

CHAPTER 13 SUSTAINABILITY

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13.2 PURPOSE OF CHAPTER

The purpose of this chapter is to document baseline sustainability issues and existing conditions in the City of Mountain View. Sustainability is defined as the ability to meet current needs without compromising the ability of future generations to meet their own needs.¹ The concept of sustainability can encompass a wide range of topics related to the environment, the economy and social equity (often referred to as “the triple bottom line” of sustainability).

This chapter focuses primarily on environmental sustainability, though environmental sustainability often has economic and social co-benefits. Environmental sustainability is a cross-cutting issue relevant to many General Plan policy areas such as health, land use, transportation, and public facilities. These are referenced throughout this chapter when appropriate.

Each section of this chapter, prepared by Raimi & Associates and MIG, contains a description of past accomplishments and actions currently underway. It also summarizes key “sustainability indicators” that reflect the City’s current performance in different areas. The indicators can suggest potential policies, serve as the basis for sustainability performance targets or be used over time to evaluate the effect of sustainability efforts.

¹ This definition of sustainability was developed by the United Nations Bruntland Commission in 1983, and is commonly used by cities and countries around the world.

13.3 DRAFT HIGHLIGHTS AND OBSERVATIONS

These represent key observations, issues and highlights noted by City staff and the consultant team related to Sustainability.

- Several energy conservation and renewable energy use efforts have been successfully implemented for municipal operations. Additional efforts by residents, businesses and the City to achieve community-wide energy sustainability, including efficiency, conservation and renewable energy production in private buildings and vehicles should continue to expand.
- Commercial buildings in Mountain View (including retail, office and R&D) use much more energy than residential and industrial buildings. There may therefore be opportunities for energy savings in the commercial sector, particularly through working with large individual energy users, although this must be determined by focused analysis. Opportunities for reductions in industrial and residential buildings are also likely to exist.
- Mountain View has a variety of public transit options, including two Caltrain stations, five VTA light rail stations and several VTA bus lines. Rates of bicycling to work are higher than the national, state, and county average. Rates of single-occupant automobile commuting, on the other hand, are also higher than the national, state, and county average, while carpooling rates are much lower. Rates of walking to work are lower than the national and state average but higher than the county average.
- The City has adopted a policy requiring all new and significantly retrofitted City facilities greater than 5,000 square feet to be U.S. Green Building Council LEED Silver certified. To continue these efforts towards green building, the City should explore green building standards for new and existing private buildings.
- Key issues for the City to address related to urban ecology include preservation and enhancement of natural areas and water bodies, tree planting, integrated pest management and innovative storm water treatment.
- Mountain View diverted 72 percent of its waste from landfills in 2006, a significant increase from the 37 percent diversion rate in 1995. It is among the highest diversion rates of any city in the country.
- There are currently 41 registered green businesses in Mountain View. Additional outreach can be used to expand the number of green businesses in the City.
- The Mountain View City Hall and Senior Center are certified green businesses. The City is also currently preparing a handbook to guide staff in enacting its Environmentally Preferable Purchasing Policy, and the City's "Green Team" has developed various strategies for improving the sustainability of City operations.

- The City is in the process of preparing a municipal greenhouse gas emissions inventory and has completed a community inventory. The City has signed the U.S. Mayor’s Climate Protection Agreement and plans to set emissions reductions targets and prepare a *Greenhouse Gas Reduction Program*.
- The City Council adopted an *Environmental Sustainability Action Plan*, which prioritizes 25 actions to be implemented by the City over the next few years.
- Sustainability issues and concepts, including addressing climate change, should continue to inform the development of all General Plan policies.

13.4 MOUNTAIN VIEW AND SUSTAINABILITY

The General Plan Update is occurring within the context of sustainability policies, programs and efforts already initiated within the City of Mountain View. A task of the General Plan Update will be to reflect these existing efforts and provide a context for how they will continue or develop over the next 20 years. Below is an overview of recent and current sustainability policy-making and implementation in the City, and an overview of how this integrates with the General Plan Update.

Mountain View Sustainability Program

On August 27, 2007, the Mountain View City Council allocated \$173,000 to initiate the Environmental Sustainability Program. This created a fund for implementation of sustainability projects, and funded a full-time Sustainability Coordinator for one year. It was supplemented in the subsequent Fiscal Year with additional funds for the Environmental Sustainability Program, including continuation of funding for the Sustainability Coordinator staff position. Initiation of the Environmental Sustainability Program was the precursor to the efforts described below, including the creation of the Environmental Sustainability Task Force and the Council Environmental Sustainability Committee; adoption of the Environmental Sustainability Action Plan; and inclusion of sustainability as an important component of the General Plan Update, including the creation of a Greenhouse Gas Reduction Program.

Environmental Sustainability Task Force

In January 2008, the Mountain View City Council created an Environmental Sustainability Task Force (ESTF), and in October 2008 it accepted the ESTF's Final Report. The ESTF was tasked with creating recommendations for making Mountain View more environmentally sustainable, including reducing greenhouse gas emissions. It was comprised of more than 65 volunteers, including local business representatives, technical experts, residents and City staff. There were 11 ESTF working groups, each of which produced detailed recommendations in the ESTF's Final Report, in the following areas of sustainability:

- Baseline and Measurements;
- Adaptation to Climate Change;
- Water Availability and Use;
- Waste, Waste Reduction and Recycling;
- Energy and Renewable Energy;
- Transit and Transportation;
- Land Use Planning;
- Built Environment;
- Suburban Natural Ecosystems and Biodiversity;
- Sustainable Quality of Life; and
- Community Outreach and Green Business.

In all, the 11 topics in the ESTF Final Report included a total of 89 policy recommendations to City Council.² Since the ESTF Final Report was prepared by a

² The ESTF Final Report is available on the Environmental Sustainability portion of the City's website at http://www.ci.mtnview.ca.us/services/learn_about_our_city/environmental_sustainability_task_force.asp.

diverse group of citizens, staff members and professionals offering pro bono help, the topics have varying levels of detail, scenario development and City-specific data. Recommendations in the ESTF Final Report did not undergo a thorough staff and council evaluation. However, there is a variety of information and research in the ESTF Final Report that can contribute directly to this survey of current conditions for the General Plan. Following the disbanding of the Environmental Sustainability Task Force, many of the citizens who were involved formed a new group called Green Mountain View. Green Mountain View has continued pursuing sustainability efforts and was recently awarded a grant from the City of Mountain View.

