Weekend Service	
9	Berkeley Marina	7:00am–9:00pm	7:00am–9:00pm	20		7:00am–8:45pm	30
800	Richmond	San Francisco	1:00–6:00am	60		1:00–6:00am	60

Parking – T*he supply, price, and regulation of parking facilities.*

Cheap and abundant parking increases automobile ownership and use. Large parking lots also disperse destinations and reduce walking and public transit convenience and use. Parking management and fees can reverse the equation, reducing driving and increasing use of other travel modes.

Parking on all Albany streets is free; however to provide for reasonable turnover, parking in the downtown area is time limited. Most parking spaces on San Pablo Avenue and Solano Avenue have 90 minute limits. Relatively few large parking lots are located in the San Pablo Commercial and Solano Commercial zoning districts.

Streetscape design – *The scale and design of* streets*, sidewalks, and adjacent uses.*

Urban design research demonstrates that people walk more and drive less in pedestrian-oriented commercial districts than in automobile-dominated commercial centers. Street designs that reduce vehicle traffic speeds, improve walking and cycling conditions, and enhance the pedestrian experience encourage use of alternative modes.

Recent improvements on Solano Avenue west of Masonic Avenue and east of San Pablo Avenue have introduced a variety of pedestrian-friendly design features to Albany, including widened sidewalks, street trees, benches, decorative street lights, and bulb-out pedestrian crossings. San Pablo Avenue has not benefited from the same level of improvement and remains an automobile-dominated environment.

Transportation and Land Use Objectives and Measures

Objective TL-1:

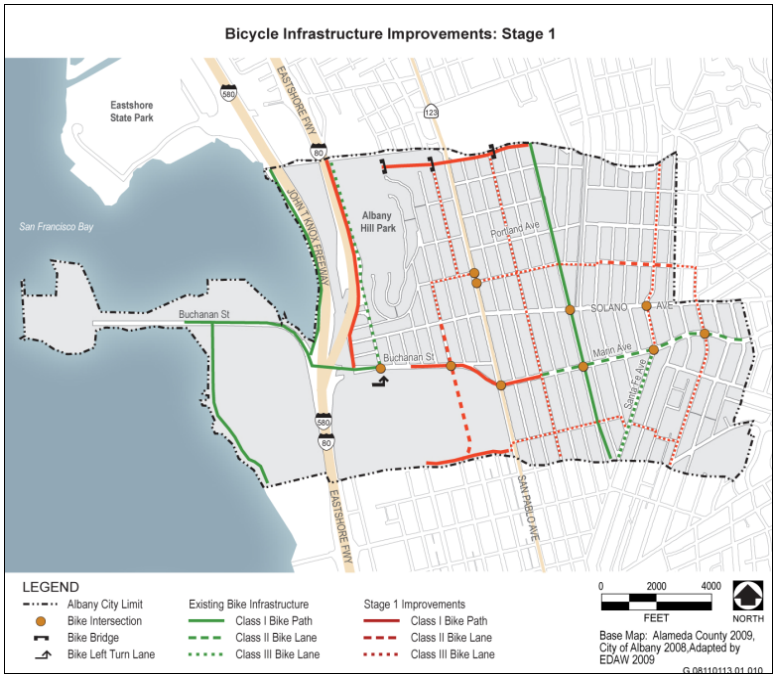
Facilitate Walking and Biking in the Community

Walking and biking do not generate GHG emissions. To encourage residents to shift from their cars to these alternative travel modes, two essential elements are needed: a) safe and convenient pedestrian and bike routes, and b) a diversity of uses within a short distance of residents' homes. The following measures encourage increased walking and biking in Albany by investing in infrastructure, enforcing existing laws, and creating incentives to attract additional neighborhood-serving commercial uses.

Measure TL 1.1: Expand and enhance bicycle infrastructure throughout the City.

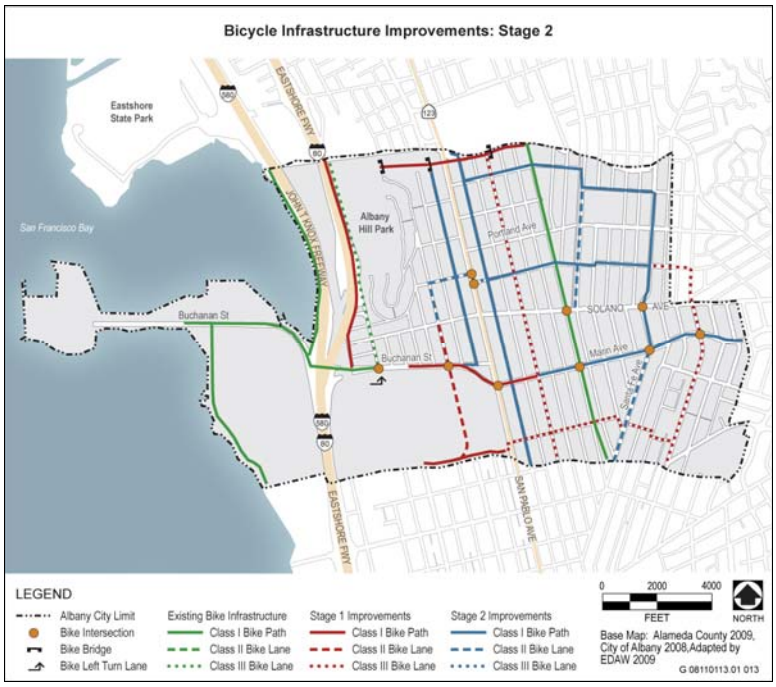
Albany currently contains a limited bicycle infrastructure network. Expanding and enhancing the bicycle network will help reduce GHG emissions, enhance mobility for all ages and abilities, and increase the health and fitness of Albany residents.

Proposed bicycle infrastructure improvements will be based on street types and existing characteristics. Bicycle infrastructure improvements will include development of bike paths, cycletracks, class II bike lanes, bicycle-friendly intersections, and signs to improve cyclist safety. Streets with higher traffic volumes will include cycle tracks, bike lanes, or bicycle intersections. Lower volume residential streets will be subject to minor improvements, such as signs and traffic calming features.



Measure TL 1.1: Expand and enhance bicycle infrastructure throughout the City.

Understanding that bicycle infrastructure improvements can be expensive; this important objective will be accomplished in stages. An important first stage will be to implement the bike infrastructure improvements contained in the current Bicycle Master Plan. A second stage of improvements will be made in phases as funding becomes available, with the goal of providing a seamless bicycle network throughout the City. An example of potential second stage bicycle infrastructure improvements is provided below.



GHG Reduction Potential (MT CO2e)	Cost to City	Cost Per Metric Ton	Private Cost
Stage 1: 110 Stage 2: 305 (total)	Stage 1: $976,000 Stage 2: $2,706,000	Stage 1: $8,900 Stage 2: $8,900	No

	Action	Timetables	Responsibility
A	Revise standard street cross-sections within the General Plan Circulation Element to ensure that all roads accommodate the needs of pedestrians, bicyclists, public transit riders, and automobile drivers.	Before December 31, 2011	Planning & Zoning (General Plan Update)
B	Revise and adopt the Bicycle Master Plan to incorporate a wider extent of Complete Streets.	Before July 31, 2012	Planning & Zoning (General Plan Update)
C	Construct Stage 1 bicycle infrastructure improvements described in the current Bicycle Master Plan.	Before January 1, 2015	Transportation
D	Construct Stage 2 bicycle infrastructure improvements.	To be phased in as funds become available.	Transportation

	Progress Indicators	Target
i	Bicycle network coverage.	30% bicycle network coverage by 2015 90% bicycle network coverage by 2020
iii	Walking and bicycling mode share of commute trips.	15% combined by 2020

Measure TL 1.2: Install bike racks in commercial and civic areas of the City where racks do not currently exist.

Bike racks are essential to encourage bicycle ridership for commuting and daily shopping/errand running trips. The City will identify commercial and civic areas that lack appropriate levels of bicycle parking and will install the needed facilities. The City will also require new development to provide adequate bicycle parking for tenants and customers. Businesses with more than 50 employees will be required to provide end-of-trip facilities including showers, lockers, and Class I covered bicycle storage facilities.

GHG Reduction Potential (MT CO_2e)	Cost to City	Cost Per Metric Ton	Private Cost
230	$2,000	$9	No

	Action	Timetables	Responsibility
A	Conduct bicycle parking analysis in City's commercial and civic areas.	Before December 31, 2011	Transportation
B	Install bicycle parking facilities in underserved areas (20% of total to be Class I or II bicycle parking facilities).	Before July 31, 2012	Transportation
C	Adopt ordinance that requires new development to provide adequate bicycle parking for tenants and customers; and requires businesses with more than 50 employees to provide end-of trip facilities including showers, lockers, and Class I bicycle storage facilities.	Before July 31, 2012	City Council Transportation

	Progress Indicators	Target
i	Bicycle parking-to-auto parking ratio.	50% bicycle parking by 2015 100% bicycle parking by 2020
ii	Percentage of businesses with over 50 employees with end-of-trip facilities.	100% by 2020

Measure TL 1.3: Evaluate the community's walking infrastructure, identify potential barriers, and implement improvements.

The City will prepare and adopt a Walking Master Plan. As part of the planning process, the City will conduct a study of existing obstacles that discourage walking in the community. Obstacles such as deteriorated sidewalks, vehicles or vegetation blocking walking paths, sidewalk segments without curb-cuts, debris on streets, and poor intersection design , which discourages walking within the community. The obstacle study will identify existing barriers and help the City prioritize facility improvements and code enforcement activities.

The City will construct walking infrastructure improvements identified in the obstacle study and Walking Master Plan as funds become available. Improvements will consist of additional crosswalks, sidewalk cuts, and traffic calming elements. Streetscape upgrades will be focused in the San Pablo and Solano Avenue commercial districts and traffic calming features will be installed throughout the City.

GHG Reduction Potential (MT CO_2e)	Cost to City	Cost Per Metric Ton	Private Cost
610	$249,000	$410	No

Measure TL 1.3: Evaluate the community's walking infrastructure, identify potential barriers, and implement improvements.

Action		Timetables	Responsibility
A	Conduct a pedestrian obstacle study.	Before September 1, 2010	Transportation
B	Prepare and adopt a Pedestrian Master Plan.	Before December 31, 2012	Planning & Zoning
C	Construct pedestrian improvements identified in the pedestrian obstacle study and Pedestrian Master Plan.	Before December 31, 2017	Transportation

Measure TL 1.4: Strictly enforce pedestrian rights laws on City streets.

The City of Albany will increase police enforcement of pedestrian rights laws such as mandatory stops for automobiles when pedestrians are attempting to cross at designated crosswalks. The City will also explore the use of additional signs to inform motorists of the existing laws.

GHG Reduction Potential (MT CO_2e)	Cost to City	Cost Per Metric Ton	Private Cost
Not quantified	$20,000	-	No

Measure TL 1.5: Encourage additional neighborhood-serving commercial uses and mixed-use development within the City's existing commercial districts. Strive to provide access to daily goods and services within ¼-mile of residences.

