Title: Departmental Climate Action Plan (DepCAP)
Data Year: Fiscal Year 2009-2010

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1. Introduction

The SFMTA's FY 2009-2010 Departmental Climate Action Plan (DepCAP) is an annual status report on SFMTA's efforts to reduce the Agency's greenhouse gas (GHG) emissions, significant activities taken over the past year, and immediate next steps to continue to progress towards meeting the City's emission reduction targets.

The SFMTA is ahead of schedule in meeting Departmental 2012 greenhouse gas reduction targets. Each City Department is required to reduce emissions 20 percent by 2012 compared to 1990 levels, per direction by the Board of Supervisors. The SFMTA reduced 1990 greenhouse gas emissions by 21 percent as of the end of June 2010.

This success has been accomplished through the following measures:

- Purchasing fuel saving hybrid buses and using biodiesel
- Facility greening – including the addition of a living roof on SFMTA's Headquarters Building
- Award-winning recycling program staff
- Green purchasing commitments
- Running the cleanest multi-modal transit fleet in California

This report provides details on all of this work and more.

While much progress as has been made, there is more work to do. The SFMTA has been working hard to take emissions reduction work to even greater levels during the FY10-11 reporting period, through the remainder of 2011, 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.

Proposition A (2007) requires the SFMTA to report on the following, starting in 2009 and every two years thereafter:

1. Zero greenhouse gas emissions for Municipal Railway transit vehicles;
2. Lowering energy consumption in Agency facilities and by non-transit vehicles;
3. Maximizing waste reduction in Agency operations;

4. Increasing transit trips and reducing private vehicle trips within the City;
5. Increasing the use of bicycling and walking as alternate forms of transportation; and
6. Improving regional transit connections to reduce private vehicle use by commuters.

This report addresses items 1-3 in the list above. The Transportation Sector Climate Action Strategy responds to items 4-6.

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 $768.6 million in FY09-10, and a 10-year capital need of $8.4 billon ($5 billion in the next five years, 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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- DepCAP: Sam Fielding, Nick Carr and Jerry Robbins
- Employee Commute: Carli Paine
- Facilities: Peter Gabancho
- Fleets: Virgil Dennis and Richard Fonseca
- Green Purchasing: Keith Carr and Luther Manning
- Information Technology: Travis Fox
- Real Estate: Kerstin Magary and Ken Yee

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 updates are required every two years (2009, 2011, etc.)
- SFMTA's 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, transit priority, and pedestrian safety improvements
- See Section 5 of this report, Communitywide Impact, for more details

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 2011
- 38% of SFMTA's 819 buses are zero emission in 2011
- "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

APTA Sustainability Commitment – Gold Level Application

- American Public Transportation Association (APTA) program for transit agencies and related private companies
- Ranking system similar to LEED (i.e. platinum, gold, silver, bronze)
- Annual update reports to APTA are required
- SFMTA one of just a few transit agencies in U.S. to apply for gold-level
- Base principles and gold-level pre-requisites have been met
- Gold-level commitments are complete or on schedule for completion within 3 years
- Certification anticipated by the end of 2011
- The following table is a summary of APTA's gold-level sustainability commitment:

APTA Sustainability Commitment Base Principles:

1. Sustainability is a part of the Agency's strategic objectives
2. Sustainability champions have been identified and given proper resources
3. Sustainability outreach program established
4. Sustainability inventory established (the following is the minimum APTA list of areas to be quantified):
   - Carbon emissions
   - Criteria air pollutants
   - Energy use
   - Operating expenses
   - Waste-recycling levels
   - Water usage
   - VMT per capita in service area

Image of American Public Transportation Association Sustainability Commitment logo.

Gold-level Pre-requisites:

Action item met:	Area:	Stretch goal met:
Establish in-house Green Teams	Operations	Comprehensive measuring and reporting on targets, progress made, and results achieved – made available to all stakeholders
Recycling program	Operations	Sustainable-procurement policy
Employee commute benefits	Operations	
Vehicle "no idling" policy	Operations	
Green Building – new and existing facilities	Operations	
Green roof and photovoltaics	Operations	
DBE contracting for all construction projects	Operations	
Transit/land use part of all project planning	Planning and Const.	LEED-like green principles for all new construction
Stakeholder engagement for all new projects	Planning and Const.	
All new offices/stations/facilities in	Planning and Const.	