Council Environmental Sustainability Committee and Environmental Sustainability Action Plan

Upon receipt of the ESTF Final Report, the City Council appointed three council members to the Council Environmental Sustainability Committee which was tasked with evaluating the 89 recommendations and prioritizing which recommendations to include in a draft *Environmental Sustainability Action Plan*. With the input of quantitative environmental and financial cost-benefit analysis completed by City staff, the Council Environmental Sustainability Committee identified 25 of the ESTF's original 89 proposed actions as feasible priorities to be completed over the next three fiscal years. These 25 priority actions are included in the committee's *Environmental Sustainability Action Plan*, which received full Council approval in March 2009. Table 13-1 summarizes the priority actions in the *Environmental Sustainability Action Plan*, where they are addressed in the Current Conditions Report, and the implementation status of each. The Environmental Sustainability Committee is an ongoing group and effort within the City.

General Plan Integration

The General Plan should provide a visionary framework and policy support for the many ongoing sustainability efforts in the City. Important topics for the General Plan to address include both greenhouse gas reduction efforts and wider sustainability goals such as sustainable water use, pollution reduction, enhanced indoor and outdoor air quality, and sustainable consumption and production of other natural resources. A separate Greenhouse Gas Reduction Program will be completed in conjunction with the General Plan update process.

Table 13-1 Environmental Sustainability Action Plan Summary and Status

Action	Lead Department	Current Conditions Report Section Where Addressed	Estimated Completion Date
<i>Fiscal Year 2008-2009</i>			
1. Adopt CO2 Emissions Goals	PWD	Section 13.11 (Climate Change Adaptation and Mitigation: Greenhouse Gas Emissions Inventories), p. 401	Fall 2009
2. Redesign Water Billing Format	FASD	Section 9.6 (Water Availability and Use: Water Use), p. 291	Winter 2009
3. Recruit and Train Water Conservation Advocates	PWD	Section 9.6 (Water Availability and Use: Water Use), p. 291	Fall 2009
4. Participate in the Single-Use Bag Ordinance	PWD	Section 13.5 (Waste, Waste Reduction and Recycling: Efforts Planned and Underway), p. 384	November 2009
5. Install Labeling on Trash	PWD	Not discussed in Current Conditions	September 2009

Containers in Public Areas		Report	
6. Establish LEED Silver as the Standard for New City Facilities	PWD	Section 13.7 (Green Building Program), p. 390	Completed: LEED Silver requirement for new or retrofitted 5,000+ sf city facilities, adopted by council May 24, 2009
7. Support a Community-Led Green Citizens Action Team	PWD	Not discussed in Current Conditions Report	Ongoing
8. Sponsor Sustainability Tabling and Outreach at Local Events	PWD	Not discussed in Current Conditions Report	Ongoing
9. Work with VTA to Redesign Community Bus Route 34	PWD	Section 13.8 (Transportation and Land Use: Transit Facilities), p. 393	January – VTA to implement routing changes throughout the system
10. Incorporate Climate Change Elements into General Plan Update	CDD	Section 13.4 (Mountain View and Sustainability: General Plan Integration), p. 381	December 2010
Fiscal Year 2009-2010			
1. Continue the Environmental Sustainability Coordinator Position for One Year	PWD	Not discussed in Current Conditions Report	Completed
2. Secure Technical Assistance to Establish an AB 811 Benefit Assessment	PWD	Section 13.6 (Energy Consumption and Production: Municipal Energy Production), 387	Ongoing investigation, with availability of regional programs to be determined at a later date
3. Evaluate Feasibility of Implementing a Municipal Renewable Energy Facility (AB 2466)	PWD	Section 13.6 (Energy Consumption and Production: Municipal Renewable Energy Production), p. 387	TBD
4. Create a Zero-Waste Action Plan	PWD	Section 13.5 (Waste, Waste Reduction and Recycling: Efforts Planned and Underway), p. 384	Waste Characterization: November 2009. Action Plan: October 2010. Phase II Pilot: October 2009.
5. Fully Implement Bicycle Boulevards	PWD	Section 13.8 (Transportation and Land Use: Bicycle Network), p. 393	Fall 2010
6. Participate in a Regional Effort to Study Feasibility of Automated Bicycle Rentals	PWD	Section 13.8 (Transportation and Land Use: Bicycle Network), p. 393	TBD
7. Prepare, Adopt and Implement a Pedestrian Master Plan	PWD	Section 13.8 (Transportation and Land Use: Pedestrian Facilities), p. 394	Late 2010/Early 2011
8. Increase Free Arbor Day Trees	CSD	Section 13.9 (Urban Ecology: Parks and Greenscape), p. 396	March 2010
9. Create Environmental Displays at the Library	Library	Not discussed in Current Conditions Report	December 2009
10. Implement State-Mandated Landscape Water Conservation Program	PWD	Section 9.6 (Water Availability and Use: Water Use), p. 290	TBD
11. Retrofit City Facilities with Green Technologies/Green the Library	PWD	Section 13.7 (Green Building Program), p. 390	Will be determined once improvements are identified.
12. Enhance Expertise of CDD and PWD Staff Members in Green Building Practices	CDD	Section 13.7 (Green Building Program), p. 390	Summer 2010
13. Establish Green Building Standards for Private Buildings	CDD	Section 13.7 (Green Building Program), p. 390	Summer 2010
Fiscal Year 2010-2011 and Beyond			
Participate in Regional Efforts to Ban Polystyrene Take-Out Food Containers	PWD	Section 13.5 (Waste, Waste Reduction and Recycling: Efforts Planned and Underway), p. 384	
Retrofit City Facilities with Green Technologies/Building TBD	PWD	Section 13.7 (Green Building Program), p. 390	

13.5 WASTE, WASTE REDUCTION AND RECYCLING

Discarded waste uses up finite landfill space and often releases toxic material or produces toxic concentrations of material. Waste also creates greenhouse gas emissions and contributes to climate change, either by causing organic waste to decompose anaerobically (without access to oxygen) and produce methane – which has approximately 23 times greater greenhouse gas effect than CO₂ – or by failing to re-use the “embedded” energy in cans, bottles, plastics, metals and other items that could be recycled.³ Although avoided landfill methane is reflected in Mountain View’s current greenhouse gas inventory while “embedded” energy from recycling is not, both can continue to play an important role in the City’s greenhouse gas reduction efforts. Reduction in the amount of overall waste generated in the first place is also an important strategy. Waste reduction and recycling is also a proven tool for raising awareness and changing behavior related to other elements of environmental sustainability.

Waste Diversion and Reduction Program

Mountain View diverts 72 percent of its solid waste from landfills, which is a notable success and among the highest diversion rates in the country. In a fall 2007 study of the U.S.’s 50 most populous cities, only seven cities – San Francisco, Long Beach, New York City, San Jose, Los Angeles, Fresno, and Portland – had waste diversion rates above 60 percent, and the highest (San Francisco) was 69 percent.⁴

Around 18 percent of Mountain View waste disposed in 2007 was household waste, while 82 percent was business waste.⁵ Mountain View’s diversion rate has increased dramatically over the past ten years as a result of an aggressive recycling and reuse program, which includes the following:

- Free residential and commercial recycling and yard trimming pickup;
- Additional recovery of recyclables from garbage at the SMaRT Station, a materials recovery and refuse transfer facility shared by Mountain View, Palo Alto and Sunnyvale;
- Participation in the County-run backyard composting, public education, Green Business and hazardous waste programs;
- Reuse and educational programs such as an annual community garage/yard sale and the replacement of free spring and fall cleanup days with an “On-Call” program; and
- A strong business recycling outreach and assistance program, which includes a commercial food waste composting pilot program (up to 15 tons/day).