Increasing the diversity of neighborhood-serving uses within the existing commercial districts will reduce the number of vehicle trips and vehicle miles traveled within the community. The City will evaluate methods to increase the diversity of uses within its existing commercial centers. The City will develop small business incentive programs, and work with the business community to review land use, zoning, development standards, and other regulations and remove any unnecessary barriers that may impede the establishment of neighborhood-serving commercial uses. The City will coordinate these and other business development initiatives within a new Economic Development element in the General Plan.

GHG Reduction Potential (MT CO_2e)	Cost to City	Cost Per Metric Ton	Private Cost
1,150	$33,000	$30	No

Action		Timetables	Responsibility
A	Conduct study that examines methods to attract additional neighborhood-serving uses and mixed-use development to commercial districts.	Before December 31, 2011	Planning & Zoning (General Plan Update)
B	Develop small business incentive programs to encourage new neighborhood-serving uses.	Before December 31, 2012	Community Development

Measure TL 1.5:	Encourage additional neighborhood-serving commercial uses and mixed-use development within the City's existing commercial districts. Strive to provide access to daily goods and services within ¼-mile of residences.		
C	Conduct audit of land use, zoning, development standards, and other regulations that may act as barriers to neighborhood serving businesses and mixed-use development.	Before December 31, 2011	Planning & Zoning (General Plan Update)
D	Create new Economic Development element in General Plan.	Before December 31, 2011	Planning & Zoning (General Plan Update)
Progress Indicators		**Target**	
i	Percentage of residential parcels within ¼ mile of three or more neighborhood amenities.	55% by 2015 65% by 2020	

Objective TL-2:

Make Public Transit More Accessible and User-Friendly

Public transit generates 80% less GHG emissions than the average private automobile and 40% less than a fuel-efficient car (40 miles per gallon). For residents and employees to switch from automobiles to public transit, transit service needs to be convenient, comfortable, and reliable. The following measures seek to improve transit services and increase use of public transit travel modes.

Measure TL 2.1: Conduct a public transit gap study that analyzes strategies for increasing transit use within the City and identifies funding sources for transit improvements.

The City will work with AC Transit and conduct a public transit gap analysis to evaluate ways to increase transit ridership. The study will identify existing transit conditions and document deficiencies and opportunities for improvement. The study will provide the City and AC Transit with information needed to refine future transit investments and public outreach programs.

An existing known gap in the community's bus system is the lack of transit service to the regional commercial uses located on Eastshore Highway in western Albany. The City will work with AC Transit and property owners to extend Bus Line 18 to provide bus service to stores in that area.

GHG Reduction Potential (MT CO_2e)	Cost to City	Cost Per Metric Ton	Private Cost
Not quantified	$6,300	-	No

Measure TL 2.2: Work with AC transit to provide bus stops with safe and convenient bicycle and pedestrian access and essential improvements such as shelters, route information, benches, and lighting.

Improving the safety, comfort, and convenience of transit stations will encourage additional transit ridership in the community. The City will work with AC Transit to provide shade, weather protection, seating, lighting, and route information at all transit stops in the community. The City will also evaluate pedestrian and bicycle access to transit stations and work to remove existing barriers.

GHG Reduction Potential (MT CO_2e)	Cost to City	Cost Per Metric Ton	Private Cost
115	$20,000	$200	No

Action		Timetables	Responsibility
A	Consult with AC Transit to ensure Albany bus stops provide shade, weather protection, seating, lighting, and route information.	Before December 31, 2017	Transportation
B	Conduct a study of bicycle and pedestrian access to transit stations.	Before July 31, 2012	Transportation

Progress Indicators		Target
i	Percentage of bus stops with shade, weather protection, seating, lighting, and route information.	80% by 2015 100% by 2017

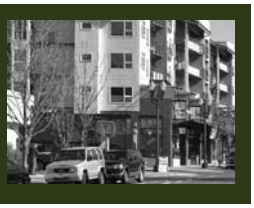
Measure TL 2.3: Provide passes and shuttles to transit to encourage use of alternative transportation by City employees.

The City of Albany employs approximately 130 people. A 2007 employee survey found that six percent of municipal employees currently ride public transit to work. Forty percent stated that if the City provided free passes they would use public transit for their commutes. The City will offer AC Transit and/or BART passes free of charge to all full-time City employees. If sufficient demand exists, the City will also provide employees with free morning and evening shuttles to the El Cerrito BART station.

GHG Reduction Potential (MT CO_2e)	Cost to City	Cost Per Metric Ton	Private Cost
11	$9,000	$820	No

Objective TL-3:

Promote Pedestrian- and Transit-Oriented Development



Pedestrian- and Transit-Oriented Development (PTOD) refers to mixed-use residential and commercial neighborhoods designed to maximize pedestrian mobility and transit access for residents, shoppers, and employees. People living and working in such areas tend to drive vehicles less often and therefore emit fewer GHGs than people living and working in more automobile-oriented areas. Many successful PTOD projects exist in the San Francisco Bay Area, including developments in Downtown Hayward and Redwood City. Though Albany does not have a major transit station within its borders, the City's proximity to the El Cerrito BART station, the

AC express bus line on San Pablo Avenue and the layout of existing commercial districts provide promising PTOD opportunities.

Encouraging mixed-use, pedestrian- and transit-oriented development along San Pablo Avenue and Solano Avenue could transform these commercial districts into vibrant transit corridors. Locating high quality residential development and a diversity of retail and commercial uses in these corridors will improve transit as additional residents, shoppers, and employees increase transit ridership and fare box revenue.

Albany encourages high density mixed-use development in both the San Pablo and Solano Commercial districts. The San Pablo district allows mixed use projects with a floor area ratio up to 2.25 and the Solano district allows floor area ratios up to 1.25. While these policies support PTOD, some of the City's current development standards, including parking requirements, height limits, and setback requirements establish barriers to such projects.

The following measures seek to remove barriers, create incentives, and stimulate public support for additional mixed-use pedestrian- and transit-oriented projects in Albany.

Measure TL 3.1: Provide public education about benefits of well-designed, higher-density housing and relationships between land use and transportation.

Achieving higher-density mixed-use development in the San Pablo Avenue and Solano Avenue Commercial zoning districts will require widespread community support. The City will consult with current residents, businesses, and property owners to build understanding about the benefits of well designed infill development. The City will also conduct workshops that aim to incorporate public input and concerns into the design of these areas.

GHG Reduction Potential (MT CO_2e)	Cost to City	Cost Per Metric Ton	Private Cost
70 (combined total for all education programs)	$2,700	$40	No

Action		Timetables	Responsibility
A	Develop comprehensive public outreach campaign that educates residents and businesses about ways to reduce GHG emissions.	Before July 31, 2010	Environmental Resources
B	Develop specific outreach program to inform residents, businesses, and property owners about the benefits of well designed infill development.	Before January 1, 2011 (Ongoing)	Environmental Resources
C	Conduct workshops that integrate public input and concerns into the infill development design process.	Before January 1, 2011 (Ongoing)	Planning & Zoning Environmental Resources
Progress Indicators		**Target**	
i	NA	NA	

Measure TL 3.2: Update planning documents to promote high-quality, mixed-use, pedestrian- and transit-oriented development in the San Pablo/Solano Commercial district.

To successfully encourage the development of high-quality mixed use pedestrian- and transit-oriented development along San Pablo Avenue and Solano Avenue, the City will revise existing development standards and design guidelines. The City will conduct a sustainability audit to identify additional regulatory, structural, or market barriers that may prevent or discourage sustainable, climate-friendly development within commercial and high density residential zoning districts.

Specifically, the City will reevaluate the residential and commercial parking requirements (Measure D) for commercial and high density residential uses. Building heights will comply with current code requirements. The City will also update the San Pablo Design Guidelines and the San Pablo Avenue Streetscape Master Plan in order to reflect a desire to create a mixed-use and pedestrian- and transit-oriented environment.

GHG Reduction Potential (MT CO_2e)	Cost to City	Cost Per Metric Ton	Private Cost
790	$3,800	$5	No

Action		Timetables	Responsibility
A	Conduct sustainability audit to identify regulatory, structural, or market barriers to sustainable, climate-friendly development within commercial and high density residential districts.	Before December 31, 2011	Planning & Zoning (General Plan Update)
B	Evaluate the residential and commercial parking requirements and the height and setback requirements for commercial and high density residential uses.	Before December 31, 2011	Planning & Zoning (General Plan Update)
C	Update the San Pablo Design Guidelines and San Pablo Streetscape Master Plan to reflect the City's desire to create a pedestrian- and transit-oriented environment.	Before January 1, 2013	Planning & Zoning

Progress Indicators		Target
i	Percentage of new development projects in San Pablo Commercial District that achieve a floor area ratio of 1.5 or higher (approximately 75% of maximum allowable FAR).	100% by 2020
ii	Percentage of new development projects in Solano Commercial District that achieve a floor area ratio of 0.95 or higher (approximately 75% of maximum allowable FAR).	100% by 2020

Measure TL 3.3: Evaluate GHG emissions associated with development proposals and work with applicants to reduce emissions during project review and incentivize projects that generate low levels of GHG emissions.

The City will employ tools to evaluate the GHG emission performance of proposed development projects (e.g. Urban Emissions Model [URBEMIS], Index). City staff will work with applicants to reduce GHG emissions through project design and mitigation during or prior to the project entitlement process.

Additionally, the City will provide incentives for infill development projects that result in low levels of GHG emissions. The City will explore establishment of a carbon feebate program, which establishes an emission target for new development

Measure TL 3.3: Evaluate GHG emissions associated with development proposals and work with applicants to reduce emissions during project review and incentivize projects that generate low levels of GHG emissions.

and charges fees to projects that produce higher than target emissions and provides financial incentives for projects that generate lower than target emissions.

The City would be able to capture most, if not all, of its up-front nexus study through an overhead for the application of the feebate program. The intent of the feebate program is not to pay for mitigations elsewhere in Albany, but rather to incentivize the project itself to incorporate more sustainable design elements that reduces its energy and water consumption.

GHG Reduction Potential (MT CO_2e)	Cost to City	Cost Per Metric Ton	Private Cost
Supporting measure (TL-3.2)	1k-45k	-	Yes

Objective TL-4:

Reduce Vehicle Emissions and Trips

To successfully reduce Albany's vehicle emissions, a variety of changes are required at the city, regional, state, and national levels. Vehicle GHG emissions are a function of vehicle miles traveled (VMT), vehicle efficiency, and the carbon content of a given fuel or alternative power source. While the City cannot control vehicle efficiency or fuel carbon content, the State and the federal government are both requiring considerable improvements in these areas. The City can incentivize the use of efficient vehicles, facilitate ridesharing, and increase the use of alternative travel modes. More fundamentally, the City can determine local land use and development patterns, which directly influence VMT. The following measures describe planned City efforts to reduce both vehicle emissions and trip lengths.

Measure TL 4.1: Work with ABAG and neighboring cities to improve the jobs-housing balance within the City and regional transit corridors.