Action item met:	Area:	Stretch goal met:
areas zoned for compact, mixed-use development		
In-house expertise and coordination of sustainability program	Outreach	
Sustainability is regular agenda item for staff meetings	Outreach	

Gold-level Pre-requisite reduction targets met (relative to 2005 baseline):

- 5% or greater reduction in Agency carbon footprint
- 5% or greater reduction in criteria vehicle emissions
- 5% or greater reduction in fuel use
- 2% or greater reduction in administrative energy use
- 2% or greater reduction in electricity use

Note: The 2-5 percent reduction targets, above, are required as a pre-requisite for gold-level. The gold-level commitment (action items and stretch goals detailed below) requires a 10% or greater reduction in all of these reduction target areas. The commitments also requires an additional 18 action items and 3 stretch goals (for a total of 36 action items and 6 stretch goals) – as listed in the following table:

Gold-level Commitments:

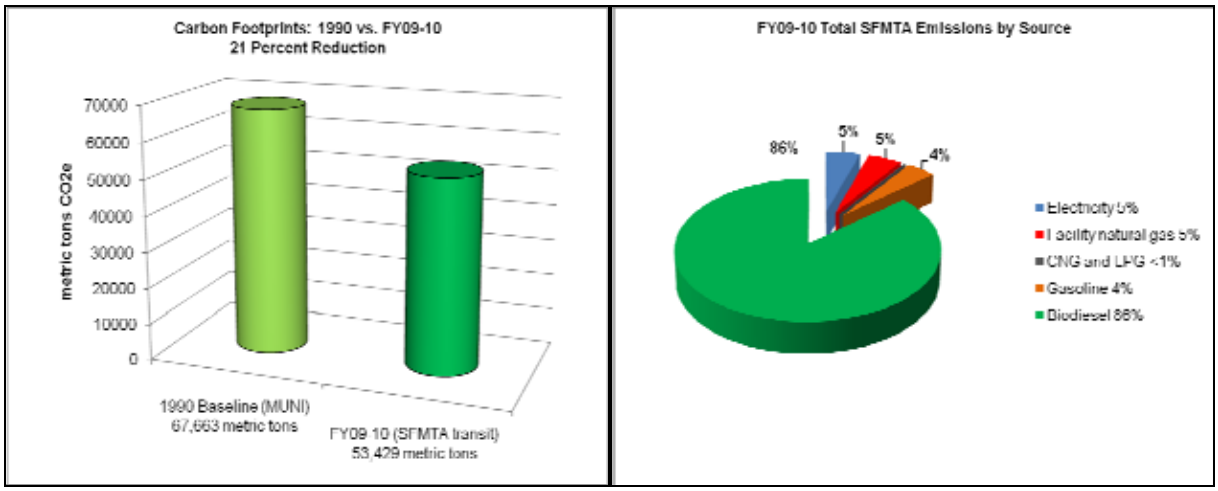
Action Item:	Area:	Stretch goal in next 3 years:
Establish ISO 14001 and similar efforts	Operations, Maintenance and Finance	3rd party verification of measurements/reductions
Invest training on Environmental Management Systems (EMS)	Operations, Maintenance and Finance	
Establish new energy efficiency targets for key products	Operations, Maintenance and Finance	
Improve sustainability performance of key products	Operations, Maintenance and Finance	
Green Purchasing	Operations, Maintenance and Finance	
Energy efficient appliance purchasing	Operations, Maintenance and Finance	

