

SAN FRANCISCO FIRE DEPARTMENT

CITY AND COUNTY OF SAN FRANCISCO

Title:	Departmental Climate Action Plan
Department:	San Francisco Fire Department Chief Joanne Hayes-White
Data Year:	Fiscal Year 2009-2010
Authors:	Rhab Boughn, Compliance Officer Tania Fokin, Senior Administrative Analyst
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### 1. Introduction

#### **Carbon Footprint Summary**

The Fire Department's carbon footprint includes the consumption of energy (electricity and natural gas) at SFFD's owned, leased and employee-occupied facilities, and liquid fuels (gasoline, diesel, bio-diesel and CNG) purchased by the Department and dispensed in SFFD vehicles.

In FY09/10, the Department produced 4,346.54 metric tons of CO2e, down 1% from FY08/09. By factoring in the amount of carbon sequestered by the trees on SFFD property, the net amount of carbon emissions produced in FY09/10 is 4,336.41 metric tons CO2e.

The chart below shows the total emission by source. The chart demonstrates that about 70% of the Department's total carbon emissions come from the use of liquid fuels. Also demonstrated is the high amount of carbon emissions produced from the consumption of natural gas. However, within the past year, the Department has reduced its overall electricity usage by 6%.



#### **Climate Action Goals and Implementation Plans**

Decrease natural gas usage with conservation efforts and facility improvements

- Distribute periodic energy conservation best practices reminders
- Encourage facility supervisors to take active role in energy usage monitoring
- o Boiler: Ensure windows are closed when heat is on
- Water heater: Limit length of showers
- Promote implementation of energy-efficient upgrades in facilities undergoing construction upgrades
- o Introduce solar-thermal upgrades to Fire Stations where applicable

Reduce emissions from liquid fuel usage

• Continue fuel conversion from diesel to bio-diesel

- Remove older vehicles/apparatus from frontline use and replace with those that are cleaner and more fuel-efficient
- o Explore possibility of obtaining a fleet of electric vehicles

Increase waste diversion rate

- Distribute periodic recycling/composting reminders and conduct zero-waste refresher trainings
- Optimize blue, green and black bin size by conducting waste audits
- Review the contents of medical waste with ambulance crews to find additional recycling opportunities
- Increase participation in the GreaseCycle Program

Decrease electricity usage with conservation efforts and facility improvements

- o Distribute periodic energy conservation best practices reminders
- Encourage facility supervisors to take active role in energy usage monitoring
- Promote implementation of energy-efficient upgrades in facilities undergoing construction upgrades

### 2. Departmental Profile

#### **Departmental Mission**

The mission of the Fire Department is to protect the lives and property of the people of San Francisco from fires, natural disasters, and hazardous materials incidents; to save lives by providing emergency medical services; to prevent fires through prevention and education programs; and to provide a work environment that values health, wellness and cultural diversity and is free of harassment and discrimination.

#### **Departmental Budget**

Budget FY 09/10 = \$271,983,974

The Fire Department has six divisions in its operating budget: Administration, Fire Investigation, Operations, Fire Prevention, Support Services, and Training. The annual project budget also has allocations for uniform and personal protective equipment purchasing. In addition, the Department receives funding for its Homeland Security and Airport Divisions, as well as partial funding from the Port for the Fireboat and partial funding from the Treasure Island Development Authority for the Fire Station on Treasure Island.

The funding for the Auxiliary Water Supply System (AWSS) positions and capital has been transferred to the Public Utilities Commission, which took place the latter part of FY09/10. In addition, the Exam Unit of the Fire Department has been transferred to the City's Department of Human Resources.

The Department receives about 75% of its operating budget from the General Fund; the remaining 25% comes from Fire Department revenue, the majority of revenue is generated from the provision of emergency medical services, ambulance transports (?), and fire prevention services and associated fees.

#### **Number of Employees**

As of February 1, 2011, the Department employs 1,486 persons, including both uniformed and non-uniformed personnel.

Uniformed Fire Suppression Personnel = 24 hr work schedule; 31 day tour (48.7 hrs/week)	1,233
Uniformed Ambulance Personnel = 10 hr work schedule (40 hrs/week)	146
Uniformed & Non-Uniformed Personnel = 8 hr or 10 hr work schedule (40 hrs/week)	107
TOTAL PERSONNEL =	1,486

In May 2010, the Department's 11 stationary and fire protection engineers assigned to the Auxiliary Water Supply System were transferred to the SF Public Utility Commission, and in August 2010, 14 employees from Presidio Fire (12 firefighter/EMTs and 2 paramedics) were hired after that federally-operated fire department was permanently closed.

#### Facilities

During FY 09/10, the Fire Department occupied 41 Fire Stations in San Francisco, 1 Fire Station on Treasure Island, 3 Fire Stations at San Francisco International Airport, 2 In-Service Training Facilities, 1 Emergency Medical Response, Arson and Logistics Facility, 1 Fleet Maintenance and Repair Facility, and 1 Facility housing SFFD Headquarters, Administration and the Bureau of Fire Prevention. The Department also has 3 inactive Fire Stations, used for various community service activities, and the Historic Dennis T. Sullivan Memorial Chief's Residence.

A map of all active Fire Stations is available on-line at the following URL: http://38.106.4.187/index.aspx?page=176

The Department owns and manages all facilities except for the following properties: the SFFD Airport Division Facilities are property of the San Francisco International Airport; the Fire Department's Training Facility on Treasure Island is leased through the Treasure Island Development Authority, and; the Bureau of Fire Prevention's Plan Check offices at 1660 Mission Street are operated by the Department of Real Estate

In May 2010, the management and operations functions of all Auxiliary Water Supply System facilities, which were owned by SFFD, were transferred to the San Francisco Public Utilities Commission.

#### Vehicles

The Department owns and operates its fleet of fire suppression and EMS/rescue apparatus, which includes fire engines, fire trucks, ambulances, fire and rescue boats, and specialized rescue, support and command staff vehicles. Frontline vehicles are the vehicles used on a daily basis. When these vehicles break down or undergo repairs or service, relief apparatus are placed in service. This prevents any disruption in community fire suppression and emergency medical services responses.