Improving Albany's jobs/housing ratio will increase the number of employment opportunities in the City. This could create opportunities for shorter commutes for residents, reduce VMT, and increase residents' ability to walk or bicycle to work.

Communities with jobs/housing ratios close to 1.0 are considered balanced. In order to increase Albany's jobs/housing ratio from 0.7 to 0.8, approximately 1,100 jobs would need to be created by 2020. Association of Bay Area Governments (ABAG) employment projections indicate that approximately 600 jobs are likely to be created in this time period. In order to achieve an increase of 1,100 jobs, the City will increase employment development efforts. The City will also collaborate with neighboring cities to encourage job development opportunities in areas along existing public transit corridors accessible to Albany residents.

GHG Reduction Potential (MT CO_2e)	Cost to City	Cost Per Metric Ton	Private Cost
225	$1,300	$6	No

Measure TL 4.1:	Work with ABAG and neighboring cities to improve the jobs-housing balance within the City and regional transit corridors.		
Action		**Timetables**	**Responsibility**
A	Create an economic development program.	Before July 31, 2010	Community Development
B	Explore the redevelopment potential of Commercial Mixed Use District into a job-rich business park.	Before December 31, 2011	Planning & Zoning (General Plan Update)
C	Collaborate with neighboring communities to establish employment opportunities along transit corridors.	Before January 1, 2011	Planning & Zoning (General Plan Update)
Progress Indicators		**Target**	
i	Jobs/housing ratio.	0.70 by 2015 0.80 by 2020	

Measure TL 4.2: Improve fuel efficiency of the City vehicle fleet by purchasing low- or zero-emission vehicles when vehicles are retired from service.

The City will purchase highly efficient vehicle models when municipal fleet vehicles are retired. The City owns 28 gas- and diesel-powered vehicles. When retired, these will be replaced by zero- or low-emission models. Priority will be placed on plug-in electric vehicles when appropriate. Heavy-duty vehicles will be replaced by the most efficient and cost-effective vehicles suitable for the purpose. Emergency vehicles shall be exempt from this requirement.

GHG Reduction Potential (MT CO_2e)	Cost to City	Cost Per Metric Ton	Private Cost
19	$72,800	$3,800	No

Measure TL 4.3: Incentivize electric and plug-in hybrid vehicles through development of automobile charging infrastructure and preferential street parking spaces.

The City will facilitate the use of electric/plug-in hybrid vehicles within the community by providing charging infrastructure and preferential parking spaces. The City will work with property owners to develop electric plug-in charging infrastructure in commercial and civic areas. Ideally, this infrastructure will source a considerable portion of its electricity from solar energy generation facilities located within the City in order to create a zero emission vehicle infrastructure.

Preferential street parking spaces for electric and plug-in electric vehicles will encourage residents, employees, and visitors to purchase low- or zero-emission vehicles and therefore assist the City in its efforts to reduce transportation-related emissions. The City will provide preferential parking spaces for eligible vehicle types within commercial districts at a ratio of one preferential space per 5 unrestricted parking spaces. The City will maintain a list of preferential parking-eligible vehicles on its website. Other vehicles parked in the spaces will be ticketed. The City will require new retail and office developments with private parking lots to provide preferential parking spaces at the same ratio.

GHG Reduction Potential (MT CO_2e)	Cost to City	Cost Per Metric Ton	Private Cost
Not quantified	$1,300	-	No

Measure TL 4.4: Create and implement a voluntary transportation demand management (TDM) program to reduce weekday peak period single occupancy commute and school trips.

The City will establish a transportation demand management program to reduce single-occupancy automobile commute trips by at least 15% by 2020. In order to achieve this target, the City will facilitate establishment of an Albany Transportation Management Association (ATMA), a non-profit organization made up of Albany-based employers, whose primary purpose is to increase access and mobility to, from, and within the community for their employees. The ATMA will offer training seminars to help member employers develop effective commute option programs. Additionally, ATMA will provide members with benefits such as guaranteed ride-home services, rideshare databases, bulk transit pass purchases, and representation in local and regional transit/transportation planning processes. The City will attempt to partner with Berkeley and El Cerrito in developing this program in order to take advantage of scale efficiencies.

Additionally, the City will work with the ATMA, Metropolitan Transportation Commission (MTC) and other relevant agencies to maximize community participation in carpool and vanpool commuting. A core component of this effort will be the development of a social networking platform where residents and employees with similar commutes can find each other and create effective carpools. Additionally, the City will investigate the potential to create rideshare stations to facilitate resident participation in casual carpools.

A large portion of school children attending public and private schools in Albany are driven to school each day in private automobiles. The City will make essential infrastructure improvements to enable safe-routes-to-school. The City will also work with schools to create trip reduction programs that encourage walking, bicycling, carpooling, and public transit use. Specific attention will be placed on expanding the walking school bus programs throughout the community, where children walk to school in adult-supervised and school-coordinated groups.

The City will also work with the ATMA to conduct a variety of education and outreach programs aimed at reducing residents' transportation related emissions. Various media will be used to convey messages about alternative transportation options and climate-responsible vehicle purchasing. Targeted advertisement programs will be created to encourage walking and bicycling in the City. The City will partner with Carbon Neutral Albany, Strollers & Rollers, and other additional community based groups promoting climate action.

GHG Reduction Potential (MT CO_2e)	Cost to City	Cost Per Metric Ton	Private Cost
1,140	$10,000	$9	Yes

Action		Timetables	Responsibility
A	Develop and adopt a transportation demand management program to reduce single-occupancy automobile commute trips by 15% by 2020.	Before December 31, 2011	City Council Transportation
B	Facilitate the establishment of an Albany Transportation Management Association (ATMA) for community employers.	Before July 31, 2012	Transportation
C	Develop Albany-specific social networking platform to facilitate community participation in carpool and vanpool programs.	Before December 31, 2012	Transportation
D	Evaluate potential for rideshare stations in Albany.	Before December 31, 2012	Transportation
E	Work with schools to identify key infrastructure improvements and community outreach initiatives that would facilitate safe-routes-to-school and walking school bus programs.	Before July 31, 2011	Transportation

Measure TL 4.4:	Create and implement a voluntary transportation demand management (TDM) program to reduce weekday peak period single occupancy commute and school trips.		
F	Develop education and outreach programs aimed at reducing residents' transportation related emissions.	Ongoing	Transportation
Progress Indicators		**Target**	
i	Percent reduction in single-occupancy automobile commute trips.	15% reduction by 2015 20% reduction by 2020	
ii	Percentage of Albany employers with over 10 employees who belong to ATMA.	100% by 2015	

Measure TL 4.5:	Evaluate and consider implementation of community parking management strategies.		
Parking management includes strategies that influence the supply, price and regulation of parking facilities. Parking management can have a considerable effect on a community's travel behavior by reducing driving and increasing use of other travel modes. The City will evaluate parking management strategies that have the potential to reduce automobile trips or enable the development of bicycling and walking infrastructure (e.g., bike lanes, traffic-calming measures).			
GHG Reduction Potential (MT CO_2e)	**Cost to City**	**Cost Per Metric Ton**	**Private Cost**
Not quantified	$6,300	-	No

Objective TL-5:

Prepare for Peak Oil

Synergies exist between Albany's need to reduce GHG emissions for climate protection purposes and the need to guard the community from the potential impacts of peak oil. For decades, theorists have predicted that there will be a point in time when global petroleum extraction achieves a maximum, or peak, level. In this scenario global petroleum demand would outstrip production and the resulting shortage could lead to rapid price escalation, and creating havoc for a global economy that relies heavily on fossil fuels. In 2005, the United States Department of Energy (DOE) released a comprehensive report that validates many of these concerns and indicates that such a scenario is likely to occur within the next half-century, though the precise timing remains uncertain (DOE, 2005).

Increased fuel prices and reduced supply could considerably affect Albany residents and businesses. Potential effects could include higher transportation, food, heating, and other costs. Notably, private automobile travel costs may increase, affecting mobility options.

Fortunately, many of the measures proposed to reduce GHG emissions will also help the community prepare for peak oil. While climate change and peak oil are distinct issues, together they may provide a united urgency to inspire investments in alternative transportation infrastructure and support pedestrian- and transit-oriented development.

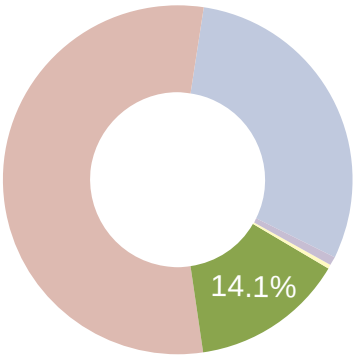
Measure TL 5.1:	Conduct a study of the potential effects of peak oil on the community and develop a peak oil adaptation plan.

The City will develop a comprehensive plan to prepare the community for potential effects of peak oil. The City will establish a specific task force to assess the community's vulnerability to peak oil and recommend specific actions. The task force will specifically look for strategies that can help reduce the effects of peak oil and reduce community GHGs.

GHG Reduction Potential (MT CO_2e)	Cost to City	Cost Per Metric Ton	Private Cost
Not included in inventory	$1,300	-	Yes

Waste Reduction Strategy

Minimize waste.



Total GHG Emissions Reduced:
2,210 Metric Tons

Objectives:
WR-1: Become a Zero-Waste Community - 100%

While waste comprises only 5% of Albany's baseline GHG inventory compared to transportation or building energy, the City and the Alameda County Waste Management Authority and Source Reduction and Recycling Board (operating together as StopWaste.org) can eliminate most waste-related emissions by 2030.