Action Item:	Area:	Stretch goal in next 3 years:
Work with vendors to establish more sustainable processes and products	Operations, Maintenance and Finance	
Reduce operating expenses	Operations, Maintenance and Finance	
Reduce water usage	Operations, Maintenance and Finance	
Reduce water pollution	Operations, Maintenance and Finance	
Reduce hazardous waste	Operations, Maintenance and Finance	
Reduce carbon footprint of meetings (less paper)	Operations, Maintenance and Finance	
Reduce VMT per capita in service area	Planning and Construction	Establish an Agency-wide climate action policy/plan that covers economic, social, and environmental sustainability
Help customers become more sustainable	Planning and Construction	Transit/land use policies developed with MTC
Expand programs for populations with few transportation options	Planning and Construction	
Sustainability criteria for all new projects	Planning and Construction	
Targets set for cost savings from recycling/energy efficiency measures in all new projects	Planning and Construction	
“Sustainable Proposals” bid/contract process (less paper)	Planning and Construction	

APTA’s Platinum-level Sustainability Commitment requires the following:

- Achieving 36 gold-level commitments and 6 stretch goals
- Meeting 20% reduction targets for 2005 baseline measurements
- Additional 3 stretch goals over 6 years:
    - Fully implement EMS and/or ISO 14001 standards
    - Re-define lifecycle costing to sustainability criteria
    - Become viewed as a sustainability leader in the community

3. Departmental Carbon Footprint



Carbon Footprints: 1990 vs. FY09-10
21 percent reduction
1990 Baseline (MUNI) 67,663 metric tons
FY09-10 (SFMTA transit) 53,429 metric tons

FY09-10 Total SFMTA Emissions by Source
Electricity 5%
Facility natural gas 5%
CNG and LPG <1%
Gasoline 4%
Biodiesel 86%

The SFMTA was created in 2002 by the merger of the former Municipal Railway and the Department of Parking and Traffic. The 1990 baseline only accounts for the Municipal Railway fleet and facilities, and does not account for the natural gas usage or the non-revenue vehicle fleet, neither of which are estimated to have had significant emissions levels.

Just looking at the inputs evaluated for the 1990 baseline, the SFMTA carbon footprint has been reduced by 21 percent from 67,663 metric tons of carbon dioxide equivalent (CO_2e) to 53,429 metric tons CO_2e. And, when looking at the total SFMTA carbon footprint of 58,639 metric tons, which incorporates the previously unaccounted for elements, the SFMTA still has achieved significant greenhouse gas emissions reductions.

To maintain current citywide reduction levels and make further progress in meeting the City's reduction targets, sustaining and expanding transit is necessary. However,

there are several challenges associated with expanding transit services in San Francisco. The current economic climate presents very limited funding. There is also an inverse relationship between successfully providing transit to more people and the greenhouse gases associated with transit; transit emissions may need to grow in the short term to provide the necessary service levels to accommodate the City's desired mode shift.

The SFMTA's achievements have been recognized nationally as a model transportation agency and will continue to strive for the greenest fleets feasible.

In FY09-10, Agency electricity usage was reduced slightly by about 800,000 kWh from the previous year, yet due to a higher mix of non hydroelectric power from SFPUC, electricity emissions increased SFMTA's carbon footprint by almost 3 percent in FY09-10. As SFPUC is able to provide cleaner electricity, and higher biodiesel blend storage is allowed by SFDPH, the SFMTA can immediately reduce the Agency's 1990 carbon footprint by 35-40 percent.

The total cost for SFMTA's energy use in FY09-10 increased by $246,334 over the previous year. More natural gas use drove facility energy costs up, while liquid fuel market price increases drove vehicle fuel cost higher. The cost to purchase energy versus the emissions produced favors electricity over gas and liquid fuels – even without factoring in "upstream" emissions from gas and liquid fuels. It should be noted that this same energy-cost ratio that allows San Francisco's existing electric vehicles and infrastructure to operate so inexpensively also works against funding calculations for new solar installations.