Recent legislation has shifted the historical emphasis on using the measure of estimated diversion to using the measure of annual disposal to evaluate a jurisdiction’s compliance with AB 939, the State law that requires a minimum of 50 percent of waste to be diverted from landfill. Mountain View, along with all other jurisdictions, will now measure and report a per capita disposal rate as an indicator of how well its waste

³ Embedded energy and resources are those involved in the creation of a product: extraction of materials, transportation, emissions from factories, and other distribution and business infrastructure.

⁴ SustainLane 2008 US City Rankings, available at <http://www.sustainlane.com/us-city-rankings>.

⁵ California Integrated Waste Management Board, City of Mountain View Jurisdiction Profile, available at www.ciwmb.ca.gov.

reduction and diversion programs are performing. Under the new system, Mountain View must report a per capita disposal rate that is at or below a 50 percent equivalent target. Mountain View's annual per capita disposal target is 7.8 pounds per day. The actual annual per capita disposal rate reported for 2007 is 4.4 pounds per day and thus well under the target, as noted in Table 13-3.

Table 13-2 Mountain View Historical Waste Diversion Rates⁶

	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006
Mountain View	37 %	43 %	43 %	45 %	47 %	52 %	50 %	51 %	n.a. ⁷	73%	74 %	72 %

Efforts Planned and Underway

Several waste reduction efforts are not yet reflected in Mountain View's diversion and disposal rates shown above, but will likely continue to reduce waste and decrease landfill disposal rates in the future. The draft *Environmental Sustainability Action Plan* proposes creating a Zero-Waste Action Plan, including a waste characterization study, during Fiscal Year 2009-2010. A Zero-Waste Plan would provide detailed implementation guidance for waste reduction efforts in the City, and strive towards reducing or eliminating waste and toxics from various sectors.

Waste Production

If a city's production of waste (pre-diversion) is increasing more rapidly than its diversion rate, then the total tonnage of waste being landfilled can continue to increase. Two examples of ongoing efforts in the City to reduce waste are related to single-use products. First, the City is working with the Santa Clara County Recycling and Waste Reduction Commission on a regional initiative to develop a model ordinance requiring merchants to charge customers for single-use paper or plastic carry-out bags. This effort was supported by a January 27, 2009 City Council Resolution and is included as a FY 2008-2009 action in the *Environmental Sustainability Action Plan*. Second, the *Environmental Sustainability Action Plan* proposes participating in another regional effort to ban polystyrene take-out food containers, in FY 2010-2011. These efforts could be bolstered by continued education and other programs to reduce total waste production in the City.

Construction Waste

In August 2008, the City Council adopted a Construction and Demolition Ordinance requiring demolition and construction projects greater than 5,000 square feet to divert a minimum of 50 percent of debris from the landfill. Currently, construction and demolition debris is estimated to comprise between nine and 13 percent of Mountain View's waste.⁸ The ordinance became effective on January 1, 2009.

Recycled-content Asphalt and Concrete

The City has been investigating the use of Rubberized Asphalt Concrete (RAC), which is composed partly of recycled tires, for many years. RAC also significantly reduces road noise. Through a grant from the California Integrated Waste Management Board, the City will use RAC on several residential streets in 2009, and RAC will become a City

⁶ Ibid.

⁷ Not calculated by CIWMB due to ongoing review of new "base year" application period.

⁸ Estimate by Steve Attinger, City of Mountain View Sustainability Coordinator, 2009.

standard when its price becomes competitive. The City also reuses most old asphalt in Recycled Aggregate Products (RAP), and uses a concrete mix containing two to three percent fly ash.

Table 13-3 Key Indicator Data for Waste, Waste Reduction and Recycling⁹

	Measure
Annual per capita waste disposal rate, pounds per day	4.4 pounds

⁹ Data provided by the City of Mountain View, courtesy of Martin Alkire, Community Development, April 2009.

13.6 ENERGY PRODUCTION AND CONSUMPTION¹⁰

A sustainable energy economy is one of the global and local challenges of the 21st century. Energy produced from non-renewable fossil fuel sources is a finite resource with increasingly recognized negative environmental impacts. One impact is climate change, which has been linked to greenhouse gas emissions. Energy use (in buildings, transportation, or elsewhere), is a primary source of greenhouse gases.

The two basic strategies for achieving energy sustainability involve production – characterized by an increasing share of energy from renewable sources – and consumption – characterized by increased energy conservation and efficiency, as well as other systemic and behavioral changes to minimize energy demand. Reducing energy consumption through efficiency, conservation and behavioral change is less expensive and easier to achieve than developing new renewable energy sources.

Municipal Conservation and Efficiency

To date, City efforts at energy conservation and efficiency have focused primarily on municipally-controlled infrastructure, including City vehicles, buildings, streetlights and other infrastructure.

Municipal Vehicles

Mountain View's Fleet Services Section, through its vehicle replacement program, has taken several steps to replace aging municipal vehicles with vehicles that use less energy and produce fewer emissions. Aside from the City's general operational practice of supporting environmental sustainability, there is no official policy standard for vehicle procurement. However, the Fleet Services Section has been successful in converting a large portion of the municipal fleet to more efficient and lower emission models. Vehicle replacements have occurred across most City departments, including the police department.

Most vehicle replacements involve retiring six-cylinder, gasoline-powered vehicles with hybrids that use gasoline-powered engines and battery systems. The Fleet Service Section also purchases E85 (ethanol) compatible vehicles whenever possible, and requests exhaust after-treatment devices on all new diesel equipment. Since 2004, the City has used ultra-low sulfur diesel fuel to reduce emissions, and since spring 2007 the City has used a biodiesel blend (95 percent ultra-low sulfur diesel and five percent biodiesel) to fuel approximately 50 percent of its diesel-fueled vehicle and equipment fleet. By July 2009, the City expects to have 25 percent of its total fleet composed of hybrid or flex-fuel vehicles. In addition, the City's garbage and recycling hauler, Foothill Disposal, utilizes B20 biodeisel blend (20 percent biodiesel) to fuel the vehicles serving Mountain View.

Municipal Buildings and Infrastructure

The City has recently completed the following significant efforts related to municipal buildings and infrastructure, which are very likely to decrease municipal energy demand and greenhouse gas emissions.