The Department's fleet of passenger vehicles is used for fire prevention activities and other support functions. The Department also maintains several historical fire suppression apparatus. A summary of the Department's fleet as of 6/30/10 is listed below:

FLEET SUMMARY	COUNT
HEAVY-DUTY VEHICLES	113
LIGHT TRUCKS	111
PASSENGER VEHICLES	61
NON-HIGHWAY/CONSTRUCTION VEHICLES	3
SHIPS & BOATS	6
TOTAL	294

#### **Departmental Contact Information**

Implementation of the Department's Climate Action Plan is overseen by Assistant Deputy Chief Tom Doudiet, Chief of the Division of Support Services.

Authors of the SFFD Climate Action Plan are the SFFD Climate Liaisons: Compliance Officer, FF/PM Rhab Boughn, and Senior Administrative Analyst, Tania Fokin.

For questions concerning the Department's Climate Action Plan, please contact:

San Francisco Fire Department Department Headquarters 698 Second Street San Francisco, CA 94107 (415) 558-3403 www.sf-fire.org

### 3. Departmental Carbon Footprint

To determine the Department's carbon footprint, the following parameters were taken into account:

- Electricity Usage at SFFD Owned/Occupied Facilities (kWh)
- Natural Gas Usage at SFFD Owned/Occupied Facilities (Therms)
- o Liquid Fuel Purchased/Dispensed into SFFD Assigned Vehicles (Gallons)

Usage amounts were then converted into metric tons CO2e emissions. Conversions for electricity and natural gas include CH4 and N2O emissions, whereas conversions for liquid fuels do not.

CO2e emissions produced due to SFFD's water usage are being represented by the San Francisco Public Utility Commission in the City-wide report produced by the SF Department of Environment.

In cases where a facility is partially occupied by SFFD, usage was determined by the percentage of building space occupied, or by the percentage of building occupants employed by SFFD. Liquid fuels accounted for include fuel amounts delivered to SFFD fuel tanks and vehicles, and fuels dispensed at facilities monitored by SF Central Shops. Fuel dispensed while on mutual aid responses is excluded. Department operations at the SF International Airport are not represented in this report.

The Department's carbon footprint has also been offset by inventorying the number, size and type of trees on SFFD facility property and calculating their carbon sequestration rate.

### 3a. Facilities – Energy & Water Use and Reduction Measures

#### **Facilities Verification**

The list of facilities used by SF Environment to calculate the FY09/10 Departmental carbon footprint has been verified by the Fire Department's Climate Liaisons to be accurate and complete.

# Fiscal Year 2009-2010 Carbon Footprint from Consumption of Electricity, Natural Gas and Steam

EMISSION SOURCE	CONSUMPTION	CO2e EMISSIONS (metric tons)	COST
ELECTRICITY (kWh)	4,518,960	96.43	\$205,280.54
NATURAL GAS (Therms)	233,404	1,241.62	\$209,949.60
STEAM (lbs)	0	0	0
TOTAL		1,338.05	\$415,230.13

#### **Energy Efficiency & Conservation**

The Department's energy efficiency projects, funded by the SF Public Utilities Commission (SFPUC), are listed below. Additional energy conservation measures are identified in the Green Buildings section.

#### SFPUC Funded Lighting Upgrades:

In FY 09/10, SFPUC upgraded the lighting at 24 Fire Department facilities, after having audited all SFFD properties in FY 08-09. The Stations selected were those expected to provide the best return for the cost. Construction began in October of 2009 and was completed in March of 2010. SFPUC expected the savings to be 243,000 kilowatts per year which would save SFFD \$9000 per year and PUC \$21,000 at the current rates. The drop in usage per location was expected to average 10%. In reality at 64% of the Stations, the drop averaged 15%. However, at the remaining 36% of the Stations the rate increased by 15%. Several factors may have contributed to this increase. New generators were installed at 3 of those Stations and a major construction project occurred at another one of the sites.

#### SFPUC Funded Window Repairs/Replacement:

In FY 09/10, SFPUC funding enabled SFFD to install energy efficient windows at 2 Fire Stations. In FY 10/11 windows will be changed at 2 other Fire Stations. Replacing the old and damaged windows with energy efficient windows is expected to significantly improve the energy efficiency at these Fire Stations.

#### SFPUC Funded HVAC System Upgrades:

In FY 09/10, SFPUC provided funding to renovate the HVAC system at one Fire Station. The previous heating system did not allow the thermostats to be

adjusted and the heat had to be turned on and off at the breaker. The SF Department of Public Works (DPW), in collaboration with SFPUC, designed a new system of controls which will allow SFFD and DPW to monitor the HVAC system at the Station remotely and will also give the Station greater control over temperature regulation. The design of the system was completed in FY 09/10 and the system will be installed in FY10/11.

#### Fiscal Year 2009-2010 Water Consumption

The amount and cost of water used by the Department is summarized in the table below. Facilities are represented in two groups: Auxiliary Water Supply System (AWSS) facilities and Fire Stations and Support facilities (all non-AWSS facilities).

FACILITIES	WATER CONSUMPTION (gallons)	COST
FIRE STATIONS & SUPPORT FACILITIES	12,145,559.97	\$54,728.88
AUXILIARY WATER SUPPLY SYSTEM	180,819,280.00	\$795,617.94
TOTAL	192,964,839.97	\$850,346.82

#### Water Efficiency & Conservation

#### SFPUC Water Audit:

SFPUC completed a water audit of all Fire Department facilities in FY 08/09. At the end of FY09/10, SFFD staff met with SFPUC's Water Division to review the survey results which are attached here as **Appendix A**. The survey discusses potential water reduction and costs savings through the installation of low-flow showerheads, faucets and other water-saving devices.

#### Auxiliary Water Supply System:

The age (100 years), the number of miles of in-ground high pressure pipelines (135) and a multitude of joints and fittings throughout the City are a cause of ongoing leaks in this 12 million gallon dedicated firefighting system. The Earthquake Safety and Emergency Response Bond, passed in June 2010, sets aside \$35 million to upgrade the system, which was transferred to the SFPUC by order of Mayor Newsom in May 2010. The work will be completed over the next five years.

#### Energy & Water Conservation Program:

The Department is continuing its Energy and Water Conservation Program. Water and energy usage are monitored at all Department facilities and quarterly reports are provided to the Division of Support Services for analysis and distribution. The Energy and Water Conservation Program has become a valuable tool for helping the Department conserve water and energy, as well as financial resources. A thorough analysis of the financial savings as a result of this program has not yet been conducted.