3a. Facilities – Energy & Water Use, & Reduction Measures

✓ FY09-10 Carbon Footprint for Electricity and Natural Gas:

Emissions Source:	Consumption:	CO2e (metric tons):	Cost:
Electricity (kWh)	129,536,376.48	2,764.22	$6,490,454.43
Natural gas (Therms)	517,713.08	2,754.03	$436,093.60
Total:	$1255 energy/ Metric ton CO2e	5,518.25	$6,926,548.03

These totals compare to the previous year, FY08-09, as follows:

- Electricity use decreased significantly (-812,000 kWh)
- Total facility energy consumption increased <1% due to more natural gas usage
- Facility energy costs increased by 1.5% (+$108,000)

Challenges: Total facility energy use did increase slightly in FY09-10, due to more natural gas use. However, note that while electricity consumption *decreased* significantly, conversely, the emissions produced by electricity *increased* by well over 500 percent in FY09-10 (+2,442 metric tons CO2e). This increase in emissions is due to SFPUC's emissions factor, applied to total electricity consumption to calculate CO2e. The emissions factor for electricity represents the footprint of the power source, and varies based on where the power comes from (i.e., the proportion of natural gas and other power plant electricity versus hydroelectric power used). The emissions from electricity are the only significant difference between this year's carbon footprint and SFMTA's FY08-09 carbon footprint. According to SFPUC, it is important to note that FY08-09 was a very good year for snowpack and water reserves in the Sierra, and therefore SFPUC's ability to supply such a favorable, hydroelectric weighted energy mix (emissions factor) for larger part of the year. In other words, more snowpack in the Sierra translates to lower annual emissions for our facilities and electric vehicles in San Francisco. Even this year's relatively larger emissions factor is still significantly lower than what it would be without San Francisco's Hetch Hetchy hydroelectric power contribution.

✓ 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.

SFMTA-owned Facilities:

Facility name:	Address:
Motive Power	2502 Alameda St.
Cable Car Barn – Operations and Maintenance	1201 Mason St.
Central Control – Operations and Technical	131 Lenox Way
Citations	11 South Van Ness
Discount ID Office	27 Van Ness
Duboce Station	30 Duboce Ave. (at Church St.)
Enforcement – PCO Dispatch	505 7th St.
Enforcement 2323 (trailer in SFDPW yard)	2323 Cesar Chavez St.
Enforcement 245	245 3rd St.
Enforcement 501	571 10th St.
Flynn Division (60' articulated MCs) – Operations and Maintenance	1940 Harrison St.
Green Light Rail Annex	425 Geneva Ave.
Green Light Rail Metro – Operations and Maintenance	2200 San Jose Ave.
Headquarters Building	One South Van Ness
Islais Creek	1301 Cesar Chavez St.
Kirkland Division (MCs) – Operations and Maintenance	2301 Stockton St.
Maintenance of Way – Building and Grounds; Carpentry Shop; Communications; Custodial; Elevator/Escalator; Infrastructure Maintenance; Materials Control; Signals; Special Machine Shop; Track	700 Pennsylvania
Marin Street	1399 Marin St.
Meter Shop – Machine Shop and Traffic Signals	901 Rankin St.
Overhead Lines	1401 Bryant St.
Paint Shop	80 Charter Oak Ave.
Potrero Division (TCs) – Operations and Maintenance	2500 Mariposa St.
Presidio Division (60' articulated TCs) – Operations and Maintenance	949 Presidio Ave.
Scott Center (non-revenue fleet maintenance)	1849 Harrison St.
Sign Shop	1999 Bryant St.
Woods Division (MCs) – Maintenance	1095 Indiana St.
Woods Division (MCs) – Operations	1001 22nd St.

Green Building: This section lists SFMTA's LEED accredited staff, LEED and Green Building projects, and EV infrastructure in public and staff locations.