Background

How waste generates GHG emissions

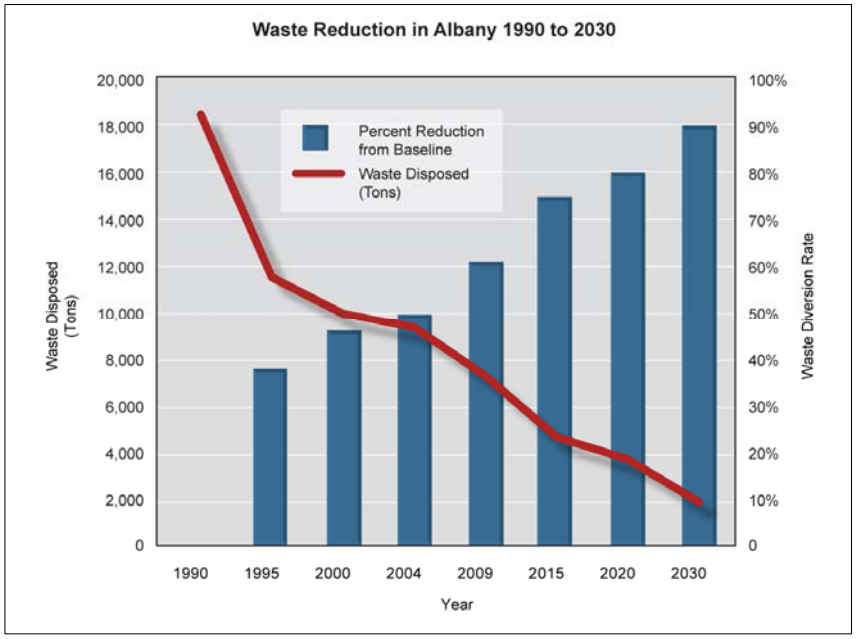
In nature, waste is comprised of food and nutrients flowing in a cyclical pattern. When a leaf falls from a tree to the forest floor it becomes food for insects and microbes, and eventually turns back into nutrients for new plant growth. In modern times, humans have established linear waste flows where materials are extracted, processed, used, and then discarded into landfills or incinerated. These linear waste flows create GHG emissions in three ways:

- **Landfills:** Each year, Americans throw away 84.2 million tons of biodegradable food scraps, yard trimmings and paper products (EPA 2006). These organic materials breakdown in anaerobic landfills and emit methane, a potent GHG.
- **Waste incineration:** Americans burn 31.4 million tons of municipal solid waste annually (EPA 2006). While most waste incinerators also produce electricity, they emit considerably more CO_2 per megawatt hour than fossil fuel power plants.
- **Lifecycle considerations:** Each year Americans bury or burn 123 million tons of manufactured commodities such as paper, metals, plastics, and glass. Instead of reusing these discarded materials, virgin materials are mined or harvested to produce the next round of consumable goods. Continuous consumption of virgin materials requires tremendous amounts of energy. The lifecycle energy invested in extracting and processing virgin materials is responsible for a large amount of GHG emissions. In addition to being energy intensive, the extraction of virgin materials is one of the main causes of deforestation, which accounts for as much as 30% of global GHG emissions.

Only landfill-generated emissions are included within Albany's 2005 baseline inventory and contribute to the City's reduction goals. While reducing lifecycle emissions is critically important to addressing climate change, the City will not be able to take credit for actions that reduce these emissions.

Waste Reduction in Albany

In 1989, the California State legislature signed the Integrated Waste Management Act (AB 939) into law, mandating cities and counties to divert 50% of their waste flows from disposal by 2000. Since 1976, StopWaste.org has been a national leader in waste reduction and diversion. In cooperation with Alameda County, the City has taken meaningful steps to reduce waste generation over the past two decades. In 1990, Albany landfilled approximately 18,500 tons of garbage. By 2004, the City had reduced this to 9,300 tons, achieving the 50% reduction from 1990 levels.



In 2007, the City established a 75% waste reduction goal for 2010. Between 2004 and 2009, Albany eliminated an additional 2,100 tons and achieved a 61% reduction below 1990 levels. The 2004 to 2009 reductions have removed approximately 840 MT of GHG emissions from the City's baseline GHG inventory. These reductions have been counted as an achievement toward the City's GHG reduction target.

Toward Zero Waste

Looking ahead, leading waste management experts envision a future where society produces zero waste. In this future, all synthetic materials are recycled over and over again as the same material and all biological materials are composted and returned to the soil. If we successfully transition to producing zero waste, landfills and incineration would become essentially obsolete. Lifecycle considerations would also decrease as the extraction of virgin materials greatly decreases. Waste-related GHG emissions would be considerably reduced.

While the technical capacity to reduce waste generation by 90% in a cost-effective manner exists, implementation may take more than a decade. If Albany were to increase recycling, composting, and source reduction at a rate of one percent per year, an 80% reduction in waste generation could be achieved by 2020, and a 90% reduction could be achieved by 2030.

Consumer Choice and Behavior

As consumers of goods and services, we can all play an important role in reducing GHG emissions. The amount and types of things we consume greatly determines our personal impact on the climate. Lowering our consumption levels and purchasing climate-friendly products can substantially reduce individual GHG emissions.

The simplest way to reduce personal emissions is to consume less. Almost everything we buy generates emissions as it is transformed from raw material into a finished product. By not purchasing a product, we eliminate the energy consumption and other environmental effects associated with activities such as mining, manufacturing, transporting, and marketing.

When we do decide to purchase a product or service, selecting a climate-friendly alternative can help reduce associated GHG emissions. Selecting a product with low embodied emissions takes some effort, but information to help consumers make informed choices is increasingly available. Reusing or purchasing secondhand items is also a great way to reduce GHG emissions. Sharing goods with friends and neighbors is another way to reduce both GHG emissions and cost.

At stated above, most lifecycle emissions were not included in Albany's 2005 baseline emissions inventory. For this reason the City cannot apply lifecycle emissions reductions to the achievement of the 2020 target. While this is the case, this does not diminish the importance of reducing consumption and purchasing climate-friendly products.

Objective WR-1:

Become a Zero-Waste Community

Albany recognizes that moving to a zero-waste culture is a critical step toward reducing a wide range of environmental effects, including the community's GHG emissions. The City's waste reduction measures build on existing efforts and focus on reducing GHG emissions by eliminating waste at its source while also maximizing recycling and composting in homes, businesses, and civic institutions.

Expanded waste prevention and recycling programs will make important contributions to reducing energy needs for manufacturing, packaging, and shipping virgin products. Expanded composting programs will reduce methane produced in landfills and improve the productivity of local agriculture. Albany will join other cities to

encourage the State and the federal government to adopt extended producer responsibility legislation that holds manufacturers accountable for their products and packaging through their full lifecycle. Manufacturers would, in turn, design products from materials that can be easily recycled or composted. Successful extended producer responsibility legislation is critical to achieving Albany's zero-waste goal. Well-informed consumers can considerably reduce the lifecycle GHG emissions associated with the goods and services they purchase. The City will create educational programs that raise awareness about products total carbon footprint. The City will also promote reuse and sharing of goods within the community.

Measure WR 1.1: Establish a citywide zero-waste target for 2030.

The City will adopt a resolution to achieve 90% waste diversion by 2030. Achieving this aggressive target will require full participation from residents and businesses and collaboration with StopWaste.org and neighboring cities. The 2008 Stopwaste.org Waste Characterization Study identified that a significant amount of organics, compostable paper, and plastics are being disposed of as trash. The City will adopt ordinances and conduct a variety of outreach programs to increase community participation in waste reduction, recycling, and composting programs.

The City will place special focus on the diversion of food waste and other organic materials the primary source of landfill methane emissions. The City will adopt an ordinance requiring all household and commercial food scraps and food soiled paper to be placed in organics carts, and all commercial food service providers to use both recycling and organics services. EBMUD currently uses food waste to produce biogas at its West Oakland wastewater treatment facility. The biogas produced provides a portion of the plant's energy. The City of Berkeley is actively developing a food industry grease-to-biodiesel processing program. The City of Albany will partner with these agencies to establish a viable food waste-to-bioenergy program for restaurants, caterers, and related businesses.

The City will adopt an ordinance that requires the waste collection contractor to minimize collection route distances and use fuel-efficient vehicles, an ordinance requiring a disposable shopping bag fee, and an ordinance that directs the City to eliminate all unnecessary paper use in municipal operations. The City will also consider establishing a trash tax on the volume of waste collected to help fund a high level of waste reduction in the city.

Outreach programs will focus on raising consumer awareness about low carbon product alternatives, reducing unnecessary consumption, and promoting the reuse and sharing of goods within the community. The City will make efforts to increase resident's awareness about alternative products that are produced using renewable energy, sustainable forest management practices, and materials and processes with low embodied energy. Albany will continue the community garage sale and support the establishment of a used-goods retail or exchange facility within Albany.

Furthermore, the City will urge the State and the federal government to pass legislation that requires extended producer responsibility and improves the recyclability of products and packaging.

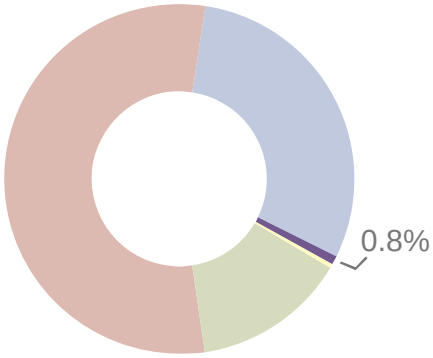
GHG Reduction Potential (MT CO_2e)	Cost to City	Cost Per Metric Ton	Private Cost
2,210 Metric Tons (2004 to 2020)	$1,300	$1	No

	Action	Timetables	Responsibility
A	Adopt a resolution to achieve 90% waste diversion by 2030.	Before December 31, 2011	City Council Environmental Resources
B	Adopt an ordinance that requires all household and commercial food scraps and food-soiled paper to be placed in organics carts, all commercial food service providers to use recycling and organics services.	Before December 31, 2010	City Council Environmental Resources
C	Adopt an ordinance that requires the City's waste collector to minimize collection route distances and use fuel efficient vehicles.	Before December 31, 2010	City Council Environmental Resources

Measure WR 1.1:	Establish a citywide zero-waste target for 2030.		
D	Expand outreach programs to maximize participation in waste reduction and diversion programs and increase consumer awareness about low carbon products and opportunities for reuse of goods in the community.	Before July 31, 2011	Environmental Resources
E	Adopt an ordinance that requires a disposable shopping bag fee.	Before December 31, 2010	City Council Environmental Resources
F	Adopt a resolution of support that encourages the State and federal governments to create a voluntary *Do Not Mail Registry* to reduce junk mail deliveries.	Before July 31, 2010	City Council Environmental Resources
G	Develop a resolution of support to encourage the State and the federal government to pass legislation that requires extended producer responsibility and improves recyclability of products and packaging.	Before December 31, 2010	City Council Environmental Resources
Progress Indicators		**Target**	
i	Community waste diversion rate	75% by 2015 80% by 2020 90% by 2030	

Green Infrastructure Strategy

Enhance natural assets that improve community quality of life.



Total GHG Emissions Reduced:
130 Metric Tons

Objectives:

GI-1: Expand and Enhance City's Green Infrastructure - 100%

Green infrastructure refers to a wide variety of natural features that, when integrated within an urban environment, provide valuable ecosystem services to the community. In Albany, green infrastructure includes the urban forest, bayshore and riparian habitat areas, and other natural stormwater-absorbing landscapes. Green infrastructure benefits the City by improving local energy security, stormwater and waste management, and public health. The measures contained within this strategy describe green infrastructure improvements capable of reducing GHG emissions or sequestering carbon within plant biomass.

Background

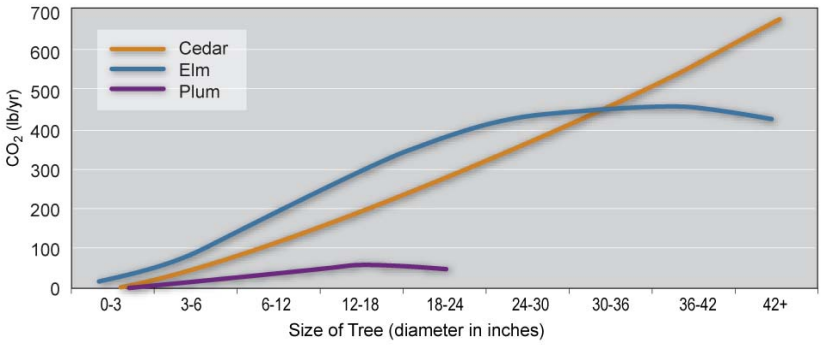
Albany's Urban Forest

The City recognizes trees as a valuable asset. Albany has established an Urban Forestry Program to plant and maintain trees on public lands and rights-of-way. Trees beautify neighborhoods, increase property values, reduce noise and air pollution, keep buildings cool in the summer, create privacy, and establish habitat for bird species. Importantly, the urban forest also sequesters carbon as the trees grow.