¹⁰ All energy use and production data provided by City of Mountain View Sustainability Coordinator Steve Attinger, unless otherwise noted.

- Installation of more efficient lighting, lighting occupancy sensors, and energy-efficient office equipment in most large municipal buildings. Summer and winter building temperatures were also raised and lowered, respectively;
- Installation of a high-efficiency chiller in the Civic Center; and
- Replacement of incandescent traffic signals with LED signals.

The following key building and infrastructure efforts, currently underway, are likely to further decrease municipal energy demand:

- Replacing library parking garage lighting with more efficient LED lighting;
- Completing a Master Lighting Control project, enabling remote access scheduling and shut-down capabilities in City Hall, the Center for Performing Arts, and the Library;
- A pilot project to replace 20 HPS (High Pressure Sodium) streetlights with LED equivalents; and
- Ongoing energy audits of municipal buildings.

Municipal Renewable Energy Production

Gas captured from the City's landfill at Shoreline Regional Park provides energy to several local businesses and City facilities. Specifically, three private businesses in the North Bayshore Area purchase enough gas to produce three megawatts of electricity, and the gas from the landfill also powers micro-turbines that provide 140 kilowatts of electricity for City buildings in the park. The City also powers the California Street parking structure's lighting and elevator with a 90 kilowatt photovoltaic system located on the garage, and uses solar-powered pumps to circulate water in City reservoirs and at Shoreline Sailing Lake. In the future, City staff are likely to explore development of a large municipal solar or wind project, as recommended in the *Environmental Sustainability Action Plan*, provided the California Public Utilities Commission issues a favorable interpretation of AB 2466 (allowing renewable energy producers to receive financial credit for energy they provide to the electricity grid). As part of its effort to certify the new Fire Station 5 as LEED Silver, the City is evaluating the feasibility of installing solar technology.

Community Energy Consumption and Production

All energy-related efforts described thus far have involved municipally owned or controlled infrastructure or energy sources. However, municipal buildings and infrastructure represent under two percent of the total electricity (12,564,246 kilowatt hours) and under one percent of the natural gas (201,772 therms) used throughout the City (shown below in Table 13-3). Energy use in municipal vehicles also represents a small percentage of total energy used in vehicles throughout the City. Therefore, community-wide efforts are essential for achieving overall reductions in energy use, increases in renewable energy deployment, and decreases in Mountain View's greenhouse emissions. Although the City has less direct control over community behavior than municipal infrastructure and operations, it does have regulatory authority in important areas like land use, building and transportation policy. Also it has the ability to incentivize or facilitate various activities. Finally, its successful municipal program offers an excellent leadership example for potential community-wide action.

The City's current level of energy use is shown in Table 13-4 below, where the commercial sector uses 73 percent of all electricity and 43 percent of all natural gas. Understanding the cause of the commercial sector's high overall percentage of energy use (i.e. if it is due primarily to computer equipment, building appliances, lighting, building heating and cooling, or other) could guide efficiency and conservation efforts in the City. These energy figures are the input for the building energy emissions sector of the Mountain View Community Greenhouse Gas Emissions Inventory, described in the Climate Change section of this chapter.

Table 13-4 Total PG&E Energy Consumed in Mountain View, 2005

	Electricity		Natural Gas	
	Kilowatt hours	Percent of Total	Therms	Percent of Total
Residential Sector	162,405,140	24.4%	12,052,342	52.9
Commercial Sector	484,081,502	72.7%	9,783,455	42.9
Industrial Sector	19,269,742	2.9%	954,593	4.2
Total	665,756,384	100%	22,790,390	100%

Source: Cited from inputs into the 2005 Mountain View Community Greenhouse Gas Emissions Inventory, provided by Mountain View Sustainability Coordinator Steve Attinger.

Currently, the City does not devote extensive financial or staff resources to encouraging or requiring energy efficiency and conservation or renewable energy production amongst Mountain View residents. One exception is the City's existing policy of expediting permits and inspections for residential solar energy installations. Nonetheless, establishing appropriate green building standards for private buildings – proposed for FY 2009-2010 in the *Environmental Sustainability Action Plan* and described in the Green Building section of this chapter – will be a critical step in promoting community-wide energy efficiency.

The City's ability to influence energy efficiency in existing buildings will also be critical to achieving sustainability. The primary effort currently planned to address existing buildings, proposed in the *Environmental Sustainability Action Plan* for FY 2009-2010, is to explore implementation of a benefit assessment district in the City. This would allow for upfront financing by the City of sustainability retrofits on private properties, to be paid back into a revolving fund through an amortized tax assessment. This system has been successfully deployed in Berkeley and Palm Desert, California, and other cities around the country.

Finally, encouraging land use policy and transportation behavior that decreases Vehicle Miles Traveled, as described in the Transportation and Land Use section of this chapter and in Chapter 4 Transportation, can play an important role in reducing the energy consumed and emissions produced from transportation.

Table 13-5 Key Indicator Data for Energy Production and Consumption

	Measure
Total electricity consumed throughout the City	665.8 million kWh
Total electricity consumed by municipal buildings and infrastructure	12.6 million kWh
Total natural gas consumed throughout the City	22.8 million therms
Total natural gas consumed by municipal buildings and infrastructure	0.2 million therms
Total megawatts of energy available from municipal non-fossil-fuel sources	3.2 MW ¹¹
% of municipal fleet composed of hybrid or flex-fuel models ¹²	25 %

¹¹ This figure is as of March 2009. It includes municipal landfill gas provided to private customers (3,000 kilowatts), landfill gas used by municipal micro-turbines to power buildings in Shoreline at Mountain View Park (140 kilowatts), and electricity generated by the photovoltaic array on the California Street garage (90 kilowatts). It does not include power produced by solar-power pumps used in city reservoirs and Shoreline Sailing Lake.

¹² The percent of municipal fleet composed of hybrid or flex-fuel models is an estimated amount expected by July 2009. The estimate was provided by Mountain View Sustainability Coordinator Steve Attinger.

13.7 GREEN BUILDING PROGRAM

Green building and retrofitting techniques can reduce waste, improve occupant health, preserve habitat and natural landscapes, reduce air and water pollution and save energy, water and other natural resources. This section describes Mountain View's efforts to promote green building standards and practices. On March 25, 2008, the Mountain View City Council passed a motion that established both U.S. Green Building Council's LEED and Build It Green's GreenPoint Rated as the City's two officially recognized green building standards. Since that time, all applications for new commercial or industrial development greater than 5,000 square feet have had to include a completed LEED checklist, and all new multiple-family residential development applications have had to include a GreenPoint Rated checklist. Several actions proposed in the *Environmental Sustainability Action Plan* are likely to increase the use of the LEED and GreenPoint rating systems in the City.