#### **Green Building & Renewable Generation**

The Department currently has the following two green building projects underway:

#### ESER Bond Funded Renewals and Renovations:

In June of 2010, the voters of San Francisco approved the funding of an Earthquake Safety and Emergency Response (ESER) bond which will provide SFFD with approximately \$60 million to perform seismic upgrades and address health and safety issues at Fire Stations. Additionally the bond will fund construction of the new Mission Bay Fire Station which is described in greater detail in the New Fire Station Construction section below.

#### Seismic and Comprehensive Projects:

Seismic upgrades will be performed at 3 Fire Stations, as well as at Station 49, the Ambulance depot, and the Bureau of Equipment located on 25<sup>th</sup> Street. All seismic projects will include a comprehensive remodel. Additionally, three other stations not requiring seismic work, will receive comprehensive upgrades. Comprehensive remodels will upgrade, among other things, all energy related systems, including windows, HVAC systems, and roofs to LEED Silver standards, as well as water conservation plumbing upgrades. Each location will also be reviewed for potential alternative energy modifications such the addition of solar thermal, bio-swale, solar panels, and green roofs. Alternative energy modifications will be done based on cost benefit analysis.

#### Focused Scope Projects:

Focused scope projects will be completed at approximately 11 to 14 Fire Stations, based on funding availability. These projects primarily involve roof, shower pan and window replacement. All roofs will be at a minimum white coated; all windows will meet PUC's energy efficiency standard; and all shower pan projects will involve water efficiency plumbing upgrades. If funding permits, toilets may be upgraded at the same time.

#### New Fire Station Construction:

The San Francisco Fire Department currently has two new fire stations in design. One is being sponsored by the Museum of Modern Art and will be a LEED Gold Fire Station that will replace the current Fire Station 1. The second building is the new Mission Bay Fire Station which will be constructed using ESER Bond funding. It will be part of the new Public Safety Building, housing Police Headquarters, a Police Station and the new Fire Station. This building is also being designed to meet LEED Gold standards. It is currently entering the schematic design phase.

Though the Fire Department does not have LEED certified professionals, DPW, private architects and the engineers involved in these projects are LEED certified. The primary challenges regarding LEED design include the costs associated with meeting LEED standards.

Both new fire stations, presently in the planning stages, are being designed to the highest current efficiency standards for buildings of this type. They will include: sections of green roof; bio-swale; and building systems (windows, HVAC, lighting, showers, toilets and faucets) which will meet Energy Star-rated efficiency criteria.

### **3b. Fleet – Fuel Use & Reduction Measures**

#### **Fleet Verification**

The list of vehicles and liquid fuels consumption values used by SF Environment to calculate the FY09/10 Departmental carbon footprint has been verified by the Fire Department's Climate Liaisons to be accurate and complete.

#### Fiscal Year 2009-2010 Carbon Footprint from Mobile Combustion of Fuel

The amount and cost of fuel used by the Department is summarized by fuel type in the table below.

FUEL TYPE	CONSUMPTION (gallons)	CO2e EMISSIONS (metric tons)	COST
UNLEADED	59,120.10	520.85	\$126,351.74
DIESEL	126,136.00	1,190.91	\$294,018.06
RED-DYE DIESEL (MARINE)	17,338.00	164.02	\$41,781.53
BIO-DIESEL (B-20)	113,560.00	1,136.96	\$256,814.01
CNG	1,530.34	9.35	\$3,015.01
TOTAL		2,917.30	\$753,297.75*

\*includes CA diesel excise tax

#### Removal of Vehicles 12 Years Old or Older

All City departments are guided by the new SF Ordinance 278-10, Healthy Air and Clean Transportation Program, which states that all passenger vehicles and lightduty trucks in the municipal fleet that are 12 years old or older shall be remove from their fleet, beginning no later than July 1, 2015.

While there are no statutory requirements dictating minimum standards and useful life for firefighting apparatus, the recommendations provided by the National Fire Protection Association (NFPA) are widely recognized as the industry standard. The NFPA recommendations are accepted to be the minimum standard requirements for vehicles and apparatus, often based on rural and suburban communities with relatively low call volume and less challenging terrain.

The Department's established Vehicle Replacement Program, which is guided by NFPA Standards for Fire Apparatus and Ambulances, longevity standards for maintaining Frontline and Reserve vehicles, as well as the proportions of Frontline to Reserve vehicles within the Fleet.

The SFFD uses the NFPA standards as a general guideline for the specifications of its vehicles, however, due to the Department's high call volume, topography and street conditions, the Department imposes standards more stringent than those minimum standards prescribed by the NFPA. These standards are as follows:

Frontline Fire Engines -	10 years	Reserve Fire Engines -	+5 years
Frontline Fire Trucks -	15 years	Reserve Fire Trucks -	+5 years
Frontline Ambulances -	4 years	Reserve Ambulances -	+3 years

The ratio of Reserve to Frontline Fire Engines and Trucks is 1:3; for Ambulances, the ration is 1:2. After a vehicle's Reserve lifespan has expired, it is recommended the vehicle be salvaged.

Over the past ten years, as a result of financial constraints, the Department has been greatly challenged in attempting to maintain these more stringent vehicle replacement standards. Nonetheless, the Department continues to utilize its available resources as judiciously as possible to ensure the safety and reliability of its fleet.

Due to the steep hills and narrow streets which characterize many areas of San Francisco, numerous carefully designed modifications must be specified and incorporated into engines, trucks, ambulances and rescue vehicles, which would not be considered necessary in other jurisdictions.

In reference to the Healthy Air and Clean Transportation Program Ordinance, the Department includes all passenger vehicles (cars and carts) and all non-specialized fire/EMS/rescue light truck vehicles (pickups, SUVs and vans).

VEHICLE TYPE	TOTAL	> 12 YEARS OLD	PERCENT
PASSENGER VEHICLES	66	15	23%
LIGHT TRUCKS (SUV, VAN, PICKUP)	54	18	33%
TOTAL	120	33	28%

The purchase and replacement of fire apparatus and other support vehicles should be a regular item of the Fire Department capital budget, as the benefits of supporting a strong Vehicle Replacement Program are many. Improvements in apparatus design are introduced, since newer vehicles are more fuel efficient and less polluting, maintenance costs become more favorable, operating efficiency increases and equipment remains more reliable.