Considerable variations in tree canopy coverage are found in different portions of the City. Areas with moderate canopy coverage include the Albany Hill area, parks, and in residential neighborhoods in the eastern and southeastern portions of Albany. Canopy coverage is generally lacking along San Pablo Avenue and in adjacent neighborhoods. This and many other areas of the City would benefit from additional tree plantings.

The City estimates that the Urban Forestry Program currently plants approximately 150 trees per year. Program staff have identified that a large number of potential tree planting sites exist within the City, and that with additional funding, Albany's urban forest could be considerably enhanced.

Annual Sequestration of Carbon Dioxide of Three Tree Species



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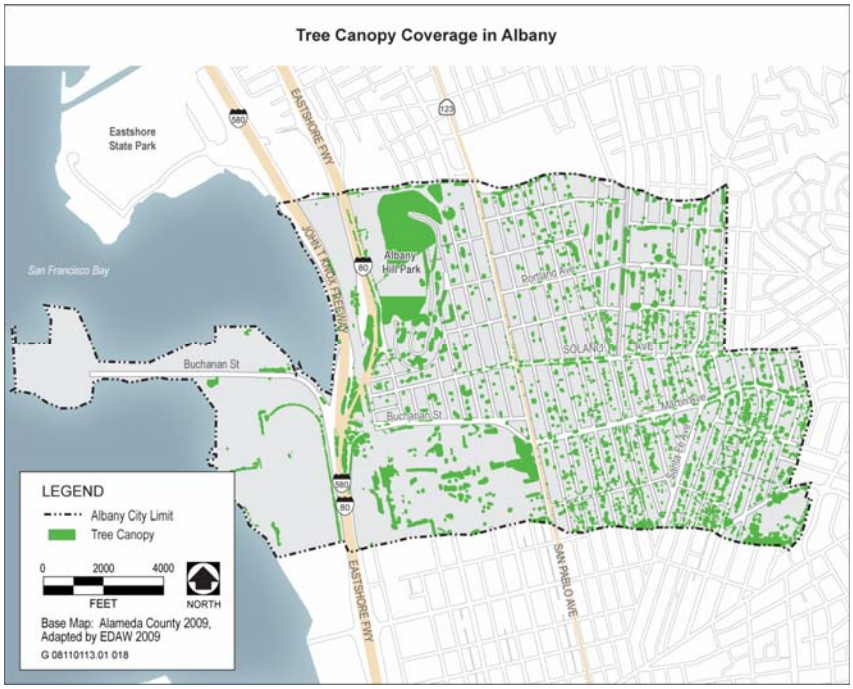
Source: Center for Urban Forest Research 2009

Tree Canopy Coverage in Albany



Urban Forest Carbon Sequestration and GHG Reductions

Trees can help the City achieve its GHG reduction target by sequestering carbon and by reducing building energy-related emissions. The capacity of a tree to reduce GHG emissions is dependent on its age and species. As trees mature, their canopies increase in size and provide higher levels of shade and greater levels of building cooling in hot weather. Additionally, trees gain carbon-capturing biomass as they grow. In Albany's coastal ocean-moderated climate, carbon sequestration can be expected to provide the majority of a tree's GHG reduction capacity. As summertime temperatures increase as a result of climate change, the building energy savings potential of the urban forest may become increasing important.

Tree species is another important factor that determines the GHG reduction capacity of Albany's urban forest. Large species achieve significantly more sequestration capacity than smaller species. Additionally, trees with larger canopies and dense foliage provide more shade than other species. Large, deciduous species are ideal for reducing building energy as they provide shade in summer, but allow winter sunlight into buildings for passive solar gain in cooler weather.

Objective GI-1:

Expand and Enhance the City's Green Infrastructure

Expanding green infrastructure in Albany will provide a wide range of benefits. The urban forest and other landscapes will sequester carbon and contribute to the achievement of the City's emissions reduction goals. The improvements will also benefit other community sustainability objectives, including stormwater management, and streetscape enhancement.

Measure GI 1.1: Enhance the community's urban forest and other landscapes to maximize carbon sequestration, reduce stormwater runoff, and augment neighborhood aesthetics.

The City will facilitate the expansion of the community's urban forest and other green infrastructure in the community. The City will Prepare a Green Albany Plan to evaluate all potential "growing areas", including parks, streets, rights- of-way, parking lots, and rooftops, for carbon sequestration. The City will seek additional funding for the Urban Forestry Program to increase both tree planting and maintenance capacity, and will seek volunteer assistance to implement the program. In order to achieve the estimated GHG reductions, 5,000 new trees should be planted between 2010 and 2020. The City will set a goal to plant 500 new trees per year during this 10-year timeframe. Additional outreach to property owners and neighborhood organizations will be an important component in achieving this target. The City will encourage planting species known to provide high levels of sequestration.

The City will also establish a Green Streets program that works to reduce and/or eliminate concrete, asphalt, and other impermeable surfaces. The program will improve tree health, reduce stormwater pollution, and enhance the aesthetics of the community's neighborhoods. The City will establish guidelines for retrofitting existing streets into green streets and will identify priority streets for pilot projects. Green street retrofits must be coordinated with sewer system repairs to avoid further infiltration and inflow into Albany's wastewater treatment system.

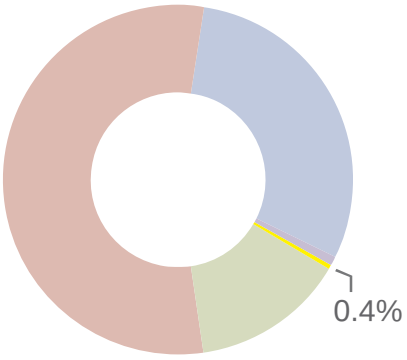
GHG Reduction Potential (MT CO_2e)	Cost to City	Cost Per Metric Ton	Private Cost
130	$21,000	$160	No

Action		Timetables	Responsibility
A	Prepare a Green Albany Plan to evaluate all potential areas (e.g. parks, streets, rights-of-way, parking lots, and rooftops) for carbon sequestration.	Before December 31, 2012	Urban Forestry Environmental Resources
B	Seek Urban Forestry Program funding to support increased tree planting and maintenance capacity.	Before July 31, 2010	City Council Urban Forestry

Measure GI 1.1:	Enhance the community's urban forest and other landscapes to maximize carbon sequestration, reduce stormwater runoff, and augment neighborhood aesthetics.		
C	Plant 500 new trees per year.	Ongoing	Urban Forestry
D	Develop outreach program to encourage residents and businesses to plant additional trees and other carbon sequestering landscapes on private property.	Before July 31, 2011	Urban Forestry Environmental Resources
E	Explore potential for undergrounding utility lines to facilitate planting of larger species of street trees.	Before December 31, 2012	Urban Forestry Public Works
F	Develop a Green Streets Program to identify priority streets for pilot green street retrofit projects.	Before July 31, 2014	Public Works Urban Forestry Environmental Resources
Progress Indicators		**Target**	
i	Number of trees planted per year.	500 trees per year	
ii	Number of total trees planted.	5,000 by 2020	

Water Conservation Strategy

Celebrate water as an essential community resource.



Total GHG Emissions Reduced:
55 Metric Tons

Objectives:

WC-1: Conserve Water in Existing Buildings and Landscapes - 18%

WC-2: Conserve Water in New Buildings and Landscapes - 82%

Water conservation measures protect the region's limited water resources, conserve energy, and reduce GHG emissions. A considerable amount of energy is used every day to pump, treat, transport, heat, and cool the water we consume. Additionally, almost all water used in homes and businesses is eventually treated as wastewater, requiring further energy inputs. The City's water conservation strategy seeks to reduce both water consumption and wastewater production in Albany's residential, commercial, and civic buildings and properties.

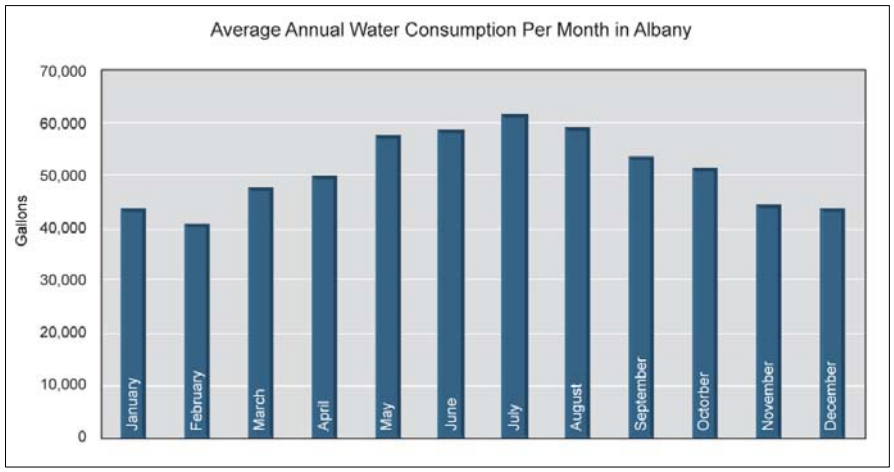
In addition to GHG emissions reductions, water conservation also allows the community to adapt to a future where climate change effects may threaten water supply. EBMUD has studied the potential effects of climate

change variables on both water supply and on the utility's extensive storage and distribution infrastructure. In general, EBMUD water supplies are most vulnerable to a potential shift in the timing of springtime runoff from the April-to-July period to winter months, and to decreases in annual runoff volumes (EBMUD 2009).
In response to potential future decreases in annual precipitation, EBMUD would likely increase water rationing in Albany. By implementing water conservation measures in this CAP, Albany may limit the extent and duration of future water rationing caused by climate change.

Background

Water Consumption

EBMUD is the City's water utility. Within EBMUD's jurisdiction, residential uses create 63% of total water demand. Commercial uses comprise 14%, and industrial and all other uses comprise 23%. While water conservation is important across all sectors, residential water demand plays the most critical role in the City's water demand management efforts.



Residential water use consists of indoor and outdoor applications. The ratio of indoor to outdoor water use is related to both housing type and the size of a residential lot. The average East Bay single-family residence uses approximately 62% of its water indoors, and 38% outdoors. Multi-family units use considerably less water per unit outdoors since multi-family yards are smaller and often shared with other tenants. Indoor water use comprises 86% and irrigation comprises 14% of multi-family water demand.

