



# FY 2010 - 2011 Departmental Climate Action Plan

April 2012

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## 1. Introduction

The SFMTA is ahead of schedule in meeting Departmental 2012 greenhouse gas reduction targets. Each City Department is required to reduce 1990 emissions 20 percent by 2012 per direction by the Board of Supervisors. The SFMTA reduced 1990 greenhouse gas emissions by 31 percent as of the end of June 2011.

This success has been accomplished through purchasing fuel saving hybrid buses and using biodiesel, through facility greening – including the addition of a living roof on SFMTA's Headquarters Building, with award-winning recycling program staff, green purchasing commitments, and by running the cleanest multi-modal transit fleet in California. This FY2010-2011 Departmental Climate Action Plan (DepCAP) report provides concise status update of all of this work, while previous Agency DepCAP reports contain lengthier and in depth discussions and summaries for these programs and policies. This year's DepCAP builds upon and updates previous report foundations.

While much progress as has been made, there's of course more work to do. The SFMTA has been working hard to take emissions reduction work to even greater levels during the FY11-12 reporting period, through the remainder of 2012, and beyond by ensuring that energy reduction and other greening initiatives are baseline criteria in all SFMTA activities.

In addition to the Agency's direct carbon footprint (fuel and energy used by the SFMTA), the SFMTA is also focused more than ever on addressing greenhouse gas emissions produced by all other vehicle modes in San Francisco's transportation sector (all transportation sources, including cars and trucks). For more details on this work, see Section 5, Communitywide Impact.

## 2. Departmental Profile

Departmental Mission: The San Francisco Municipal Transportation Agency (SFMTA) is responsible for all modes of transportation within the City and County of San Francisco including public transit, bicycling, pedestrian planning and accessibility, taxi and traffic and parking management.

Departmental Budget: The SFMTA had an operating budget of \$775.0 million in FY10-11, and a 5-year Capital Improvement Program totaling \$3.0 billion (heavily weighted by Central Subway).

Number of Employees: SFMTA currently has 5,020 employees. The majority (73 percent) of SFMTA's employees are in Transit Service Delivery (operations and maintenance). The next largest divisions are Security (including fare inspectors and Parking Control Officers) and Sustainable Streets.

Facilities: The SFMTA headquarters building is located at the corner of Market Street and Van Ness Avenue (One South Van Ness Avenue) in San Francisco. However, most SFMTA employees are located at the SFMTA's 26 other addresses all over the City, including many locations supporting multiple groups at one address. Operations and Maintenance groups at one location are typical, while one SFMTA location (700 Pennsylvania Ave) houses almost a dozen different groups, from carpenters to elevator/escalator staff.

Most SFMTA facilities are transit vehicle operating locations. Five different transit vehicle modes operate out of nine different locations around the City. In most cases these locations are active around the clock, every day of the year. The number of employees at these vehicle locations range from 200 to over 500, although not all are present at the same time, due to evening and all-night transit service support.

See Section 3a, Facilities, for a complete list of SFMTA locations.

Vehicles: SFMTA's 3,386 fleet vehicles include five transit modes (motor coaches, trolley coaches, light rail, historic streetcars, and cable cars), parking control vehicles, maintenance support vehicles, paratransit vans, and taxis (regulated). 59 percent of the transit fleet is zero emission, and 72 percent of the taxi fleet is a hybrid or CNG vehicle.

See Section 3b, Fleet, discussion for a complete list of SFMTA vehicles.

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Other SFMTA Sustainability and Environmental Plans:

2011 Climate Action Strategy (CAS)

- The Climate Action Strategy is a voter mandated deliverable of Proposition A (2007) requiring the SFMTA to address emissions reduction in the City's transportation sector (all land-based mobile sources)
- CAS report is required every two years (2009, 2011, etc.)
- SFMTA Transit vehicles contribute 1% to overall greenhouse gas emissions in San Francisco (other regional transit operating in the City contributes and additional 2%). Private vehicles contribute over 32%
- The SFMTA is the City Department in the best position to address transportation sector emissions through its management of transit, taxis, parking, traffic, streets, and bicycle programs
- Complete Streets Strategy; includes bicycle network improvements
- See Section 5 of this report, Communitywide Impact, for more details

APTA Sustainability Commitment – Gold Level

- American Public Transportation Association program for transit agencies and related private companies
- Ranking system similar to LEED (i.e. Platinum, Gold, Silver, Bronze)
- Based around ISO-14001 operations standards and practices
- SFMTA one of just a few transit agencies in U.S. to apply for Gold level
- Annual update reports to APTA are required following certification