In terms of municipal operations and buildings, at the March 24, 2009 meeting, the City Council adopted a policy requiring all new and significantly retrofitted City facilities over 5,000 square feet to be designed to be LEED Silver certified. The City intends to achieve LEED Silver for its new Fire Station 5, and has incorporated green building techniques into other new City facilities, including the Senior Center and the Shoreline maintenance facility. The City also prioritizes indoor air quality in its buildings and operations. It is in the process of ensuring that its custodial contractors use low-VOC (Volatile Organic Compound) products, is establishing procurement standards for low-VOC carpet, and is attempting to follow best practices for HVAC maintenance and health. During FY 2009-2010 the *Environmental Sustainability Action Plan* proposes completing a green technology retrofit of the library and enhancing staff members' expertise in green building practices, followed in FY 2010-2011 by a green technology retrofit of another as-yet-undetermined municipal building.

At the community-wide level, the *Environmental Sustainability Action Plan* proposes establishing green building standards for private buildings. The City currently expedites permitting for residential solar installations, as mentioned in the Energy Consumption and Production section above. There are six LEED-certified buildings built or approved in the City of Mountain View¹³:

- Fenwick and West LLP, commercial office building;
- Synopsys Mountain View Campus, commercial office building;
- VTA North Yard, multi-use local government facility;
- Mountain View Technology Center Building III, local government office building;
- Former HP (Middlefield) building, commercial office building; and
- One anonymous certified building.

In sum, new municipal buildings and renovations larger than 5,000 square feet must be designed to be at least LEED Silver certified; however, there is currently no enforced or incentivized green building standard in the City for private buildings. Implementation of the *Environmental Sustainability Action Plan* over the next three years would result in a

¹³ Data is from Jeremy Cohen, LEED Program Assistant at the U.S. Green Building Council, on March 21, 2008, and is provided courtesy of Noah Downing, Community Development Department, the City of Mountain View.

citywide green building program for private development. Requiring that all municipal buildings be built to a LEED Silver standard and retrofitting existing municipal buildings, such as the library are both municipal green building strategies common across California, and help set the stage for citywide green building implementation. However, the level of green building throughout Mountain View as a whole for the next 20-30 years will depend on the nature of green building standards adopted for private buildings. Green building ordinances and programs in several cities throughout California can provide helpful models for this. In the short term, green retrofit efforts in existing buildings can have the most immediate and widespread environmental benefit, while green techniques in new buildings will have an accumulating long-term effect as the Mountain View building stock is slowly replaced.

Table 13-6 Key Indicator Data for Green Building Program¹⁴

	Measure
Number of LEED-certified buildings in the City	6
Number of municipal LEED-certified buildings in the City	0

¹⁴ Ibid.

13.8 TRANSPORTATION AND LAND USE

A sustainable transportation system promotes walking, biking, public transit and carpooling. These transportation modes use less energy and produce fewer emissions than single-passenger automobile use. People who regularly walk, bike or ride public transit increase their amount of physical activity which helps reduce rates of obesity and diseases like diabetes, heart disease, stroke and hypertension. Finally, transit, biking and walking provide an important service for those who cannot afford or are not able to drive. Investment in these modes provides more widespread economic and social opportunities than is the case in communities where driving is the predominant choice. A compact land use pattern that provides a diverse and well-distributed mix of uses, as well as urban design that enhances the pedestrian realm, will help support more sustainable transportation options.

Since the 1992 General Plan, Mountain View has had policies linking land use and transportation. The policies have been implemented through: (1) the adoption of Precise Plans supporting higher density housing near transit, and (2) the adoption of the Transit zone which allows higher commercial and industrial floor near transit stations in return for transit-supportive projects and programs. In 2002, the City won a national award from the American Planning Association for its Transit Oriented Development policies.

A comprehensive description of existing transportation conditions and policies in Mountain View can be found in Chapter 4 Transportation in this report. Chapter 2 Land Use and Chapter 3 Urban Design also describe those topics. Key transportation and land use conditions related to sustainability are described below.

Transportation Mode Comparison

Table 13-7 shows which transportation modes Mountain View residents use to get to work. According to the 2000 U.S. Census, 78.3 percent of residents commute to work by single-occupant automobile, while 12.4 percent commute by public transit, bicycle, walking, or work at home.¹⁵ Mountain View residents commute by single-occupant automobile at a rate higher than the California and national average, and their carpooling commute rate is much lower. On the other hand, rates of commuting by bicycle are significantly higher than the national, state, and county averages, though bicycling only accounts for two percent of total commutes. Rates of commuting by transit and by walking are within the range of the county, state and national average. Encouraging modes besides single-occupant automobiles – through infrastructure and streetscape investment, complete street design, maintenance of existing infrastructure, cooperation with transit agencies, and information and education programs – will increase the environmental sustainability of Mountain View's transportation system and reduce its greenhouse gas emissions.

¹⁵ The Census counts only mode share for trips to work and not trip length or vehicle miles travelled.

Table 13-7 Mountain View Residents Journey to Work Travel Characteristics, 2000¹⁶

Travel Characteristics	Mountain View	Santa Clara County	California	United States
Automobile Total	86.7 %	89.7 %	86.5 %	88.0 %
<i>Single-Occupant Automobile</i>	78.3 %	77.4 %	71.9 %	75.8 %
<i>Multiple-Occupant Automobile</i>	8.4 %	12.3 %	14.6 %	12.2 %
Public Transit	4.8 %	3.6 %	5.2 %	4.7 %
Bicycle	2.0 %	1.2 %	0.8 %	0.4 %
Walk	2.2 %	1.8 %	2.9 %	2.9 %
Other Means	0.9 %	0.6 %	0.8 %	0.7 %
Work at Home	3.4 %	3.1 %	3.8 %	3.3 %

Transit Facilities

The City is serviced by Caltrain, light rail, and bus service. All three services converge at the Mountain View Transit Center (near Castro Street) which is the City's primary transit hub. Caltrain serves two stations in Mountain View (the Mountain View Transit Center and San Antonio). Average weekday ridership at the Mountain View station has increased from approximately 3,000 passengers per weekday in January 2004 to approximately 6,000 passengers per weekday as of January 2007, while average ridership at the San Antonio station has been around 1,000 passengers per weekday since the station opened in 2001.

Light rail service is provided by Valley Transportation Authority (VTA); there are five light rail stops, including NASA/Ames. VTA also provides bus service, with seven local bus lines, one express bus line (the 104) and one limited stop or "Bus Rapid Transit" line (the 522) serving the City. The *Environmental Sustainability Action Plan* proposes working with VTA during FY 2008-2009 to redesign Community Bus Route 34 to provide better transit access and coverage to the community.

The City's primary methods of encouraging public transit are street design that accommodates transit and cooperation with transit agencies to improve service and infrastructure. Given Mountain View's diversity of quality transit service compared to many other cities, there will be important opportunities within the time horizon of the General Plan to decrease greenhouse gas emissions and other negative environmental effects by increasing public transit use.