Indoor Residential Water Use

In the average Albany household, toilets use the largest amount of water, followed closely by clothes washers, showers, and faucets. Water leaks account for approximately 8% of all water use. With relatively minor upgrades to faucets, fixtures and other appliances, Albany could conserve considerable amounts of water.

Irrigation

Outdoor irrigation constitutes an important part of Albany's water demand. Water use in the City fluctuates by about 30% between wet and dry portions of the year. In late spring, soils dry up and many landscapes require watering to support plants that are poorly adapted to Albany's Mediterranean climate. If more native plant species were used in landscaping irrigated by graywater and rainwater collection systems, considerable amounts of water could be conserved.

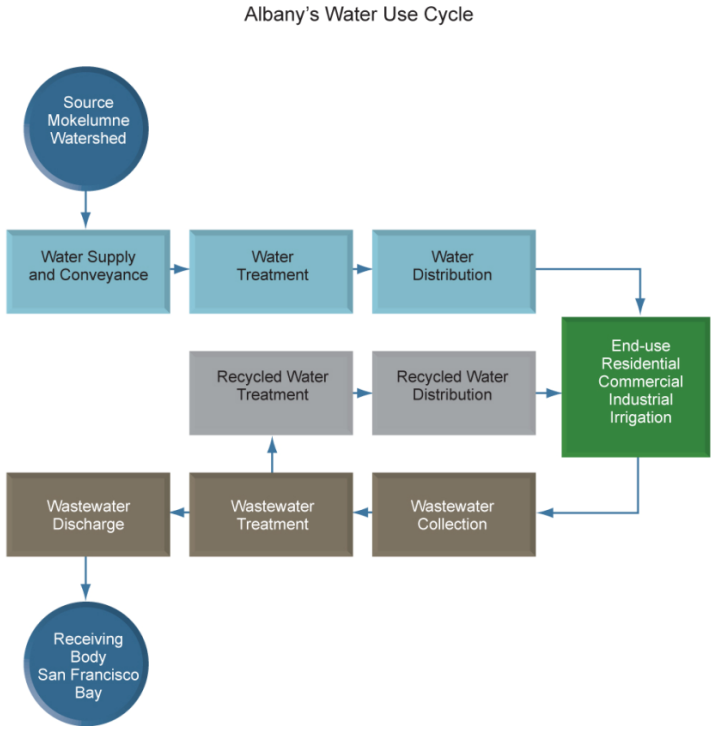
In 2006, Albany adopted an ordinance requiring use of Bay-Friendly Landscape practices on all municipal properties. The Bay-Friendly Landscape guidelines promote a wide array of techniques that conserve water and improve water quality including integrated pest management techniques, low flow irrigation systems, and the incorporation of native drought tolerant plants. The ordinance also encourages Albany residents and businesses to apply these techniques to private landscapes.

Albany's Water System and Associated GHG Emissions

For explanatory purposes, Albany's water system can be separated into three distinct components: delivery, end-use, and post-processing.

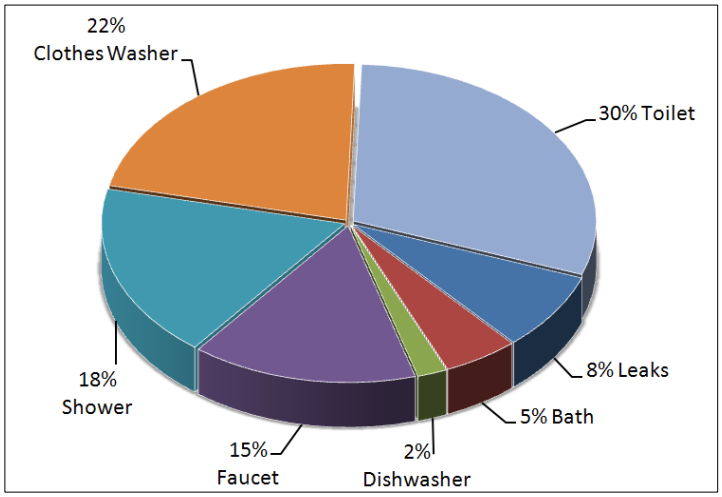
Delivery

EBMUD has one of the most energy-efficient water delivery systems in California. EBMUD receives 95% of its water from the Mokelumne River in the Sierra Nevada and water is conveyed by gravity through aqueducts to the East Bay. This gravity-driven conveyance system uses little energy. Because Mokelumne River water is of relatively high quality, it requires minimal treatment. As EBMUD's treatment facilities are located high in the East Bay hills, the elevation difference between the treatment facilities and end users pressurizes the distribution system, again requiring relatively little energy to deliver water to customers.



End-use

After water is delivered to EBMUD customers, it is used for a variety of purposes, using the majority of water-related energy. Residential uses include bathing, dish and clothes washing, toilets, and landscape irrigation. Energy is used during domestic water treatment (filtering and softening), heating (natural gas or electric water heaters), hot water circulation, and cooling (icemakers and chilled water systems for HVAC and chilled drinking water) processes. Some of the more energy-intensive applications specifically related to commercial or industrial water use includes supplemental pressurization, car and truck washing, process hot water and steam production, process chilling, equipment cooling, and cooling towers.



Post-Processing

EBMUD also provides the City's wastewater treatment, which uses the second largest amount of water-related energy. Other than water used in landscape irrigation or lost through evaporation, all water used within Albany is ultimately processed at EBMUD's wastewater treatment plant. The average wastewater facility uses about 1,050 kWh/million gallons to treat the wastewater to the point that it can be disposed of into a receiving water body such as San Francisco Bay. If wastewater is recycled for use in irrigation or industrial processes, an

additional 500 kWh to 2,000 kWh/million gallons can be required for supplementary treatment and pumping the water to its final application.

Due to this additional energy demand and the low energy intensity of EBMUD's potable water delivery system, using recycled water may result in considerably more energy demand and produce more GHGs than if potable water were used for irrigation or industrial purposes. However, using recycled water provides valuable water conservation benefits; therefore the City must balance GHG emissions reductions with water supply considerations.

EBMUD Water Rebates and Efficiency Programs

EBMUD currently offers its customers a variety of water rebates and efficiency programs. Rebate offers for residential customers include high-efficiency clothes washers, landscape irrigation systems, high-efficiency toilets, and other household water-using devices. A landscape rebate program is available to single-family residential customers that convert their irrigated lawns into more sustainable landscapes. Large non-residential water users may be eligible for commercial rebates of up to 50% of the cost of new landscape irrigation hardware. EBMUD also offers several free conservation devices to its customers, including faucet aerators and water-conserving showerheads. All EBMUD customers may take advantage of free on-site water surveys of indoor and landscape water use. Water surveys assess existing water fixtures and irrigation systems and provide recommendations for water-saving upgrades and educational materials on rebate programs.

Graywater and Rainwater Collection

Graywater and rainwater collection systems can be effective alternatives to using potable water for irrigation. Graywater systems use untreated household wastewater from bathtubs, showers, bathroom wash basins, and clothes washing machines. Using wastewater from kitchen sinks, dishwashers, or toilets is not allowed. In the East Bay, graywater makes up approximately 45% of a single-family home's wastewater output (EBMUD 2005). Incorporating graywater systems within homes and commercial buildings would eliminate this wastewater load and reduce Albany's water-related GHG emissions.

Current California law permits use of graywater systems for subsurface irrigation so long as they comply with Title 24, Part 5 of the California Plumbing Code. Further liberalization of graywater systems would be expected if SB 1258 (2009 legislative session) is approved. Though local governments retain the authority to prohibit graywater systems, the State encourages jurisdictions to permit compliant systems. To date, Albany has not approved the construction of graywater systems.

Rainwater is collected from roofs and other impermeable surfaces and stored in cisterns or barrels for use in dry weather irrigation. Rainwater can be used for either sub-surface or surface irrigation. Rainwater collection is currently practiced by some households in Albany informally using gutters connected to collection barrels. Larger rainwater collection systems use cisterns that require higher levels of design and engineering. In Albany, rainwater collection systems would result in minimal GHG emission reductions, as using rainwater in place of potable water only avoids water delivery-related energy use.

Objective WC-1:

Conserve Water in Existing Buildings /Landscapes

Water is one of Albany's most important and most constrained resources. Conserving water is an important community priority in its own right. When evaluated from the perspective of cost-per-metric ton of GHG emissions reduced, water conservation would not appear to provide the community with much benefit. The City has chosen to include these measures due to their combined water conservation and GHG reduction benefits. The City recognizes that water conservation will become increasingly important if climate change decreases available water supplies.

Most of Albany's residential and commercial buildings are more than 30 years old. Water fixtures and appliances have improved considerably since that time, and replacing antiquated equipment would result in valuable water conservation benefits. Additionally, leaking pipes and faucets account for approximately 8% of water consumption in older buildings. The following measures seek to maximize water conservation in the community's existing buildings and landscapes.

Measure WC 1.1: Encourage residential and commercial users to participate in EBMUD's free water audit program.

The City will partner with EBMUD and Stopwaste.org to provide water conservation outreach programs and will encourage residential and commercial users to participate in free water efficiency audits. This program also will encourage residents and landlords to update water fixtures and fixture fittings and repair leaks within their building water systems. The program will encourage property owners to increase water efficiency by 20% or greater.

GHG Reduction Potential (MT CO_2e)	Cost to City	Cost Per Metric Ton	Private Cost
5	$2,700	$540	Yes

Action		Timetables	Responsibility
A	Partner with PG&E and Stopwaste.org to create water efficiency programs and ensure specific focus on indoor fixture and fixture fitting retrofits.	Before December 31, 2010	City Council Environmental Resources Building
Progress Indicators		**Target**	
i	Percentage of residential units and businesses that have voluntarily implemented fixture and fixture fitting efficiency improvements since 2004.	10% by 2020	

Measure WC 1.2: Encourage 50% reduction in outdoor potable water usage for existing residential and commercial properties.

The City will create outreach and educational programs to encourage existing residential and commercial properties to reduce outdoor potable water use by 50%. Methods to be promoted by the City include: climate-appropriate landscaping, efficient irrigation systems, rainwater capture, and the use of graywater.

The use of climate-appropriate landscaping is already encouraged through the City's adopted Bay-Friendly Landscaping Ordinance. To further participation, the City will adopt an ordinance enabling property owners to construct rainwater

Measure WC 1.2:	Encourage 50% reduction in outdoor potable water usage for existing residential and commercial properties.

collection and graywater systems conforming to Title 24 Part 5 of the California Plumbing Code. The City will also provide public outreach that educates residents and businesses about the opportunities to construct graywater and rainwater collection systems on their properties. City Planning and Building staff will be trained to help interested parties understand the State code requirements for graywater systems.

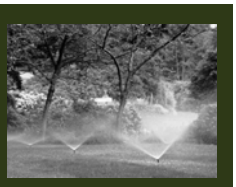
The City will also develop a program to encourage the use of weather-based evapotranspiration (ET) controller irrigation systems in private landscapes. The City will install ET controllers in all municipal landscapes. ET irrigation systems analyze soil moisture content and irrigate only when plants need water. These systems optimize irrigation efficiency and avoid over watering. Studies demonstrate that such systems can reduce residential landscape irrigation by 16% (City of Irvine, 2001).