SFMTA and SF Environment Clean Air Plan – Zero Emissions 2020

- Adopted by mayor and Board of Supervisors in 2004
- Transition strategy for moving to a 100% zero emission fleet
- 59% of SFMTA's transit fleet vehicles are zero emission in 2012
- 38% of SFMTA's 819 buses are zero emission in 2012
- "Bridge" technologies between conventional buses and wireless zero emission buses (no overhead wires) include series-hybrid buses and the use of biodiesel
- Particulate matter (PM) emissions have been reduced 99% since 2000 through fleet turnover and installation of exhaust filters on all buses
- Hybrid bus fleet is realizing 25-28% higher MPG than non-hybrids (saving more than 200,000 gallons per year)
- This strategy allows the SFMTA to continue to provide the lowest per-passenger emissions of any multi-modal transit agency in California without a significant increase in operating cost and without facility modifications

**3. Departmental Carbon Footprint and Historical Analysis**

To date the SFMTA carbon footprint from 1990 has been reduced by 31 percent, from 67,663 to 44,321 metric tons CO<sub>2</sub>e. Note that this baseline comparison does not include 1990 Muni facility natural gas use, Muni non-revenue vehicle fleet fuel use, or the Department of Parking and Traffic – all a part of today's SFMTA. The 31 percent reduction is an 'apples to apples' comparison of 1990 transit fleet fuel and electricity use with the same sources from FY10-11. Agency footprint totals since 2005 have included all of the current sources under the SFMTA – at this time direct year-to-year comparisons of total Agency CO<sub>2</sub>e only go back to 2005.

**3a. Facilities and Reduction Measures**

✓ *Facilities Verification:*

The list of facilities that is being used by SF Environment to calculate the departmental carbon footprint has been verified by SFMTA staff.

✓ *3a1. Energy: Electricity and Natural Gas*

Emissions Source:	Consumption:	CO <sub>2</sub> e (metric tons):
Electricity (kWh)	123,746,104.48	1,827.12
Natural gas (Therms)	579,043.39	3,080.28

✓ *Green Building and Energy Efficiency Retrofit Projects:*

The following SFMTA energy efficiency retrofit projects are either still in construction, or else the measurable energy savings are in the form of community carbon avoidance.

LEED and Green Building Projects (all yet to be certified by USGBC):

SFMTA Location:	LEED qualification:	Highlights and Challenges:
Central Subway	Maximum points will be pursued; difficult to certify	Opportunities exist outside of LEED for greening infrastructure and track ways
Islais Creek Bus Division	New Construction (NC) Silver	Designed to accommodate fueling

	anticipated	and maintenance of alternative fuel vehicles; 50,000 sq. feet
Central Control/Operations Center	Interior Design Certification (IDC) Silver anticipated	BART owned; 41,000 sq. feet

Electric Vehicle Charging Stations in SFMTA Public Parking Garages:

Garage:	Number of Chargers:	Usage Comments:
Civic Center	4 modern + 3 older type	4 chargers used daily for City vehicles
Fifth & Mission	4	
Ellis – O’Farrell	2	
Golden Gateway	2	Used daily for 8 hrs/day
Japan Center	2	Inductive charger used 1/month; conductive charger not used
Lombard	2	
Moscone Center	2	Rare use
Performing Arts	2	
Portsmouth	2	Used 3-4 times/yr.
St. Mary’s Square	2	Used 3-4 times/yr.
SFGH	2	1 charger used daily
Sutter-Stockton	2	Two charger types; used 24 hrs/month average
Total:	31	

SFMTA Staff Electric Charging Station: The maintenance facility at 700 Pennsylvania has a high-voltage electrical outlet circuited and dedicated for plug-in electric vehicles.