Bicycle Network

Mountain View's bicycle network consists of approximately 13 miles of multi-use trails (Class I), 26 miles of bike lanes (Class II), 12 miles of bike routes (Class IIIa), and three miles of bicycle boulevards (Class IIIb), for a total of 50 miles of bicycle facilities. Some other roads may be suitable for biking but do not meet standard facility definitions. The *Environmental Sustainability Action Plan* proposes fully implementing bicycle boulevard

¹⁶ U.S. Census 2000, Summary File 3. Data from the 2010 Census will show changes in mode share over the past 10 years.

treatments on appropriate streets during FY 2009-2010, as well as participating in regional efforts to study the feasibility of automated bicycle rentals. The City's 2008 *Bicycle Transportation Plan* defines future investments in bicycling infrastructure in the City. Mountain View's bike accessibility appears to be adequate, but completion of pending, planned, and additional bicycle facilities will probably be necessary to achieve any significant mode shift towards more bicycle riding.

Pedestrian Facilities

The draft *Environmental Sustainability Action Plan* proposes preparing, adopting and implementing a pedestrian master plan during FY 2009-2010. This plan would focus on maintaining and enhancing the City's levels of walkability. Walkability is a key component of diverse sustainability goals: it reduces greenhouse gas emissions and other negative environmental impacts, improves health, may encourage local economic activity, increases social interaction, and helps create a sense of place. LED Countdown Pedestrian Signals have also been installed at all City, County, and State traffic signals in Mountain View to facilitate walkability and reduce energy consumption. The potential Pedestrian Master Plan is discussed further in Chapter 4 Transportation.

Land Use

The *ESTF Final Report's* vision for Mountain View is "a connected system of Healthy Villages: mixed-use community developments that incorporate many of its [sic] residents' needs into a walkable radius."¹⁷ This vision encompasses many of the components of land use that encourage a sustainable transportation system – compact design, connectivity, a mix of uses, neighborhood centers, walkability, and a sense of place. Many of these components were also suggested during the Visioning Phase for the General Plan.

Different land use patterns create different travel patterns and lead to different levels of greenhouse gas emissions. Table 13-8 shows the difference between several "Travel Area Zones" in Mountain View, in terms of average vehicle miles traveled (VMT) and associated greenhouse gas emissions.¹⁸ Areas of the City exhibiting land use components such as proximity to diverse uses and amenities tend to have less driving and fewer associated greenhouse emissions per household. The ESTF vision, therefore, may be a helpful starting point for developing General Plan goals that support transit, biking and walking.

¹⁷ City of Mountain View, ESTF Final Report, p. 154.

¹⁸ Note that the areas shown in Table 12-2 are geographies based on Metropolitan Transportation Commission data, and are therefore different than the neighborhood geographies delineated in the rest of the Mountain View General Plan process.

Table 13-8 Household GHG Emissions for Areas in Mountain View from VMT, 2006¹⁹

Area/Neighborhood	VMT per Household per Day	GHG Emissions per Year (metric tons CO ₂ eq)
Rengstorff Park	20	3.1
San Antonio	21.5	3.3
Old Mountain View	24	3.7
Grant Road to Highway 85	28	4.3

Table 13-9 Key Indicator Data for Transportation and Land Use²⁰

	Measure
Total VMT, 2005	757,808,295
Amount of 2005 VMT from State highways	460,395,085
Number of Light Rail Stops	5
Number of heavy rail stops	2
Number of local bus lines	7
Number of express or BRT lines	2
Total miles of bicycle network	50
Miles of bicycle boulevard	3

¹⁹ Findings based on data from Chuck Purvis, Principal Transportation Planner/Analyst, Metropolitan Transportation Commission, cited from Mountain View ESTF Final Report, p. 155.

²⁰ VMT data is from the Mountain View Community Greenhouse Gas Inventory, courtesy of Steve Attinger, Mountain View Sustainability Coordinator.

13.9 URBAN ECOLOGY

The ecology systems of land and water bodies are unique and valuable assets for urban areas. A healthy ecology is an important component of a sustainable urban environment. Key urban ecology topics for Mountain View include storm water, parks and greenscape, wild species, and water bodies.

Parks and Greenscape

Parks and greenscape are present throughout the City of Mountain View, offering important environmental and health benefits. The City contains 194.73 acres of developed parks and 777.53 acres of regional parks and undeveloped open space. In addition to offering residents a place for recreation, parks and open space provide wildlife habitat, retain storm water, sequester greenhouse gases, clean polluted air, and reduce “heat island effect” (the creation of microclimates with higher temperatures than surrounding areas caused by a lack of shade and the presence of heat-absorbing surfaces like asphalt and concrete).

Trees offer many of the same benefits as parks and open space but can be distributed throughout the City along streets and sidewalks, which also can enhance the pedestrian environment, and/or in backyards and other privately-owned land. The *Environmental Sustainability Action Plan* proposes increasing the number of free Arbor Day trees distributed by the City, beginning in FY 2009-2010, in order to increase tree cover. The existing Arbor Day tree-planting program has planted 3,072 new street trees citywide since 1994. The City received a “Gold Leaf Award” from the Western Chapter of the International Society of Arboriculture for its efforts, and continues to be recognized as a “Tree City USA.” As described in the Water Availability and Use section of Chapter 9 Infrastructure, parks and trees can also require high amounts of water, though native or drought-tolerant species can reduce this demand. The use of recycled water for irrigation (which is currently being deployed in the North Bayshore Area of Mountain View) can also reduce demand for potable water, provided the parks and trees for which it is used are compatible with recycled water’s higher salinity.

Species and Pest Management

Preserving native species is a basic requirement for a sustainable ecological system, and in urban environment like Mountain View, any existing wildlife habitat is rare and valuable. Sensitive biological resources and habitat areas are described in Chapter 12 Environmental Resources. A sustainable ecological system must also be protected from the negative impacts of invasive species and pesticides and herbicides. Pesticides and herbicides can contaminate water, air and food, breed resistance in pests, and have widespread negative health effects on plants, animals and humans. Since June 2003, the City has followed an Integrated Pest Management Plan, which commits to pest management “that reduces or eliminates chemical pesticide use to the maximum extent feasible and practical.”²¹ At the same time, chemical pesticides continue to be applied

²¹ City of Mountain View Integrated Pest Management Plan, June 2003, cited from the ESTF Final Report.

in Mountain View.²² In 2005, at least 832,446 gross pounds of pesticides were applied in Santa Clara County.

Wetlands and Water Bodies

Mountain View contains two main creeks – Permanente Creek and Stevens Creek. Some stretches of both creeks support wildlife and riparian areas, while other areas are channelized or covered and of lower ecological quality. There may be opportunities for creek restoration or naturalization within the time horizon of the General Plan Update.