GHG Reduction Potential (MT CO_2e)	**Cost to City**	**Cost Per Metric Ton**	**Private Cost**
5	$2,700	$540	Yes

Action		**Timetables**	**Responsibility**
A	Partner with EBMUD and Stopwaste.org to create water efficiency programs and ensure specific focus on outdoor potable water conservation practices.	Before December 31, 2010	City Council Environmental Resources Building
B	Install weather-based ET controller irrigation systems in all municipal landscapes.	Before July 31, 2015	Public Works Recreation
Progress Indicators		**Target**	
i	Percentage of residential and businesses that have voluntarily increased outdoor water conservation by 50% or more since 2004.	10% by 2020	

Objective WC-2:

Conserve Water in New Construction/Landscapes



The City's adopted Green Building Ordinance (2007) does not contain explicit water efficiency standards. Such standards will be important to ensure that water consumption and water-related GHG emissions are minimized in future construction. For this reason, the City will revise the municipal code to adopt the water efficiency standards contained in the 2008 California Green Building Code (CGBC).

Adoption of the CGBC water efficiency standards, into the City Green Building Ordinance will provide for a 20% increase in indoor water efficiency above the current California Building Standards Code, and a 50% increase in outdoor water use efficiency above the California Model Water Efficient Landscape Ordinance.

Measure WC 2.1:	Require new construction and major remodels to achieve indoor water efficiency 20% above the California Building Standards Code.

The City will amend the existing Albany Green Building Ordinance to require plumbing fixtures and fixture fittings that reduce the indoor water use by 20% as described in Section 603.2 of the 2008 California Green Building Code (CGBC). The reduction shall be based on the maximum allowable water use per plumbing fixture and fittings as required by the California Building Standards Code. Costs to Albany homeowners for these upgrades are estimated to be low.

GHG Reduction Potential (MT CO_2e)	**Cost to City**	**Cost Per Metric Ton**	**Private Cost**
25	$1,300	$50	Yes

Action		**Timetables**	**Responsibility**
A	Update Building Code to require all new construction and remodels to improve the water efficiency of fixtures and fixture fittings by 20% above the California Building Standards water efficiency standards.	Before December 31, 2010	City Council Building

Progress Indicators		**Target**
i	NA	NA

Measure WC 2.2:	Require new landscape projects to reduce outdoor potable water use by 50%.

The City will amend the existing Albany Green Building Ordinance to require new landscape projects to provide water efficient landscape irrigation design that reduces potable water use by 50% below the initial requirements for plant installation and establishment as identified in Section 604.2 of the CGBC. A new landscape project is to be defined as all landscape designs associated with new construction or any landscape project over 2,500 square feet in size.
The use of climate-appropriate landscaping is already encouraged through the City's adopted Bay-Friendly Landscaping Ordinance.

GHG Reduction Potential (MT CO_2e)	**Cost to City**	**Cost Per Metric Ton**	**Private Cost**
20	$1,300	$70	Yes

Action		**Timetables**	**Responsibility**
A	Update Building Code to require new landscape projects to reduce outdoor potable water use by 50% below the initial requirements for plant installation and establishment as identified in Section 604.2 of the CGBC.	Before December 31, 2010	City Council Building

Progress Indicators		**Target**
i	NA	NA

Food and Agriculture Strategy

Create a sustainable and climate-friendly food system.

Food and agricultural systems are responsible for a large amount of global GHG emissions. In the United States, agriculture, food processing, transportation, and distribution rely heavily on fossil fuels. Food that is grown out-of-season and transported by air results in high levels of emissions. Energy inputs increase for foods higher up the food chain and for highly processed products. Additionally, the livestock and dairy industries generate large quantities of methane gas as a natural byproduct, and other agricultural fertilizers release nitrous oxide into the atmosphere. Unconsumed, wasted food sent to the landfill also creates methane emissions.

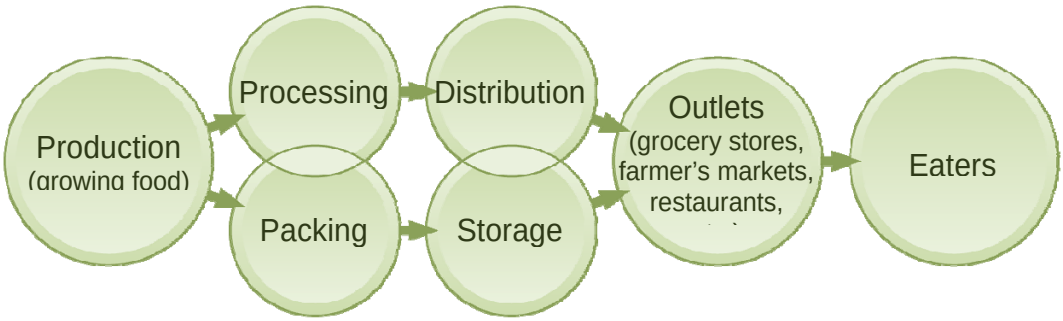
By making more informed choices about the types of food we eat, how it is produced, and where it is grown, we can reduce our GHG emissions and contribute to regional agricultural viability. While improving the ways in which we produce and consume food will reduce GHG emissions, these reductions cannot be applied to the community's reduction target as most food-related emissions occur outside of the community and were not included in the 2005 emissions inventory. While the Food and Agriculture strategy does not directly help the City achieve its reduction target, it does help residents protect the climate and improve the regional food system.

Background

Low Carbon Food Choices

The discussion regarding low carbon diets is often framed in terms of local versus non-local food sources. While the transportation of non-local foods does contribute to higher GHG emissions, it is not the most important factor when addressing our food carbon footprints. The amount and types of foods we eat has a more significant effect on the GHG emissions associated with our diets. Small lifestyle adjustments such as eating according to the seasons, choosing foods that are lower on the food chain, and choosing foods that are minimally processed can make a big difference.

Eating according to the seasons reduces the amount of food-related transportation emissions. Transporting out-of-season perishable foods, such as blueberries and tomatoes, can generate more GHGs than seasonal locally sourced foods. Air transportation is the highest-emission method of transporting food. Growing hothouse tomatoes and other produce in the winter is also extremely emissions-intensive because of the energy required to support plant development.



Eating from lower on the food chain is more efficient, in terms of energy input required per calories produced, compared to foods higher on the chain. Fruits, vegetables, and grains grown in North America are low carbon options for Albany residents. Poultry is relatively low in carbon compared to beef, which produces large quantities of methane during its lifespan and requires high energy inputs to grow its feed. Similarly, dairy products are also high in carbon because cows, sheep, and goats all naturally emit methane. To reduce food-related GHG emissions, meat eaters can eat smaller portions of meat, vegetarians can eat fewer dairy products, and everyone can limit the amount of food that they send to landfills.

Eating minimally processed or unprocessed foods also limits the energy input per meal. Processing and packaging foods is energy-intensive, and most processed foods contain ingredients that are highly processed themselves, such as high fructose corn syrup, sugar, or salt. Other processed foods require additional energy inputs during transportation, such as is the case with the refrigeration required to transport orange juice.

Community Food Production

The City recognizes the importance of community food security and providing residents with the ability to grow or purchase fresh produce. Urban agriculture is increasingly popular in communities throughout the nation. Home gardens, community gardens, urban orchards and farms, and edible landscaping offer city dwellers opportunities to participate in local food production. Farmer's markets provide urban consumers with locally-grown produce and a means to support the region's farmers and ranchers.

Albany currently has three community gardens located at Ocean View Park, Albany High School, and adjacent to University Village. Ocean View Park has 14 raised-bed garden plots, which are available to the public on a lottery system. The High School garden is a small facility reserved for student use. The University Village garden is a two-acre facility with numerous garden plots; however garden plots are only available to Village residents.

Strong demand exists for additional community garden space in Albany. Currently, there is no regularly scheduled farmers' market in Albany. The closest farmers' market is located at Shattuck Avenue and Rose Street in Berkeley on Thursday evenings year-round.

Food and Agriculture Objectives and Measures

Objective FA-1:

Strengthen the Regional Food System

Albany is located near the productive farmlands of the Central Valley, Solano County, and other important agricultural areas. This proximity provides residents with direct access to seasonal harvests and regionally-produced dairy products, meats, and eggs. The following measures help the City to reduce GHG emissions and support the regional agricultural economy by strengthening ties between farmers and consumers and celebrating the region's agricultural diversity.

Measure FA 1.1:	Establish a permanent farmer's market site within the City and work to expand the market as a community resource.

The City will explore potential sites for a farmer's market. Ideal sites would be centrally located and adjacent to pedestrian and bicycle infrastructure. The benefits of an open air versus covered market structure will be evaluated as part of the site analysis.

GHG Reduction Potential (MT CO_2e)	Cost to City	Cost Per Metric Ton	Private Cost
Not included in inventory	$20,000	-	No

Measure FA 1.2	Facilitate and promote Community-Supported Agriculture organizations and services.

Participating in Community Supported Agriculture organizations (CSAs) allows residents to support agriculture in the regional economy and contributes to a low carbon diet by providing seasonal foods with minimal processing and packaging. The City will maintain a list of regional CSAs on its webpage with links and contact information to help interested residents to get involved.

GHG Reduction Potential (MT CO_2e)	Cost to City	Cost Per Metric Ton	Private Cost
Not included in inventory	$2,700	-	No

Measure FA 1.3	Procure regionally produced food for City events and encourage vendors at City sponsored events to procure food regionally.

The City will attempt to serve food produced within 150 miles at all City-sponsored events and will encourage vendors at public events to do the same. The City will amend relevant procurement policies to ensure implementation of this measure.

GHG Reduction Potential (MT CO_2e)	Cost to City	Cost Per Metric Ton	Private Cost
Not included in inventory	$2,700	-	No

Objective FA-2:

Promote Awareness of Sustainable Food Choices

The types of food we eat are an important factor when considering one's personal GHG emissions. Diets that use seasonal produce and consume less meat and dairy products and fewer processed foods have a lower carbon footprint. The City will facilitate outreach events that educate residents and create informed food purchasing decisions.

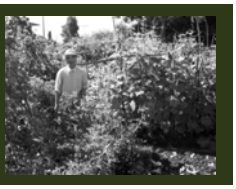
Measure FA 2.1	Encourage low-carbon meals through public education.

The City will partner with community organizations and businesses to provide outreach regarding low-carbon diets. The City will facilitate outreach events that focus on low-carbon strategies such as eating seasonal and minimally processed foods.

GHG Reduction Potential (MT CO_2e)	Cost to City	Cost Per Metric Ton	Private Cost
Not included in inventory	$2,700	-	No

Objective FA-3:

Increase and Enhance Urban Agriculture



Many Albany residents support urban agriculture as a means of both food production and recreation. To provide adequate opportunities, the City needs to expand current urban agricultural facilities. The following measures describe steps to create additional community gardens and orchards in Albany, and opportunities to establish a community orchard.