- ✓ *SFPUC’s Energy Performance Benchmarking Tool:* Completed. The SFMTA worked closely with the SFPUC to verify facility lists, confirm addresses, year built, square footage, number of staff, number of computers, operating hours, and other specific information requested.
- ✓ *See Appendix A for the City’s Lighting Efficiency Ordinance – Summary and Waiver.*

✓ See Appendix B for 2008-11 San Francisco Municipal Green Building Report

✓ Renewable Energy Generation:

As part of the implementation of the Citywide Clean Energy Clean Air Program, the SFPUC is working on two solar projects located at SFMTA facilities. Additionally, the SFMTA is implementing solar power transit shelters:			
SFMTA Location:	Power Generated:	Construction Status:	Notes:
Woods Bus Division 1095 Indiana St.	100 kWh solar rooftop panels; 130,728 kWh/yr.	Completed	
Maintenance of Ways 700 Pennsylvania	127 kWh solar rooftop panels; 159,639 kWh/yr.	2012 installation pending	Approval of bid process has delayed project
Transit Shelters	147 kWh/yr. solar rooftop panels per shelter	2 solar shelters installed to date (Geary-Arguello and Halladie Plaza)	More installations anticipated pending verification that power generated is greater than shelter power draw

Solar transit shelter challenges:

- 1) Some transit stop locations do not receive direct sun
- 2) PG&E's downtown network does not allow grid-tied solar
- 3) Shelters connected to street lighting circuits and buildings for power cannot accept grid-tied solar for life-safety reasons

**3a2. Water Use**

✓ FY10-11 Water Consumption: 21,301,010.96 gallons

**3b. Fleet and Fuel Reduction Measures**

✓ Fleet Verification:

It is recommended that the SF Environment-managed Google Docs summary for this area be expanded to include a separate accounting (additional

sheets/pages) for transit vehicles, taxis, paratransit vans, and parking control vehicles, in addition to the existing list of the SFMTA's non-revenue fleet. Fifty percent of SFMTA's 3,386 vehicles are alternative fuel or zero emission vehicles.

✓ 3b1.Fuels

Fuel:	Consumption (Gals):	CO2e (metric tons):
Biodiesel blends (Gals)	4,373,871.66	44,320.89
Gasoline (Gals)	265,143.20	2,335.28
CNG (GGE)	6,454.23	39.40
LPG (Gals)	5,547.90	32.11
<b>Total:</b>	<b>4,651,016.99</b>	<b>46,727.68</b>

Fuel analysis challenges:

- 1) "Up stream" (production and product transportation) emissions are not factored into liquid fuel as with electricity.
- 2) Baseline year comparisons. SFMTA baseline emission totals from 1990 (through 2001) are exclusively Municipal Railway (Muni) in SF Environment's Google Docs and previous accountings. In 2002 the Department of Parking and Traffic merged with Muni to form the SFMTA, adding about 500 vehicles to Muni's roughly 1,500 vehicle fleet at that time, which is what SFMTA's DepCAP carbon footprint currently represents. Direct comparisons between years should include a careful accounting of which vehicles and facilities are being compared.
- 3) The taxi fleet (1,480 vehicles regulated by the SFMTA) is not accounted for in the DepCAP carbon footprint for the SFMTA. These vehicles are operated by private contractors and fuel at public locations, they are therefore not included in municipal fuel use records as with all other vehicles in SFMTA's fleet. Under SFMTA management, 72 percent of the taxi fleet has been converted to hybrid and CNG, a great success, which is why they are detailed as part of the DepCAP Fleet discussion. Note that the emissions contribution from the taxi fleet is being accounted for through modeling and analysis of the Citywide transportation sector and related CAS work.

### 3b2. Fleet

✓ See Appendix C for Healthy Air and Clean Transportation Plan for FY2011-12

✓ Biodiesel program:

The following are biodiesel blend percentages and subsequent reductions in the SFMTA's 1990 carbon footprint total and the City's 2012 municipal total:

- 2012 SFMTA GHG requirement = 20% reduction
- Resuming B20 average = 35% reduction in SFMTA GHGs
- B50 average = 10% reduction in municipal GHGs

Biodiesel program challenge: In September 2009 SFMTA was forced to reduce biodiesel blend percentages for more than half of the bus fleet due to SFDPH concerns regarding underground biodiesel storage compliance. Average bus fleet biodiesel blend dropped from B20 in 2007 to a B11 average in FY 2010-2011. The Agency is currently in the process of funding and retrofitting facility storage tanks in order to increase biodiesel blend levels with SFDPH approval.