- ✓ LEED Accredited Professionals: Peter Gabancho and So-Man Leung

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

SFMTA Location:	LEED qualification:	Highlights:
SFMTA Headquarters Building One South Van Ness	Operations & Maintenance (O&M)	Green/living roof (see Success, below)
One South Van Ness, 6th floor	Commercial Interiors (CI) Silver anticipated	Improved HVAC; water-saving fixtures; 25,000 sq. feet
One South Van Ness, 8th floor (co-tenant with Controller's Office)	CI–Gold anticipated	Improved HVAC; water-saving fixtures; 25,000 sq. feet (shared)
Central Subway	Maximum points will be pursued; difficult to LEED certify	Opportunities exist outside of LEED for greening infrastructure and track ways
Islais Creek Bus Division	New Construction (NC) Silver anticipated	Designed to accommodate fueling and maintenance of alternative fuel vehicles; 50,000 sq. feet
Central Control/Operations Center	Interior Design Certification (IDC) Silver anticipated	41,000 sq. feet

Success: The green roof on SFMTA's Headquarters Building, One South Van Ness, was designed by Rana Creek, also responsible for the green roof on the California Academy of Sciences. Completed in December 2010, the 11,000 sq. foot green roof will begin hosting limited employee and other special tours in fall 2011.

Images: Green roof on SFMTA Headquarters at One South Van Ness Avenue

Time-lapse video of the work:
http://sfdpw.tumblr.com/post/1426879322/the-department-of-public-works-recently-designed

Next steps: Green roof information boards in the lobby, with video screens showing live views of the roof.

Electric Vehicle Charging Stations in SFMTA Public Parking Garages:

Success: A total of 60 chargers providing Level 1 and 2 charging capability will be publicly available in the SFMTA's 20 parking garages by the end of 2011. These chargers are funded through the American Recovery and Reinvestment Act (ARRA), and are being provided by Coulomb Technologies through their Charge Point America Program. Twenty seven of these chargers will be installed at 13 SFMTA facilities over the next three months.

Photo: Electric charging facility

The following is a summary of chargers already installed at SFMTA locations. These locations are also listed on SFMTA's website. Many of the legacy chargers listed below will be replaced with the new Coulomb dual-level chargers – allowing an electric bicycle (or similar battery-powered mobility device) and a car to charge from the same station at the same time:

Garage:	Number of Chargers:	Usage Comments:
Civic Center	7	4 chargers used daily for City vehicles; 3 are older style and not used
Fifth & Mission	4	
Ellis – O'Farrell	2	
Golden Gateway	2	Used daily for 8 hrs/day
Japan Center	2	Inductive charger used once/month; conductive charger is 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
Lots:	There are no EV chargers on off-street metered lots	
Total:	31	

- The Polk-Bush garage will have a Coulomb dual-level charger installed in 2011

700 Pennsylvania has a high-voltage electrical outlet circuited and dedicated to staff member plug-in electric vehicles.

✓ 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.	Installation begins May 2011	
Maintenance of Ways 700 Pennsylvania	127 kWh solar rooftop panels; 159,639 kWh/yr.	Estimated June/July 2011 bid award approval; 2012 installation	Federal funding; received one bid return; 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 during next year; per shelter power generated accounts for shelter electricity usage

Challenges:

- Some shelter locations do not receive direct sun
- PG&E service type: downtown network does not allow grid-tied solar
- Shelters connected to street lighting circuits and buildings for power cannot accept grid-tied solar for life-safety reasons

Vehicle energy generation: In addition to renewable generation from facilities, it should be noted that SFMTA light rail vehicles and trolley coaches include regenerative braking (propulsion motors turn into generators during vehicle deceleration, sending power back into the electrical grid). SFTMA's hybrid buses also include regenerative braking, recapturing (by charging hybrid-system batteries) up to 30 percent of the power used during acceleration and hill climbing.

✓ FY09-10 Water Consumption:

- 23,962,832.1 gallons totaling $99,775.35

✓ Water Efficiency and Conservation:

- Water-saving toilets and urinals were installed at One South Van Ness in 2010

In January 2011, more demanding regulations were put in place for new construction water-saving irrigation requirements. SFMTA Planning staff and Construction staff will meet with Julie Ortiz, SFPUC Water Conservation Manger, and staff from SFPUC's Storm Water Abatement group, to better understand the program and determine best practices for optimizing water use at new and existing SFMTA locations.

Sarah Rhodes, with SFPUC's Water Re-use program, is a resource for further discussing water recycling options related to SFMTA operations (for example, it may be feasible for water pumped from Central Subway and other underground stations to be used for surface plant irrigation along those corridors).