Mountain View's northern border is along the unique ecosystem of the San Francisco Bay. Only about 52,000 acres of a historic total of 225,000 acres of San Francisco Bay wetlands remains today, so any preserved or restored Bay wetland will contribute to improving the sustainability of the Bay ecosystem.²³ The Army Corps of Engineers, the Santa Clara Valley Water District, and the California State Coastal Conservancy are currently cooperating on the San Francisco Bay Shoreline Study, which covers an area stretching from Palo Alto to Alviso (including roughly the northeast half of Mountain View) that is composed of existing wetlands, old salt ponds now owned by the federal government, and adjacent land. Depending on feasibility, the Study could recommend federal funding for various projects to provide flood protection, restore ecosystems, and provide public access. Federal funding could assist implementation of the complementary South Bay Salt Pond Restoration Project, which aims for restoration of various South Bay salt ponds – including salt ponds adjacent to the North Bayshore Area of Mountain View – into wetland ecosystems. If recommended by the Army Corps of Engineers, projects would be planned in 2010 and construction would begin in 2012.

Storm Water

Implementing a comprehensive storm water management program can reduce pollution and erosion, prevent flooding, and recharge underground aquifers with clean water. Unmanaged urban storm water runoff from cities with tributaries to the Bay can cause polluted and excessive storm water flows that diminish Bay water quality. Most storm water Best Management Practices – including on-site retention and infiltration, harvesting and reuse, evapotranspiration using vegetation, reducing hardscapes, planting trees and landscaping, and amending soils with compost to improve their moisture retention – seek to slow, filter and retain runoff. This is in contrast to many previously conventional approaches to storm water, such as storm channels, that seek to remove it as quickly as possible.

The City requires storm water treatment for certain projects, in accordance with its municipal NPDES (National Pollution Discharge Elimination System) storm water permit issued by the State Regional Water Quality Control Board. There are no existing examples of “green streets” – such as swales and bio-retention areas – in the City, though the City is evaluating the use of these types of treatment controls for projects. Changes pending to the City's NPDES permit will encourage rain harvesting, and passive, landscape-based storm water treatment controls for development projects, and

22 I PAN Pesticide Information for Santa Clara, PAN Pesticides Database – California Pesticide Use: <http://www.pesticideinfo.org/DCo.jsp?cok=43#working>, as cited in the ESTF Final Report, p. 214.

23 San Francisco Bay Conservancy Program, Regional Needs Briefing Book, Bay Area Open Space Council, 1999, http://openspacecouncil.org/projects/conservancy/baosc_conservancy_1999.07.10_regional_needs.pdf, cited from the ESTF Final Report, p. 216.

the construction of “green streets,” for new street and road projects. City departments intend to continue exploring different “green street” storm water treatment controls. Though City staff has recommended or encouraged use of permeable paving materials – which allow for storm water infiltration – in some projects, there is no existing City policy or program to promote them. City staff views permeable paving as appropriate for parking lots, but not for public streets with utilities underneath them. Some downtown alleys use porous, inter-locking pavers. Some private developments in the City also have installed bio-retention systems, and vegetated swales as a means of treating storm water. Mechanical storm water treatment vaults have also been installed at private development projects to treat runoff. Additional information about storm water treatment in Mountain View can be found in Chapter 9 Infrastructure.

Table 13-10 Key Indicator Data for Urban Ecology

	Measure
Acres of Regional Parks and Open Space	777.53
Acres of Neighborhood, Community, and Mini Parks	194.73
Number of Street Trees Planted since 1994	3,072
Number of “green streets” in the City	0

13.10 GREEN BUSINESS AND OPERATIONS

Businesses are a significant component of the built environment and are the basis of most economic activity. As a result, they contribute substantially to the production of greenhouse gas emissions, resource consumption, and many other environmental impacts. There are approximately 4,000 businesses in Mountain View. These businesses, along with local government, have the opportunity to create a significant market for green products by pursuing environmentally sustainable operations and purchasing policies.

Green Businesses

Santa Clara County has a Green Business certification program that evaluates and certifies businesses that have adopted green business practices. To be certified, participants must comply with all environmental regulations and meet program standards for conserving resources, preventing pollution, and minimizing waste. To date, 41 businesses have been certified, including City Hall and the Senior Center.²⁴

Municipal Purchasing Policy

In October 2008, the City Council approved an *Environmentally Preferable Purchasing Policy* designed to demonstrate the City’s commitment to environmental stewardship and human health and safety. From the efficiency of appliances to the toxicity of cleaning products, the new policy makes environmental considerations a standard part of the City’s purchasing process. A handbook is currently being developed to provide more detailed guidance to employees who make procurement decisions.

Green Team

The City’s internal Green Team, comprised of employees from all departments, has a goal of embedding sustainable practices as a core organizational value into City operations. The team focuses on identifying green policies and practices relevant to City facilities and operations and educating and motivating employees to change their behavior. The Green Team has developed a list of 130 actions to reduce waste and resource consumption in City facilities and operations, and is working with department and division heads to prioritize and implement as many of its recommendations as possible.

Table 13-11 Key Indicator Data for Green Business and Operations²⁵

	Measure
Number of Certified Green Businesses	41

²⁴ A directory of Green Certified Businesses in Mountain View and Santa Clara County can be found at greenbiz.abag.ca.gov/shopgreenSCC.

²⁵ Data is from the Santa Clara County Green Business Program as of March 2009, as provided by Lori Topley, Solid Waste Program Manager.

13.11 CLIMATE CHANGE ADAPTATION AND MITIGATION

This section describes Mountain View's climate change mitigation and adaptation efforts. These include the City's greenhouse gas inventory, its adoption of the U.S. Mayor's Climate Protection Agreement, its planned greenhouse gas reduction program, and efforts at adaptation to climate change.

Legislative background

AB 32, The Global Warming Solutions Act of 2006, requires the state of California to reduce its greenhouse gas emissions to 1990 levels by 2020. The state will mandate emissions reductions across several sectors to implement AB 32, but at this point reductions at the local level – such as from buildings or transportation – are only encouraged, not required. SB 375, a bill intended to support the goals of AB 32, provides regional greenhouse gas planning and incentives for land use and transportation decisions that reduce greenhouse gas emissions. The October 2008 CARB (The California Air Resources Board) Scoping Plan, required by AB 32 to define California's approach to achieving emissions reductions, recommends that cities seek to reduce community-wide emissions to at least 15 percent below 2005 levels by 2020.²⁶

U.S. Mayor's Climate Protection Agreement

On October 9, 2007, the City Council adopted Resolution 17244, endorsing the U.S. Mayor's Climate Protection Agreement. The U.S. Mayor's Climate Protection Agreement has been signed and/or endorsed through resolution by a large number of cities across the United States, and states a desire to meet the Kyoto Protocol at a local level. The Kyoto Protocol calls for the United States to reduce its greenhouse gas emissions seven percent below 1990 levels by 2012 (Kyoto sets slightly different reduction targets for different countries). Interestingly, Kyoto, set in 1992, is significantly more aggressive than the California AB 32 target of achieving 1990 emissions levels by 2020. However, Mountain View's support of the U.S. Mayor's Climate Protection Agreement was voluntary and non-binding, whereas California's AB 32 target is binding at the state level and has increased regulatory and implementation support at the local level.