### 3c. Historical Analysis

Greenhouse gas reduction strategy: The SFMTA's carbon footprint is made up of two primary sources: electricity and diesel fuel. Electricity to the SFMTA is zero emission Hetch Hetchy hydroelectric by City charter. Therefore the Agency's carbon footprint from electricity is minimal, making up just 5 percent, and this is from non-Hetch Hetchy sources used for facility power. The remaining Agency carbon footprint is from the use of diesel fuel in transit buses. Biodiesel is biogenic and is not included in carbon accounting. Since the bus fleet carbon footprint is calculated based on diesel fuel only – and not biodiesel - the SFMTA's clear short term strategy for reducing the total Agency carbon footprint is displacing conventional diesel fuel with locally collected and produced biodiesel. The SFMTA began the implementation of biodiesel by fueling all 600 Agency diesel vehicles with B20 in December 2007. Short term results: Unfortunately, due to biodiesel storage concerns, the SFDPH formally recognized and specified in 2009 that B20 could only be securely stored at one of the SFMTA's three bus divisions, Woods. The other two divisions, Kirkland and Flynn, were limited to less than B1 due to their less substantial underground storage tanks and SFDPH's concerns with potential underground fuel leaks caused by biodiesel compromising older storage tank

materials. In 2010 the SFDPH revised their regulatory interpretation and allowed a biodiesel blend of B5 to be stored and used at Kirkland and Flynn. The consequence of these fuel storage limitations over the past three years is that the Agency's biodiesel blend average is B12 for all fuel used during that time. However, despite this reduction in biodiesel blend level, the SFMTA's carbon footprint from fuel has barely changed. This seems contradictory, since biodiesel blend levels are inversely proportional to the Agency's fuel carbon footprint size.

Interpreting the results: The other way to reduce diesel fuel use is to increase the bus fleet's average fuel economy. During the past three years, overall fuel use has decreased as a result of replacing older buses with hybrid buses, and from retrofitting older-engine buses with modern, more efficient engines. Hybrid buses achieve 26-28% higher fuel economy relative to conventional diesel buses.

So what we are seeing in the relatively flat three year carbon footprint data for the SFMTA is a result of bus technology improvements overcoming biodiesel blend level reductions. In other words, the use of diesel fuel has remained steady, initially as a result of displacing 20 percent of it with biodiesel, and later as a result of operating more hybrid buses that use less fuel.

#### 4. Other Sustainable Practices

This section includes Zero Waste, Employee Commute, Green Purchasing, Information Technology, and Urban Forest efforts.

##### 4a. Zero Waste

- ✓ See Appendix D for Waste Assessment Questionnaires.
- ✓ The table below lists waste reduction commitments for the subsequent year by location:

Facility or Group name:	Address:	Commitment:
Woods Bus Division	1095 Indiana St	These facilities are in the City's top 20 for waste production. Recycling coordinators have been nominated for each location to help optimize the programs by ensuring that trash compactors are appropriately sized, well-marked and properly placed.
Kirkland Bus Division	2300 Stockton St	
Flynn Bus Division	1940 Harrison St	
Presidio Bus Division	949 Presidio	
Green Light Rail	2200 San Jose Ave	
Maintenance of Way	700 Pennsylvania Ave	New hire training

##### 4b. Transportation Options

- ✓ *Outreach efforts:*  
 The SFMTA co-hosted an outreach event with SF Environment for the Agency's Sustainable Streets Division's quarterly staff meeting on February 14, 2012. Additional internal outreach efforts are being planned for May 2012.
- ✓ *Avenues used to distribute commuter and work travel information:*
  - Brown bag lunch presentations
  - Commuter Program e-mail outreach to employees(see Appendix E)

- Commuter Program information attached to paychecks
- New employee orientation

✓ *Number of employees enrolled in pre-tax Commuter Benefits program:*  
206 SFMTA staff were enrolled in the City's Commuter Benefits Program at the end of FY2010-2011.

✓ *Local and regional commuter campaigns:*

- The SFMTA presented as part of the BART Blue Sky event.
- 27 staff participated in MTC's Great Race for Clean Air

✓ *Transit First Plan:*

SFMTA incentives and programs:

- Employee ID cards can be used to ride Muni at no cost; Operators' families ride Muni free. Employees can participate in compressed work week, flex time, and telecommuting
- One South Van Ness Avenue has a bicycle parking room and a fleet of five bicycles for employee field work. There were two bicycle fleet information requests from SFMTA staff recorded in FY2010-2011, bringing the total number of request to 27

Car/truck/van pool vehicle use reduction:

- Further investigate the feasibility of adjusting facility pool car fleets and sign up (reservation) techniques
- Provide more frequent and extensive employee education regarding driving and commute alternatives
- Investigate the use of taxi vouchers and car share membership for employees with assigned "personal" cars
- Based on annual Transportation Survey results, investigate the potential to coordinate employee commute shuttles from central, regional parking locations and SFMTA facilities
- Potentially revise employee vehicle and transportation policies related to work errands (including physicals) that do not allow transportation alternatives like bicycles