3b. Fleet – Fuel Use & Reduction Measures

✓ FY09-10 Carbon Footprint from Fuels:

Fuel:	Consumption:	CO2e (metric tons):	Cost:
Biodiesel blends (Gals)	5,028,168.71	50,665.48	$12,483,964.99
Gasoline (Gals)	270,024.94	2,378.92	$780,809.02
CNG (GGE)	7,481.77	45.69	$14,974.12
LPG (Gals)	5,303.89	30.71	$21,085.86
Total:	$250.39 vehicle fuel/ metric ton CO2e	53,120.80	$13,300,833.99

Challenges:
- Additional biogenic content reductions not always factored into City accounting
- 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
- There are no fuel storage leaks – this was a precautionary measure
- Average bus fleet biodiesel blend dropped from B20 (20% biodiesel blend) to B10

Biodiesel blend percentages and reduction compared to SFMTA's 1990 footprint:
- 2012 SFMTA requirement = 20% reduction
- Current B10 average = 21% reduction
- Resuming B20 average = 35% reduction (accounting for biogenic content)
- These calculations also include fuel saving hybrid buses and all other current SFMTA energy saving initiatives

Note: B50 average for SFMTA locations would produce a 10 percent reduction in the City's municipal carbon footprint (total of all departmental emissions) – this alone is half of the Citywide municipal goal: 20% reduction in 1990 carbon emissions by 2012.

Sustainability:
- "Up stream" emissions are not factored into liquid fuel as with electricity usage
- Darling International has announced plans to build a 10 million gallon/year biodiesel production facility in San Francisco by 2012. This facility will be capable of processing locally collected restaurant grease as feedstock for local biodiesel production
- This project could potentially power all SFMTA diesel vehicles with fuel that never leaves the City limits from fryer to fuel tank

✓ Alternative Fuels, Removal of 12 yr + Vehicles, Fleet Conversion/Reduction:

Images of transit fleet: bus, light rail vehicle, cable car, trolley coach and historic streetcar.

SFMTA Vehicle Fleet:	Units:	Fuel Type:	Age (yrs):	Green Facts:
Trolley Coaches	313	Electricity	11-17	Largest zero emission bus fleet in North America
Motor Coaches (includes reserve)	420	Biodiesel blends	9-12	Exhaust filters (PM+NOx) installed on all buses; active fleet to be replaced by hybrid buses 2014-2018
Hybrid buses	86	Biodiesel blends	5	5th largest fleet in the U.S.
Light Rail Vehicles	151	Electricity	8-14	
Historic Streetcars (available for service)	40	Electricity	60-120+	
Cable Cars	40	Electricity from motors located in the cable car barn	Historic landmark fleet – only one in U.S.	Electricity meter in cable car barn spins in reverse when more cars are going downhill than up (funicular-like effect)
Transit fleet total:	**1,050**	Electricity powers 59% of the transit fleet	5-120+	Lowest per-passenger multi-modal transit emissions in California
Paratransit Vans	**60**	Biodiesel blend and gasoline	<5	58% run on biodiesel
Parking Control Officer vehicles	**277**	Gasoline	38% are >10 yrs.	Researching alternative modes and greener vehicles
Non-revenue fleet	**519**	Biodiesel, CNG, gasoline, LPG	62% are >10 yrs.	Emissions regulated by the state (CARB and BAR)
Taxis (regulated) Not accounted for in SFMTA's footprint – see Challenges	**1,480**	Gasoline and CNG	<5	72% of the taxi fleet are hybrid (954) or CNG (107); 25 plug-in and 25 battery-swap electric vehicles to be added to the fleet in 2012

- 50% of SFMTA's 3,386 vehicles are alternative fuel or zero emission vehicles
- In 2011 the SFMTA will begin testing two different fuel cell bus technologies and a hybrid paratransit van in revenue service for 12 months

- See page 4, Section 2, SFMTA-SFE Clean Air Plan, for more details regarding Removal of Vehicles >12 Years, Fleet Conversion, and Fleet Reduction
- See Section 3a, Green Building, for details on SFMTA electric vehicle charging infrastructure in public and employee locations

Fleet Verification: It is recommended that the SF Environment-managed summary records 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.