#### Alternative Fuels, Fleet Conversion and/or Reduction

#### **Bio-Diesel Program:**

The San Francisco Fire Department was the first City agency to pilot a biodiesel program. Three of our fuel stations successfully converted to biodiesel in 2007. These fuel stations are located in the Southeast quadrant of the City and were selected due to the health concerns in the neighborhood regarding air quality and high incidents of childhood asthma.

Currently 48% of the diesel fuel we use is bio-diesel. All of our Ambulances, 6 Frontline Engines, and 2 Frontline Trucks, which accounts for 36% of the Frontline fleet, use bio-fuels.

In 2008, SFFD had anticipated to move forward with additional conversions to bio-diesel. However, recommendations from the SF Department of Public Health (DPH) advised waiting, due to an impending State regulation prohibiting the storage of B20 in underground tanks. Since all of the Department's aboveground tanks had already been converted, SFFD decided to heed the advice of DPH and wait.

In 2009, the proposed State regulation was given a waiver until 2012. Due to the waiver, the City is now requesting that the SFFD continue with the Department's Bio-Diesel Program; the Department is once again implementing the conversion plan.

The Department intends to convert one fuel station at a time, with a 4-month period between conversions, to ensure that vehicles of varying makes, models and ages will be able to operate properly using B-20 fuels.

During the initial conversion, the ambulance fleet experienced problems with the bio-diesel causing deterioration to the liner of their fuel tanks. As a result all of the tanks were sent to the manufacturer to be re-lined. To date, he new lining appears to be compatible with bio-diesel fuel.

In addition, in 2010, some of the ambulances experienced problems with the fuel injectors becoming clogged with fungus, presumed to be due to the long-term use of bio-diesel. Central Shops is trying to address the problem by adding a cleaner to the ambulance fuel system during their regularly scheduled maintenance.

The issues experienced with the ambulances have not been apparent with the fire apparatus using bio-diesel. However, due to the variety of makes, models and ages of the diesel motors in the vehicles in the fleet, in order t assure reliable operation the Department considers it prudent to obtain biodiesel performance ratings from the manufacturers of these motors before vehicles are fueled with bio-diesel.

#### Pool Cars:

The Department currently maintains 5 pool cars which are shared by 75 members at Headquarters. Staff members will often carpool to meetings in order to reduce that the number of overall trips.

#### Bicycle Fleet:

The Department has received 3 grant funded bicycles which Fire Inspectors and Headquarters staff may use during the day as alternative means of transportation.

#### Electric Vehicles:

The Department would be interested in exploring an electric vehicle program at Headquarters for the Fire Prevention and administrative staff however, it should be noted that we currently do not have a charging station.

### 4. Other Sustainable Practices

To lower the Department's carbon footprint and lessen our overall environmental impact, the Department is involved in the following programs and projects:

- Recycling and Composting Program
- GreaseCycle Program
- Commuter Benefits Program and Transportation Survey
- Bicycle Fleet Program
- SFApproved.org Green Product Purchasing Program
- Energy Efficiency Best Practices
- SF Urban Forest Program
- Healthy and Sustainable Food SF Directive
- San Francisco's Natural Areas Program and Sutro Stewards

Methods for reducing the Department's carbon footprint from the front-end include recycling and composting, encouraging alternative forms of transportation for employees, purchasing green products, and establishing best practices for the conservation of water and energy.

The Department is also involved in preserving our City's natural area resources, by assisting in the preservation of the Mission Blue Butterfly habitat on the SFFD property on Twin Peaks, and by acquiring an oil boom for the Fire Boat to respond to local oil spill incidents, similar to the Cosco Busan in November 2007.

The Department's carbon footprint has further been offset by calculating the annual carbon sequestration rate of the trees found on SFFD property. The trees were inventoried by number, size and type and sequestration rate was determined by the Center for Urban Forest Research's Tree Carbon Calculator.

### 4a. Zero Waste

SFFD was the first Fire Department in the United States to begin a composting and recycling program. All Department facilities have had on-site recycling and composting programs since April 2003. The programs were initially implemented with the assistance of the Department of the Environment (DOE). In 2007, the Fire Department conducted a refresher course at each location with DOE's assistance. Since the inception of the program, the Department has saved over \$784,000 by diverting waste from landfill by composting and recycling.

#### Waste Assessment Questionnaire

The Captain of each Fire Station is designated as the recycling coordinator for that facility. Each Captain or their designee has submitted a Waste Assessment Questionnaire, evaluating their recycling and composting program.

#### **Trash Diversion Rate**

The Department's trash diversions rate for FY09/10 was just over 83%, unchanged from the previous year, with only 17% of our total waste that went to landfill. With periodic reminders and refresher trainings, SFFD's diversion rate could easily be increased, as materials that are either recyclable or compostable may still be throw into the trash.

#### GreaseCycle

SFPUC oversees a cooking oil recycling program, GreaseCycle, which drop off locations throughout the the City. They also offer a cooking oil pick up service. Currently 10% of the Department's Fire Stations are participating in this program. Clogs caused by grease are a common problem seen at Fire Stations. A goal this year is to expand the GreaseCycle program to at least half of the stations, helping to decrease costs associated with plumbing repairs and maintenance.

#### **Medical Waste Management**

The Department has recently obtained a new provider for the disposal of medical waste. The new provider offers better rates for monthly and weekly pick ups and quickly corrects any errors in billing or scheduling. This change has resulted in additional savings for the Department.

Many items that currently end up in the medical waste bins could be recycled. One of this year's goals is to review the operations in the ambulances and see if we can incorporate some recycling on board.

### 4b. Employee Commute

#### **Transportation Survey**

In order to understand how to make alternative transportation more attractive and user-friendly, understanding how people are getting to work, and what barriers or job functions make alternative transportation difficult, need to be known. This information is gathered through the Department's Transportation Survey.

The Department conducted its Transportation Survey from November 8, 2010 to December 17, 2010 using the Department's internal network program, specially designed by SFFD's IT Engineers. This enabled maximum accessibility for the majority of personnel. For those employees with limited access to computer workstations, a paper survey was distributed.

Survey participation and responses are as follows:

Total Number	Total Number of	Survey
of Employees	Survey Participants	Participation
1486	796 (709 network + 87 paper)	53.57%

Total Number of	Count of	Count of Alternate	% Using
Personnel on	40 Hr Work Week	Transportation	Alternate
40 Hr Work Week	Survey Participants	Users	Transportation
107	79	31	29.0%

Some of the challenges facing the Department in promoting alternative transportation are work assignment and work schedule.