#### 4c. Green Purchasing

✓ *SFMTA's Buy Green scorecard is attached as Appendix E to this report*

#### 4d. Information Technology

- ✓ *All PCs and monitors labeled with "energy conservation reminder – turn off when not in use", and All PCs automatically go into hibernation or standby mode after 20 minutes of inactivity:*

The SFMTA has not started these initiatives. Energy savings including “phantom loads” (energy used even when in hibernation mode) are a concern and this is the primary area of focus for IT greening.

- ✓ *Obsolete servers have been replaced or consolidated with new EPEAT Gold standard "blade servers":*

The SFMTA data center is a modern, low power-consumption facility. All IT equipment purchases meet EPEAT gold standards, and while the SFMTA is not using blade technology, the Agency continues to perform server consolidation to reduce the server footprint by 25 percent.

- ✓ *Challenges:*

SF Environment may be able to further assist with implementation and encourage user-adoption of this energy saving campaign through providing uniform and appropriate decals to all departments.

#### 4e. Carbon Sequestration / Urban Forest

Street greening programs: The SFMTA collaborates with the City Planning Department on Pavement to Parks Programs, and the SFMTA's Traffic Calming and Pedestrian Programs work to include tree planting and landscaping in projects where technically feasible, where there is community support, and when funding is available for installation and maintenance. The SFMTA partners with community groups, SFDPW, and the Bureau of Urban Forestry to ensure that appropriate tree and plant species are added. SFDPW and the community then sign an agreement to maintain the landscaping.

Tree and landscape maintenance: The SFMTA maintains street trees and landscaped areas adjacent to facilities and designated rights of way. The total number of trees in these areas is estimated to be up to 1,000. The SFMTA also maintains Urban Forest growth near transit lanes and overhead lines as necessary for safe transit operations (low hanging branches, etc).

Urban Forest locations: SFMTA tree and landscaped areas include the following:

- Transit Divisions: Flynn Bus Division; Green Light Rail Division (including historic streetcar yard); Kirkland Bus Division; Muni Metro East (MME) Light Rail Vehicle Division; Potrero Bus Division; Presidio Bus Division; Scott Center (non-revenue fleet); and Woods Bus Division
- Transit Locations: Cable car landscape areas; Carl & Cole area; Embarcadero Light Rail and F-Line right of way areas; Forest Hill station; Geneva-Munich area; Illinois sub-station; J-Line area; Keith sub-station; La Playa terminal  
Russia sub-station; West Portal station
- Other locations: 700 Pennsylvania Ave (Maintenance of Way) and 1580 Burke Avenue (Materials Management warehouse)

Urban forest challenges:

- 1) In terms of managing the trees and landscaping in and around transit locations, the areas of greatest need are for better irrigation of existing landscaping, and for more resources to plant and provide regular maintenance.
- 2) The need for additional maintenance resources is a particular concern where trees are planted close to transit lanes and overhead wires. Currently only SFDPW and Rec & Park have municipal landscape staff, with other related services (such as arborist work, as noted below) contracted out by all City Departments.

## 5. Communitywide Impact

As the organization responsible for pedestrian circulation, bicycling, parking, street management, taxis and the Muni transit system, the SFMTA is essential to reducing carbon emissions in San Francisco. While the SFMTA footprint detailed in this DepCAP report represents one percent to the City's overall carbon footprint, the Agency's work directly prevents much larger amounts of emissions in the community by attracting people to sustainable transportation modes. Approximately half of San Francisco's residents commute to work by transit, walking, carpooling or bicycling.

Climate Action Strategy: Focused on the community aspect of SFMTA's climate work, the SFMTA released the Agency's first Climate Action Strategy (CAS) in 2011. The 2011 CAS illustrates strategies for addressing the City's transportation sector emissions, detailing new research and conclusions from extensive planning model runs and an analysis of best practices from around the world. See page 4 of this report for additional details on this year's CAS.

## Appendices

- A: City's Lighting Efficiency Ordinance – Summary and Waiver
- B: San Francisco Municipal Green Building Report for SFMTA
- C: Healthy Air and Clean Transportation Plan for FY2011-12
- D: Waste Assessment Questionnaires
- E: Employee Commute sample email
- F: Buy Green Scorecard