Challenges:

1) Baseline year comparisons. SFMTA baseline emission totals from 1990 (through 2001) are exclusively Municipal Railway (Muni) in SF Environment's current records 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.
2) 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.

✓ Participation in Shared Vehicle Pools:

The SFMTA manages its own shared vehicle fleet for staff member use, but is otherwise not participating in City vehicle pools, City Car Share, or similar programs. There is interest in re-joining these programs pending discussions on contracting and financial policies.

4. Other Sustainable Practices

This section includes Zero Waste, Employee Commute, Green Purchasing, Information Technology, and Urban Forest efforts. Here are some highlights:

- ✓ Waste Assessment Questionnaires are attached as Appendix A
- ✓ Transportation Survey results include:
  - 22% increase in survey return rate
  - Half of the surveys returned were from staff that do not use work e-mail
  - 44% reported using transit, shared rides, bicycles, or walking to commute during the week
  - 60% of transit commuters used SFMTA as their primary mode
- ✓ Buy Green Scorecard has been submitted and is attached as Appendix B
- ✓ IT energy efficiency continues with computer-server consolidation
- ✓ Urban Forest activities, in addition to Pavement to Parks, Traffic Calming, and Pedestrian programs, include SFMTA management of up to 1,000 trees in dozens of landscaped areas all over the City. These programs have yet to be quantified in terms of SFMTA's carbon sequestration

4a. Zero Waste

✓ See Appendix A for Waste Assessment Questionnaires.

Success: Agency Recycling Coordinator, Violet Henderson, has coordinated facility recycling programs, contacts and supervisors at most of SFMTA's 27 locations and facilities.

Photo: Lunch room in 700 Pennsylvania, Building-A

Challenges: The SFMTA has five facilities that are in the City's top 20 for waste production: Woods, Kirkland, Flynn, and Presidio Bus Divisions, and the Green Light Rail Division.

Next steps:

1) Complete the recruitment/assignment of Recycling Coordinators and responsible supervisors at every SFMTA location
2) In cooperation with SF Environment staff, hold regular coordination meetings with all SFMTA Recycling Coordinators in order to best optimize each location's program specifics:
    - An estimated $250,000/year in operating costs can be saved through optimizing these programs (ensuring that trash compactors at maintenance facilities are appropriately sized)
3) Schedule SF Environment presentations at various SFMTA locations

4b. Employee Commute

In 2010 SFMTA created a new position of transportation demand management (TDM) project manager to lead agency policy and programmatic efforts focused on shifting single occupancy vehicle trips to alternative modes for SFMTA staff and through external SFMTA projects and programs. Projects will include shuttle coordination with major employers, integration of TDM best practices in new mixed-use and residential developments, and strategies that remove barriers to taking transit, walking, bicycling, and ridesharing throughout the City.

This section includes results from the 2011 Transportation Survey and a summary of current Commuter Program activities.

Transportation Survey

✓ Dates: The survey was administered from Jan. 3 to Jan. 14, 2011

✓ Response rate: 741 responses from 5,020 employees = 14.8 percent
- Overall response rate increased by 22% compared to last year (741 vs. 607)
- E-mail return rate dropped by 6% (378 vs. 401)
- Paper copy return rate increased by 76% (363 vs. 206)
- Half of the surveys returned are from staff members that do not use work e-mail – the segment of SFMTA staff that are assumed to have the most challenging commutes due to location and hours
- This year's results can be expected to be more reasonably representative of 'in the field' staff members, due to the increase in the number of paper-copy surveys returned versus e-mail responses
- Shortfall in terms of percentage of staff member responses in one group is transit operations at roughly 10% This is the most challenging group to reach efficiently with surveys due to the nature of their 'behind the wheel' work