The majority of Department employees work 24 hour shifts in the Fire Stations, starting at 8:00am. Most have regular assignments at a designated Fire Station, but many, once arriving at work, must pack their bags and equipment, and commute to another Fire Station across town where they are needed.

Department employees assigned to Ambulances work 10 hour shifts, report to a single facility, but can be assigned a shift that can start and end at any time of the day or night; times when public transportation is not available.

The number of Department employees with a regular commute-hour work schedule is few by comparison. However, this is the pool of employees where the Department has the most opportunity for promoting alternative modes of transportation. According to the survey results, 29% of employees in this group are already using alternate transportation.

#### **Commuter Programs**

Because transportation has a major impact on air quality in the City, the primary focus is to reduce vehicle emissions by reducing vehicle trips taken. The City offers the following programs to promote the use of alternative transportation to its employees:

Commuter Benefits Program City Hall Bike Room City Bicycle Fleet Rideshare Matching Assistance Emergency Ride Home Program

The Department also has a small fleet of pool cars at Department Headquarters used to encourage the use of alternative transportation commuting to and from work.

The Department regularly distributes e-mails from the Clean Air and Transportation Program to employees and has included Commuter Program information in its internal announcements during the Transportation Survey.

Future internal employee outreach efforts planned include:

- Presenting Commuter Program information at staff meetings and during trainings
- Providing a table with Commuter Program information at focused facilities
- Including Commuter Program information on the Departmental intranet
- Including Commuter Program information in new employee orientations
- Posting approved flyers and promotional items at all facilities
- o Implementing an on-line transit bulletin board and/or intranet for ride-sharing
- Encouraging and promoting use of Bike Fleet Program

To encourage alternative transportation options for the employees working at Fire Stations as work assignments may change from day to day, the Department is exploring the possibility of providing a shuttle system for employees and their equipment as suggested by the Department of Environment.

### 4c. Green Purchasing

The results of the SFFD's Buy Green Scorecard are attached as Appendix B.

The Department's goals this year are twofold:

- Complete a green purchasing consultation.
- Train all Accounting staff to log all purchases at the item-level commodity code in the ADPICS program (not the group, subclass, or class-level code), so that our reports accurately reflect our purchases.

The Department will be meeting with the Department of Environment (DOE) to determine which green cleaning products may be appropriate for Fire Department use. A major concern the Department has regarding purchasing green cleaning products is the effectiveness of the products available on the SF Approved List against infectious diseases, such as MRSA, Hepatitis B/C and Tuberculosis. Not using an appropriate or approved disinfectant is hazardous to Department personnel, as it increases the potential for exposures to blood or other potentially infectious materials. Any disinfectant approved for infection control must be proven effective by industry standards and incorporated into the Department's Infection Control Policy as a Department-approved product.

As part of workers safety legislation, OSHA requires that work surfaces be cleaned with an appropriate disinfectant. Appropriate disinfectants include a diluted bleach solution and EPA-registered antimicrobial products. Appropriate or approved disinfectants are determined by the EPA (U.S. Environmental Protection Agency), which oversees the registration of anti-microbial products.

The Department has a contract with a green vendor which maintains our pest control at our facilities. We also contract with the SF Department of Public Health to pick up our hazardous waste products, such as batteries and fluorescent bulbs. Automotive product waste, paint or chemical waste is collected at the Fire Stations and delivered to Central Shops by SFFD's Bureau of Equipment for recycling or proper disposal.

### 4d. Information Technology

Energy consumption associated with computer workstations is the City's single largest use of energy for the City's IT operations. Energy consumption can be reduced by remaining vigilant to purchasing energy efficient computers and by ensuring that power management tools are in place, consuming energy only when in use.

The Department's policy on the purchase of new equipment ensures that purchases of new computer and electronic equipment meet the Electronic Product Environmental Assessment Tool (EPEAT) Gold or Silver standard, when available.

The Department has also been analyzing its monitor inventory and replacing CRT monitors with LCD flat screen monitors, thereby reducing energy consumption and eliminating exposure to harmful radiation. Additional measures include the removal and/or discontinued issue of personal printers, upgrading printers to duplex capabilities to save paper resources, and considering the use an Eco-font to reduce the consumption of printer ink.

Due to the nature of the Department's mission, enabling energy-saving modes on emergency response and patient care documentation computer systems is not operationally feasible. However, energy-saving practices have been applied to all other non-emergency response computers with the following settings:

Turn off monitor:	After 5 minutes
Turn off hard disks:	After 30 minutes
System standby:	After 1 hour
Screen saver:	Disable

An additional measure the Department has implemented includes providing energy conservation reminders on all non-emergency response computers. The Department will also be distributing memos regarding energy-saving practices, and investigating new capabilities of centrally controlling energy-saving settings using specialized software.

### 4e. Carbon Sequestration / Urban Forest

The Department acknowledges the importance of the City's Urban Forest and the many benefits it provides, from increasing property value to reducing atmospheric carbon dioxide, and supports the preservation and enhancement of this valuable resource.

The Department has conducted a Tree Audit on the properties and in the areas surrounding the facilities currently managed. By doing so, the benefit the trees offer by way of carbon sequestration can be measured. The inventory also provides an opportunity to realize areas where additional trees may be planted.

Each tree was identified by species or type and measured for diameter at breast height (DBH). The data was entered into the US Forest Service Climate Change Resource Center, Center for Urban Forest Research's (CUFR) Tree Carbon Calculator. Results were recorded for carbon sequestration rate and amount stored.

The results of the Tree Audit are as follows:

SITES AUDITED	49
TOTAL TREE COUNT	530
TOTAL CO2 STORED (lbs)	395,82
CO2 STORED/YEAR (lbs/yr)	22,278
CO2 STORED/YEAR (metric tons/yr)	10.13

Since the CUFR Tree Carbon Calculator offered a limited number of tree species to choose from, the Department developed a system to account for tree species not presented in the Carbon Calculator program. The system that was devised also accounted for conditions where exact tree species were not able to be identified, grouping trees by type (deciduous, conifer or palm) and further by basic leaf shape (simple, palmate or compound). Fruit-bearing deciduous trees with simple leaves were given its own category.

### 5. Community Wide Impact

When responding to emergency 911 calls, Fire Department personnel are focused on the task-at-hand, whether it is putting out fires or providing emergency medical care. The Department is most visible to the public at these times, when responding to emergencies.