Measure FA 3.1	Establish a local community garden program to increase local food security and provide local recreation amenities.

During the preparation of the Green Albany Plan, the City will identify potential sites for additional community gardens and community orchards within Albany. Site evaluation will focus on lands owned by the City, School District, and State and federal agencies and institutions. The City will work with willing agencies, community groups, and individuals to develop and maintain community gardens.

The Ohlone Greenway is a prime location to establish a community orchard. The City will work with BART to establish compatible fruit trees along the Greenway and will create outreach programs and events to facilitate the public use of this resource. The Green Albany Plan will evaluate other locations for potential community orchards.

GHG Reduction Potential (MT CO_2e)	Cost to City	Cost Per Metric Ton	Private Cost
Not included in inventory	$1,400	-	No

Community Challenge

The State's *Climate Change Scoping Plan* recommends that local governments reduce their community-wide GHG emissions to 15% below current levels by 2020. In 2007, Albany adopted a resolution to reduce GHG emissions by 25% below 2004 levels by 2020. To achieve this target the community would have to reduce its emissions by 19,600 MT CO_2e. The measures described above are likely to achieve approximately 15,660 MT CO_2e of reductions or a reduction of 19% below 2005 levels by 2020. While the strategies achieve the State's recommended target they do not fully achieve the City's more aggressive target. A gap of 3,940 MT CO_2e remains and will need to be addressed if Albany is going to achieve its climate protection objectives. The Community Challenge is a call to action that seeks to inspire Albany residents, businesses, employees, and City staff.

Community Participation

Specific participation levels were used to calculate the GHG reduction capacity of the CAP measures. High levels of voluntary particiption will be key to achieving the City's 2020 target. If additional households and businesses voluntarily participate, then the community's reductions could be larger than estimated in the CAP.

While increased participation in all measures is needed, certain actions will have larger influence than others. Increasing the number of homes and businesses that conduct building energy efficiency improvements and or install renewable energy systems could alone close the remaining reduction gap. Similarly, increasing resident and employee participation in Transportation Demand Management (TDM) programs could reduce a considerable amount of transportation-related emissions.

As an example of how higher participation could affect GHG reductions, Table III-10 describes the reduction potential of residential renewable energy,and residential and non-residential implementation using both assumed participation rates and increased levels of participation. If community participation could be increased to these higher levels, the remaining gap could be eliminated. Many other opportunities to increase community participation also exist within the CAP.

Table III-10.
Effect of Increased
Participation on GHG Emissions Reductions

Action Type:	Assumed Participation Rate	GHG Reduction Potential (MT CO_2e/year)	Increased Participation Rate	GHG Reduction Potential (MT CO_2e/year)
Residential Renewable Energy (as contained in Measure BE-2.1)	20%	2,730	45%	6,150
Residential Energy Efficiency Retrofit (as contained in Measure BE-2.1 and 2.3)	47% BE-2.1 & 2.3 Combined	1,150	70% BE-2.1 & 2.3 Combined	1,700
Non-Residential Energy Efficiency Retrofit (as contained in Measure BE-2.1 and 2.3)	21% BE-3.1 & 3.2 Combined	360	70% BE-2.1 & 2.3 Combined	880
Total:	-	**4,240**	-	**8,730**

In order to mobilize higher levels of participation in all GHG reduction activities, the City and community organizations will need to conduct unprecedented levels of public outreach. These outreach programs must inspire individuals to become involved. In addition to outreach, financial assistance programs must grow to meet the increased interest in programs such as building retrofit and renewable energy installation.

Individual Actions

Ultimately, the community's GHG emissions are the sum of individual actions and choices. By changing our behavior and consumption patterns, individuals, households, and businesses have the ability to reduce their GHG emissions. Combined, these individual actions do add up. Many individual actions are beyond the scope of municipal policies and will be carried out on a voluntary basis. While this is true, the City will assist individual actions through outreach programs and technical assistance.

The City will maintain a climate action portal on the City's website and will provide a household carbon calculator, a list of recommended actions and resources, and links to community and national climate action groups. The list of recommended actions will be frequently updated and provide useful, easy-to-implement GHG reduction tips.

A list of potential individual actions that residents could implement includes the following:

- **Home Energy and Water Conservation:**
  - Buy energy-efficient appliances with the "Energy Star" label
  - Reduce the thermostat in cool weather by three degrees
  - Weather-proof your building
  - Unplug electronics when not in use and use energy reducing surge protectors
  - Install motion sensors on outdoor lights and in infrequently used rooms
  - Turn off lights and other devices when not needed
  - Replace older light bulbs with energy-saving fluorescent or LED bulbs

- Maintain your refrigerator and freezer at the right temperature
- Replace all fixtures and fixture fittings with the most water efficient option
- Take shorter showers or use less bath water
- Don't leave the tap running when not brushing teeth, shaving, or doing dishes
- Turn down the water heater temperature
- Use appliances efficiently – only run the dishwasher or clothes washer when it is full
- Dry your clothes on a clothes line
- Convert your lawn into a garden or native plant landscape
- Use drought resistant plant species

- **Shopping:**
  - Buy fewer items
  - Buy second-hand items if possible
  - Buy durable goods
  - Buy only post-consumer recycled paper products
  - Buy FSC certified wood to support sustainably managed forests
- **Transportation:**
  - Bike to work or shopping
  - Use public transit or carpools for long trips
  - Walk short distances rather than drive
  - Drive more efficiently
  - Consolidate trips
  - Purchase an efficient model next time you need to buy a car
  - Consider doing without your car
- **Diet:**
  - Eat low on the food chain (reduce meat and dairy in your diet)
  - Eat local seasonal produce
  - Eat minimally processed foods

Additional Emission Reductions from Statewide Legislation

To implement AB 32, the State of California has established companion legislation that will reduce GHG emissions statewide, across all sectors. SB 107 and AB 1493, described within Chapter III, establish performance standards for GHG emission reductions from electric utilities and motor vehicles, respectively. As the regulatory framework surrounding AB 32 grows, other future legislation will help further reduce GHG emissions statewide. At the time of CAP preparation, the City only has confidence in estimating the GHG emission reductions associated with SB 107 and AB 1493. In the future when additional legislation is further defined it will possible evaluate a wider range of statewide reductions. Please also refer to Chapter I for further discussion of State Climate Change regulations.

Senate Bill 107

SB 1078 and SB 107 have established increasingly stringent renewable energy requirements for California utilities. SB 1078 required investor-owned utilities to provide at least 20% of their electricity from renewable resources by 2020. SB 107 accelerated the timeframe to take effect in 2010. Renewable energy could include

wind, solar, geothermal, or any "Renewable Portfolio Standard (RPS)-eligible" sources. It is anticipated that PG&E, Albany's electricity provider, would meet the 20% RPS requirement by 2010, as required by law, and this performance criteria would also be in effect at the CAP target year (2020). Therefore, in the year 2020, a minimum of 20% of the electricity consumed by the City's residential, commercial, and industrial uses would be produced by renewable resources and would not generate additional GHG emissions. Executive Order S-14-08 would increase the RPS further to 33% by 2020, but this order has yet to be codified at the time of preparation of this report. Thus, only the 20% RPS can be considered foreseeable at the time of writing.

The 2005 PG&E-specific electricity emission factor used to calculate GHG emissions associated with the City's electricity consumption accounted for the percentage of renewable resources used by PG&E for electricity production in 2005. PG&E's current (2008) electricity production portfolio is comprised of approximately 14% renewable resources (PG&E 2008). Although it is likely that the percentage of renewable resources in 2005 was less than in 2008, the difference between the 2008 and 2020 renewable resource portfolio was used to conservatively calculate the emission reduction attributable to SB 107.Therefore, an additional 6% of the City's 2020 GHG emissions associated with electricity consumption would be reduced between current conditions and 2020 associated with the implementation of SB 107. See Table III-10 below for the estimated emissions reduction effect of SB 107 on Albany's 2020 GHG emissions.

Assembly Bill 1493

AB 1493 will result in GHG emission reductions from on-road passenger motor vehicles sold in California. The emission reduction potential associated with implementation of AB 1493 vehicle emission standards would vary depending on the first regulated model year and vehicle turnover between the present fleet and the fleet in 2020.

Emission factors used (EMFAC 2007 and CCAR's *General Reporting Protocol* Version 3.1) to estimate 2020 and 2050 transportation-related GHG emissions do not account for mobile-source GHG emissions reductions that could be achieved through implementation of AB 1493 or equivalent regulations because the law has not been fully implemented at the time of writing.

To provide an estimate of the reasonably foreseeable GHG emission reduction potential of motor vehicle emission regulations, the GHG emissions reduction associated with AB 1493 was estimated using information presented in the AB 32 Scoping Plan. The *Climate Change Scoping Plan* expects approximately a 19.7% reduction in on-road mobile-source GHG emissions (ARB 2008). AB 1493 allows two model years of lead time for automakers to comply with the vehicle emission standards. Therefore, the earliest model year that could reasonably be expected to comply with AB 1493 would be model year 2012. For this reason, it was assumed that AB 1493 would be 80% implemented by the year 2020 (allowing for two years of delay). Thus, the likely GHG emission reduction of AB 1493 on on-road mobile-source GHG emissions in Albany was assumed to be approximately 15.76%. See Table III-10 below for estimated GHG emission reduction potential of AB 1493 in the City of Albany.

Table III-11.
Greenhouse Gas Emission Reductions from State Legislation

Legislation	GHG Emission Reductions from Projected 2020 Emissions (MT CO_2e)
SB 107	968
AB 1493	3,629
See Appendix A for detailed assumptions and calculations.	

Statewide Reductions in Relation to CAP Measures

The emission reductions shown above in Table III-10 represent the upper bound of the potential emission reductions associated with SB 107 and AB 1493. Similar to the method used to quantify the City's CAP measures, the statewide emission reductions estimates assume that no other emission reduction activities would occur. In reality, implementation of the City's CAP measures and the State regulations could occur, simultaneously or one preceding another. Thus, GHG reductions from emissions sectors affected by both City CAP measures and State regulations would not have a purely additive effect. Rather, emission reductions achieved by one (i.e., CAP measures or State regulations) would reduce the capacity of the other to reduce emissions. For example, if SB 107 reduces electricity consumption-related emissions by 6% then the potential for additional GHG reduction by the City's electricity conservation-related CAP measures would be reduced. Conversely, if the City's CAP measures reduce the quantity of electricity consumption-related GHG emissions, then the overall effectiveness of SB 107 is reduced.

The timing and synergistic effect of the State regulations in relation to the City's CAP measures are uncertain. Nonetheless, because the focus of the CAP is on actions the City can take to reduce community-wide GHG emissions, the emission reductions achieved by the City's actions were determined first and independent of statewide reductions. As discussed earlier in this chapter, Albany has made efforts to ensure that reductions contained within the CAP provide a unique and independent contribution to the State's GHG gas reduction efforts. The City has not taken credit for any of the reductions resulting from the implementation of the State regulations. The emission reductions associated with SB 107 and AB 1493 are likely to further reduce GHG emissions within the community.

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