Greenhouse Gas Emissions Inventories

The City has completed a community-wide emissions inventory, and is currently preparing its greenhouse gas inventory for municipal operations, which it expects to complete in May 2009. The community of Mountain View produced 421,428 metric tons of CO₂e²⁷ from transportation and 306,938 metric tons of CO₂e from buildings (100,431 metric tons of CO₂e from residential buildings, 160,273 metric tons of CO₂e from commercial buildings and 46,234 metric tons of CO₂e from industrial buildings). Based on initial data and on what is typical for other California cities, waste is a distant

²⁶ The October 2008 CARB Scoping Plan is available from CARB at <http://www.arb.ca.gov/cc/scopingplan/scopingplan.htm>.

²⁷ Metric tons of carbon-dioxide equivalent (metric tons CO₂e) is the standardized, comparable metric used in greenhouse gas emissions measurements to account for the multiple greenhouse gases – methane, nitrous oxide, carbon dioxide (CO₂), some refrigerants, and others – that have different global warming effects. For instance, according to the 2001 Intergovernmental Panel on Climate Change, a unit of methane has around 21 times the global warming potential as a unit of CO₂, and a unit of nitrous oxide has around 310 times the global warming potential as a unit of CO₂ (though much lower volumes of methane and nitrous oxide than CO₂ are released globally).

third in terms of emissions sources in Mountain View.²⁸ Following completion of the community and municipal greenhouse gas emissions inventories, the City plans to adopt community and municipal greenhouse gas reduction targets by the summer or fall of 2009.

Greenhouse Gas Reduction Program

By spring or summer of 2010, the City of Mountain View plans to complete a Greenhouse Gas Reduction Program, which will provide specific greenhouse gas emissions reduction strategies and estimates of resulting financial, GHG, energy, and fuel savings. Some portion of the City's climate planning should also address issues of climate adaptation. Adaptation issues most relevant to Mountain View include rise in sea level, increased drought, and health effects from hotter weather. Mountain View's climate planning work is being funded in part by a grant from the Bay Area Air Quality Management District's Climate Protection Grant Program.

Climate Change Adaptation and Sea Level Rise

The Intergovernmental Panel on Climate Change (IPCC) has stated that world temperatures will rise by between 1.4 and 5.8 °C (2.5 and 10.4 °F) during the 21st century, depending on the level to which atmospheric concentrations of greenhouse gases rise, and on the eventual effect of such rises.²⁹ These global changes would affect residents of Mountain View in a variety of ways, including:

- Rising sea levels, which could threaten bayfront infrastructure, development, and ecosystems in the North Bayshore Area;
- More frequent heat waves and increased drought;
- More extreme weather events such as storms, floods, and fires; and
- The potential arrival of tropical insect-borne diseases.

Addressing climate change on a local and global level will involve both mitigation, such as reducing energy consumed by buildings and transportation, and adaptation, such as adjusting to drought and rising sea levels.

The San Francisco Bay Conservation and Development Commission (BCDC), which has regulated any filling of the San Francisco Bay since 1965, has recently begun analyzing and planning for sea level rise from climate change. BCDC reports that the level of the Bay increased by seven inches from 1900-2000.³⁰ Future global temperature and sea level rise can only be estimated within a broad range, but there is scientific consensus that some level of sea rise will continue to occur as a result of higher global temperatures. The California Climate Action Team, based on work by the IPCC, has estimated that waters in San Francisco Bay could rise an additional five inches to 36 inches (12-100 centimeters) by 2100, and the BCDC has stated they could rise by up to 55 inches (around 140 centimeters, or 1.4 meters).³¹ BCDC has produced a commonly

²⁸ In most California Cities, transportation is the leading cause of greenhouse gas emissions, followed closely by buildings. Waste is usually a distant third. For instance, waste accounts for around 6 percent of total community emissions in the City of Redwood City's Greenhouse Gas Inventory, for around 5 percent of total community emissions in the City of El Cerrito's Greenhouse Gas Inventory, and for around 2.5 percent of total community emissions in the City of San Mateo's Greenhouse Gas Inventory, and is the third-leading cause of emissions in all three.

²⁹ Intergovernmental Panel on Climate Change, *Working Group III Report: Climate Change 2007: Mitigation of Climate Change*, p. 133.

³⁰ San Francisco Bay Conservation and Development Commission, *A Sea Level Rise Strategy for the San Francisco Bay Region*, Revised September 2008, p. 2.

³¹ *Ibid.*

reproduced sea level rise map of the Bay to illustrate the shoreline areas most likely to be affected by rising sea levels. (See Figure 12-4 in Chapter 12 Environmental Resources) It has only mapped the effects of a one meter rise and it explicitly states that maps are illustrative, that their accuracy is limited by available geo-spatial data, and that they should not be used for detailed planning purposes.³² However, in general, the low-lying areas of the South Bay, including the North Bayshore Area of Mountain View, would be largely inundated if sea level rose one meter (around 39 inches).

The existence of storm and tidal surges – which are unpredictable, difficult to map, affected by local topography, and carry the greatest potential for damage to coastal infrastructure and ecosystems – are another reason the effects of Bay level increase are difficult to predict. However, while individual surge events are unpredictable, the overall likelihood and height of surges would consistently increase with a rise in Bay level.

Currently, BCDC does not have authority to regulate coastal development, though it is actively advocating for the state legislature to extend its power to regulate bayland development, to require an inter-agency “Bay Plan” that would regulate bayfront development in relation to rising Bay levels, and for the preparation of detailed Bay level rise maps that could be used for local planning purposes. It is likely that any planning undertaken by BCDC would be based on a 50-year time horizon. In the absence of certainty and regulation, BCDC and other groups advocate caution when developing in low-lying areas.

Table 13-12 Key Indicator Data for Climate Change Adaptation and Mitigation³³

	Measure
Community greenhouse gas emissions from buildings	306,938 metric tons CO ₂ e
Community greenhouse gas emissions from transportation	421,428 metric tons CO ₂ e

³² San Francisco Bay Conservation and Development Commission, *San Francisco Bay Scenarios for Sea Level Rise South Bay*, accessed March 2009 at http://www.bcdc.ca.gov/media/planning/CCP_SouthBay.jpg.

³³ All data is from the 2005 Mountain View Community Greenhouse Gas Emissions Inventory.