It may seem that educating the public about climate change and sustainable practices is not consistent with the Department's primary Mission. However, there are other opportunities where the Department interacts with the public in non-emergency situations, where the Department's role can have a beneficial influence on sustainable practices community-wide. One of the ways is striving to become a model Department in our efforts to be Green.

Below are other examples of the efforts the Department has been taking on, beyond our day-to-day operations, in an effort to become a more sustainable Department, preserve our natural area resources, and to reduce our overall environmental impact.

#### Promote the Use of Cleaner Fuel & Lower Emissions Vehicles

To raise awareness and demonstrate to the community the Department's commitment to the use of cleaner fuels, the Department intends to attach labels to bio-fuel and CNG vehicles that will be clearly-visible from the street. This currently includes all Ambulances, Fire Apparatus in the Southeast area of the City, and all CNG Support Vehicles.

A City-wide labeling system may be useful for use on all City vehicles using cleaner fuels, demonstrating the City's unified commitment to emissions reductions.

As previously mentioned, the Department is planning to expand its Bio-Diesel Program throughout the City.

#### **Respond to Environmental Hazards**

In January 2009, the Department was awarded funds from the CA Department of Fish and Game to purchase oil spill response equipment. The response equipment provides the Department with the ability to deal with the immediate needs of an oil spill and to assist in a unified spill containment response to protect local resources.

The acquisition was in response to the oil spill incident in November 2007, when the container ship, Cosco Busan, collided with the Bay Bridge. The collision caused the release of 54,000 gallons of bunker fuel oil into the Bay, killing more than 20,000 birds and resulting in clean-up costs in excess of \$61 million.

An Oil Spill Task Force has been created and Oil Spill Containment classes have been held, training local Fire Station crews in the event of similar incident. In October 2009, the Department was dispatched to assist with the containment of the Dubai Star oil spill and stood ready to deploy its oil containment booms.

#### **Educate at Public Events & Trainings**

Department members can encourage recycling and composting, use of alternative transportation, efficient energy and water use practices, and other conservation measures during publicly held training classes and presentations. These include:

- Neighborhood Emergency Response Team (NERT) Training, which teaches personal preparedness for emergencies, disasters and prevention.
- SF Firefighters in Safety Education (SFFISE), which provides fire safety and outreach to children in SF schools.
- School Visits, where Engine and Truck Companies visit SF elementary schools.
- Fire Station Visits, where school and youth groups tour Fire Stations.
- Community Related appearances and similar events.

In adult training situations, instructors can make introductory class announcements to remind participants of recycling bin locations and to encourage carpooling or taking public transportation to the next training sessions. At elementary schools, volunteers and on-duty crews can incorporate recycling and conservation reminders into their presentations. Visitors to Fire Stations will see the recycling stations set up throughout the Station, and members can point out the Department's conservation measures to visitors. SF Department of Environment may assist in providing educational materials and/or presentation methods appropriate for the presentation and training audience.

#### **Educate at Public Meetings**

Fire Commissioners and Department members can promote conservation measure standards at Fire Commission meetings. A brief statement describing the Department's commitment to reducing carbon emissions, recycling and energy and water conservation can be added to the meeting agendas, which are posted on the Fire Commission website and bulletin boards, and are made available at each Commission meeting. The reading of a standard housekeeping announcement can be added to the Fire Commission's Rules of Order, for example, announcing location of recycling and composting bins.

#### Protect Endangered Species on Twin Peaks: Mission Blue Butterfly

Twin Peaks is home to the endangered Mission Blue Butterfly. The area on the northeastern slope of Twin Peaks, which is under the jurisdiction of the Fire Department, has been one of the sites identified as prime habitat for Silver Lupine, critical host plant to the Mission Blue. Preserving the Silver Lupine habitat is key to the survival of the Mission Blue Butterfly.

The Department has transferred stewardship of the portion of its Twin Peaks property to SF Recreation and Parks Department so it will be managed in a manner consistent with San Francisco's Natural Areas Program. Habitat restoration efforts include eradication of exotic species, introduction of Silver Lupine plants, and protection of breeding and restoration areas from humans and their dogs. However, the Fire Department still retains access to this area for emergency operations.

Adjacent to the property being restored, signs have been posted to inform and educate the public of the restoration efforts taking place, and identify the City departments and community organizations involved.

#### Landscape with Climate-Appropriate Species as Water Conservation Measure

The Department includes the planting of climate-appropriate species as part of its water conservation Best Practices. A sign in public view announcing the Department's effort to conserve water could accompany any such landscaping, thus encouraging the public to join in water conservation efforts.

#### Assist in Habitat & Historic Trail Stewardship with Non-Profit: Sutro Stewards

The Department recognizes the value in preserving our City's natural areas. The Department's Twin Peaks property, which lies between Twin Peaks and Mount Sutro, provides a continuous urban green belt. The historic trail that winds through Mount Sutro Forest can be linked to the open space area on Twin Peaks. The local non-profit organization, Sutro Stewards, is interested in doing the required trail restoration work to create a continuous trail through the open space areas. Sutro Stewards, working with the Fire Department, aims to improve that portion of the trail, to provide a recreational open space for all to enjoy, while conserving the natural habitat.

Prior to beginning the trail restoration, the Department and the City need to assure the safety of those providing the volunteer labor and of the visitors using the trail and traversing the property.

#### **Promote Urban Agriculture**

Growing food locally by establishing urban gardens reduces the greenhouse gases caused by transporting food from remote agricultural locations.

As part of the Healthy and Sustainable Food for San Francisco Directive, the Department has participated in a land audit conducted to identify potential Cityowned plots of land that could be used to grow food. Several plots have been identified, including under-managed areas that could be better served as community gardens rather than the potential of becoming blight. The Department will continue to explore more stable long-term solutions for the management for these identified areas, consistent with City-established policies.

The Department's efforts, with the help of other City and non-profit agencies, can provide neighbors and community groups with the exposure of opportunities to help reduce our overall environmental impact.

## Appendices

- Appendix A Water Conservation Assessment Report
- Appendix B Buy Green Scorecard 2010

### 1.1 Water Conservation Assessment Summary

San Francisco Fire Department 698 Second St. San Francisco, CA 94107

In response to Executive Directive 08-05, requiring all municipal water accounts to participate in water use reduction, a water conservation assessment of the San Francisco Fire Department (SFFD) was performed. The following report provides a comprehensive list of water conservation measures and opportunities, savings potential, costs, and return on investment (ROI). All of the results of the analysis are presented in this report. Ranked by costs savings and cost effectiveness, the water saving recommendations are to:

- 1. Replace all lavatory faucet aerators with 0.5 gallons per minute (gpm) aerators.
- 2. Replace all showerheads with 1.5 gpm showerheads.
- 3. Replace all 1.0 and 2.0 gallon per flush (gpf) urinals with high efficiency urinals.
- 4. Install high-efficiency laundry machines.
- 5. Replace all 3.5 gpf toilets with 1.28 gpf high efficiency toilets.

In 2008, the SFFD used 16,100 hundred cubic feet (CCF) of water at their fire stations, arson unit and Headquarters, for a total cost of \$186,000. Implementation of the measures recommended in this report will reduce the annual water use of the buildings by about 6,030 CCF (4.5 million gallons), or 37%. The corresponding water and wastewater cost savings realized would be approximately \$70,400 per year at 2008 rates. Table 1 provides a summary of estimated water savings and a cost overview for the SFFD.

#### Table 1. Overall Savings Projections

Water Savings	
Estimated Annual Water Savings (CCF)	6,030
Estimated Annual Site Water Cost Savings	\$17,800
Estimated Annual Site Wastewater Cost Savings	\$52,600
Estimated Annual Site Total Cost Savings	\$70,400

Cost Overview	:
Estimated Total Installed Cost to Site	\$287,700
Estimated Potential Incentive	\$91,400
Estimated Net Installed Cost to Site	\$196,300
Estimated Payback	2.8 years

The San Francisco Public Utilities Commission (SFPUC) recently passed five years of water and wastewater service rate increases that will begin July 1, of 2009, 2010, 2011, 2012, and 2013. Under the approved rate increases, the average non-residential customer's combined water and sewer charges will increase an average of 5% each year through 2013. As a result, the cost savings realized through implementation of measures in this report will increase. Figure 1 below shows the projected water, wastewater, and combined cost savings from the current utility rates to 2013 rates.



#### Figure 1. Five-Year Savings Projections

Table 2 below summarizes our recommendations for improving water use efficiency at this facility. This analysis includes the costs associated with implementing each water efficiency measure, total annual water savings, and the estimated annual financial savings resulting from improved efficiency in water and wastewater use. The "payback" is the number of years it will take for the cost savings to pay for the cost of implementing the measure. Payback calculations do not account for inflation, equipment life, or operation and maintenance costs.

CI c !2 t: CII 0:::	Recommended Measures	 Net Installed Cost <sup>1</sup>	Projected Water Savings (CCF/yr)	Projected Water Savings (gal/yr)	Projected Water Cost Savings .•• (\$/yr)	Projected Wastewater Cost Savings (\$/yr)	Projected Total Cost Savings (\$/yr)	Payback (yr)
1	Install 0.5 gpm aerators on sink faucets	\$2,000	750	557,400	\$2,175	\$6,435	\$8,610	Immediate
2	Install 1.5 gpm fixtures on showerheads	\$1,100	2,500	1,893,000	\$7,401	\$21,899	\$29,300	Immediate
3	Replace all urinals with 1/8 gpf units	\$79,000	1,100	847,900	\$3,309	\$9,791	\$13,100	6.0
4	Install high-efficiency laundry machines	\$40,000	<b>.</b> 697	521,200	\$2,033	\$6,017	\$8,050	5.0
5	Replace all 3.5 and 5.0 gpf toilets with 1.28 gpf units	\$74,200	979	732,200	\$2,854	\$8,446	\$11,300	6.6
Tota	als	\$196.300	6.026	4 551 700	\$17 773	\$52 587	\$70.360	28
1	$\frac{1}{1}$ Includes materials labor rebates: SEPLIC rebates for toilets and urinals are subject to change				2.0			
2	<sup>2</sup> Based on blended water & wastewater rate of \$11 56/CCF for standard service with a 90% diversion factor			r				

Table 2. Recommended Measures and Saving	<u>s Pro</u>	<u>iections</u>
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Who in your dept, will be the Buy Green Leader?\* This person needs to have enough clout to motivate all staff in your dept. to:

- " Buy less, or buy green from SFApproved.org ., Attend the 1-1.5 hr Buy Green Ordinance Consultation. " Help your team meet the 4 Scorecard Criteria.

First Name	Gary
Last Name	Altenberg
Title	Lt.
Email	
Phone	

1. Did your Buy Green Leader join our email list?

You'll only get emails you want. It's the only way we can tell you:

- .. If you won the Buy Green Team of Year Award & basket of green products.
- " About new products, events, meetings to add green products your want to citywide contracts.

YES, so we'll get 0.05 POINTS

2A. Tell us how your department reminded all staff\*:

"It's the law for City staff to check <u>SFApproved.org</u> & buy <u>REQUIRED green products</u> & avoid <u>LJIV/ITED USE</u> & <u>PROHIBITED products</u> (per <u>SF Precautionary Purchasing Ordinance</u>). Win prizes for doing the right thing. Save money by buying less & buying green."

Each box you check & file you upload with the sentence above gets you  $0.1\,$  POINTS. For the first two choice below (i & ii), model our ourchasin forms & software after this samole. That way, if your purchasing staff are out o the o-1ce, anot er sta will now how to do the right thing.

i. Purchasing FORMS reminds staff it's the law to shop at SFApproved.org (e.g., Purchase Order, Requisition, Materials Request, Payment, Encumbrance)

ii. Purchasing SOFTWARE reminds staff it's the law to shop at SFApproved.org (e.g., ADPICS, RAS, Maximo). UPLOAD SCREENSHOTS.

iii. STAFF MANUAL or POLICY reminds staff it's the law to shop at SFApproved.org

iv. Photos of SIGNED Pledges to Buy Green are by our phones, computers, bulletin board, kitchen, copier. Order at SFApproved.org/citystaff#StickyNotePiedges

- v. Internal meeting agenda & attendance (excluding consultation with SF Dept. of Environment)
- vi. Dept. newsletter, email, website, Intranet, etc.

vii. Contract for janitorial OR pest control services includes language from SFApproved.orgiCieaning-ProductsI OR SFApproved.orgiPest-Control-for-City

vii. Other; OR how we remind staff that DO NOT HAVE EMAIL. Fill this out: \* I periodically review what's being purchased.

28. Scan all files you checked in 2A above & <u>upload it as one file</u> (only save as: .doc, .xis, .pdf, .jpeg on a PC not Mac).

Requisition Master- general. pdf (File size: 9746 bytes)

SF Dept. of Environment can only give you points for boxes you checked for 2A if you email one file with all the following to jessian.choy@sfgov.org by 2/28/11. After one week, click <u>tinvurl.comlbuy-green-score</u> to see if we updated your score & to get the link to print Scorecard

i. UPLOAD TO #2B FORMS that remind staff it's the law to shop at SFApproved.org, such as Purchase Order, Requisition, Materials Request, Payment, Encumbrance Forms

ii. UPLOAD TO #2B SCREENSHOTS of purchasing SOF1WARE reminds staff it's the law to shop at SFApproved.org (e.g., ADPICS, RAS, Maximo).

iii. UPLOAD TO #2B PHOTOS of how your Buy Green Pledges (sticky notes) are by phones, computers, & heavily trafficked areas (bulletin board, kitchen, copier)

iv. UPLOAD TO #2B STAFF MANUALS, GUIDES or POLICY on how staff should buy products  $\it I$  services reminds staff it's the law to check SFApproved.org

v. UPLOAD TO #2B AGENDAS & ATIENDEES of internal meetings (excluding consultation with SF Dept. of Environment)

vi. UPLOAD TO #2B Dept. NEWSLETIER, WEBISTE, INTRANET, etc.

vii. UPLOAD TO #2B what you described in #2A as Other

Detailed instructions:

3. Did your dept get a consultation for 2010?\*

This fun consultation (1 hour) with Jessian Choy, SF Dept. of Environment:

" Must be attended annually by everyone that orders, approves, audits products or services.

• Is a way for you to share solutions for your dept. & City to buy green, use safer pest control, recycle taxies. , Includes prizes.

Your dept. needs this consultation even if they attended trainings for: Recycling & Composting, Delegated Purchasers, Recycling Coordinators.

To meet this requirement for 2010, a consultation must take place between 1/1/2010-4/15/2011.

YES, our dept. SCHEDULED A CONSULTATION between 1/1/10-4/15/11, so we'll get up to 0.2 POINTS

Date of first consultation this year\*

#### 03114/2011

4. Did your dept. buy 75+% of REQUIRED green lighting or janitorial cleaners & papers, according to the City's Annual Report of City Staff That Bought Green or Prohibited Products?
\*
Check only 2 boxes below.

YES, we bought 75% green JANITORIAL cleaners / papers so we get 0.3 POINTS

 $\it NIA,$  we don't buy JANITORIAL cleaners  $\it I\cdot$  papers OR another Dept. or contractor buys it for us. (We won't get penalized. We'll still get 0.3 POINTS)

*NIA*, we buy JANITORIAL cleaners / papers BUT we were not in the REPORT (We won't get penalized. We'll still get 0.3 POINTS)

NO, we bought less than 75% green JANITORIAL cleaners / papers

YES, we bought 75% green LIGHTING ballasts so we get 0.3 POINTS

*NIA*, we don't buy LIGHTING, OR another Dept. or contractor buys it for us. (We won't get penalized. We'll still get 0.3 POINTS)

 $\it NIA,$  we buy LIGHTING BUT we were not in the REPORT (We won't get penalized. We'll still get 0.3 POINTS)

NO, we bought less than 75% green LIGHTING ballasts

I'll ensure at least 2 of these groups attend the Buy Green Consultation. You'll get 0.05 POINTS for each group that ATTENDS.

Who will host this consultation (ensure invitees attend, setup room & schedule)\* Who is influential, respected by & your staff, AND will warmly introduce SFE at the start of the consultation on how excited your dept. is to try to win the Team of Year Award\* STAFF & CONTRACTORS that request, order, approve, or audit any of the PRODUCTS or SERVICES in the QUESTION ABOVE  $\ast$ 

Worker Health & Safety Staff\*

Storeroom Managers, Purchasers, Finance Directors

Staff that are most excited to be green \*

Facilities or pest control staff\*

Staff that use (therefore should recycle) these products: aerosols, automotive products, batteries, cleaners, electronics, lighting, mercury thermometers, paints, pesticides, solvents \*

Staff that may have ideas to get the City to buy green \*

Staff that can add this to your purchase order forms or software (e.g., Maximo, RAS): "It's the law for City staff to check SFApproved.org & buy REQUIRED green products & services (SF Precautionary Purchasing Ordinance)".

OTHER

Did you invite your dept. staff that bought green or prohibited products? \*

Click to give us their contact info so we can oive them prizes or get their ideas on how to get the City to buy green from  $\underline{SFApproved. org^*}$ 

YES, I entered their contact info AND date they'll attend, so we'll get 0.1 POINTS

Number of people above you'll invite to the consultation (so we can bring enough prizes).\*

|--|

How often does your dept. buy green from  $\underline{SFApproved.org?}$  \*Tell us why so we can tailor the consultation to your needs.

ALWAYS- even when it's inconvenient SOMETIMES because they are interested in saving money RARELY NEVER

What would motivate your dept. to buy green from SFApproved.org?

Knowing we'll save money.

Vendors that sell to the City should be required to have online catalogs that sell green products not PROHIBITED products.

Contest of which dept. buys the highest% of SFApproved.org green products. Prize: green products or Buy Green Team of Year Award.

The List of City Staff That Bought Green or Prohibited Products (tinyurl.com/who-bought-green)

Negative consequences take place when staff buy LIMITED USE & PROHIBITED products.

Learning the science of how green products are added to SFApproved.org

Trying green products or hearing true stories of people that like them.

Knowing it's the law to shop at SFApproved.org

City purchasing system (ADPICS) allows City staff to buy green products not PROHIBITED products. OTHER

Your team got a VERY GOOD score of 1.3 (out of 2 possible points). Since you got a score of 1 or higher, you're in compliance. Thank you for being a leader & model for other depts.!

If you want the option to increase your chance to win high-value oreen products of your choice & the Buy Green Team of Year Award. just ciick these tabs at top to see how you can get more points:

" Criteria 1-4

" Get a Consultation (invite more groups to attend)

Thank you for your hard world Still have questions? Jessian Choy looks forward to help you get more points (Jessian.Choy@sfgov.org, 415-355 -3776).