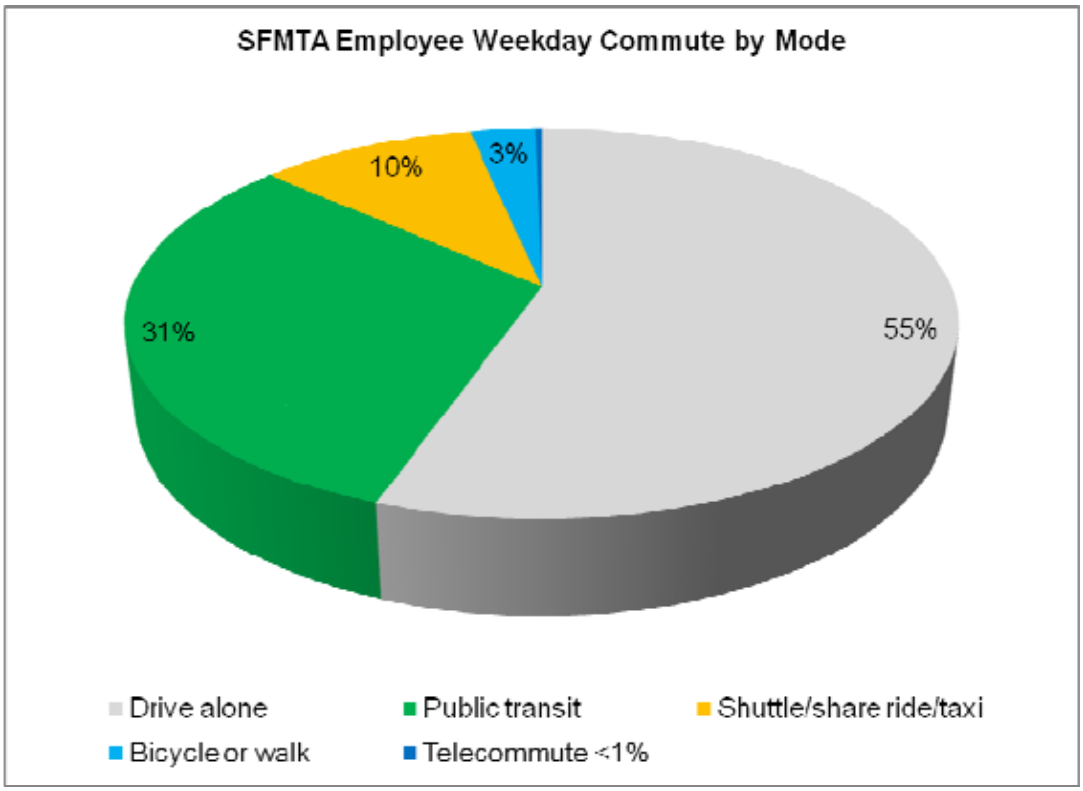
✓ Result Highlights: (all percentages of 741 responses, unless otherwise noted)

One-way commute time:
- 8% require just 10 minutes or less to go between home and work
- 22% take between 11-20 minutes
- 59% commute between 20-60 minutes each way
- 11% commute more than 60 minutes each way

Work arrival time:
- 7% arrive to work before 5 a.m.
- 65% arrive between 5 and 9 a.m.
- 21% arrive between 9 and 2 p.m.
- 7% arrive to work after 2 p.m.

Work leave time:

- 17% leave work before 12 p.m.
- 58% leave between 2 and 6 p.m.
- 18% leave between 6 and 9 p.m.
- 7% leave work after 9 p.m.



SFMTA Employee Weekday Commute by Mode

Mode	Percent
Drive alone	55%
Public transit	31%
Shuttle/share ride/taxi	10%
Bicycle or walk	3%
Telecommute <1%	0%

- These weekday results are consistent with San Francisco averages for all commuters (see 2011 CAS report for the City's transportation sector)

- SFMTA Employee Weekend Commute by Mode:
  79-80% Drive alone

10-13%	Take public transit
6-7%	Share a ride/shuttle or took a taxi
1%	Bicycle or walk
1%	Telecommute

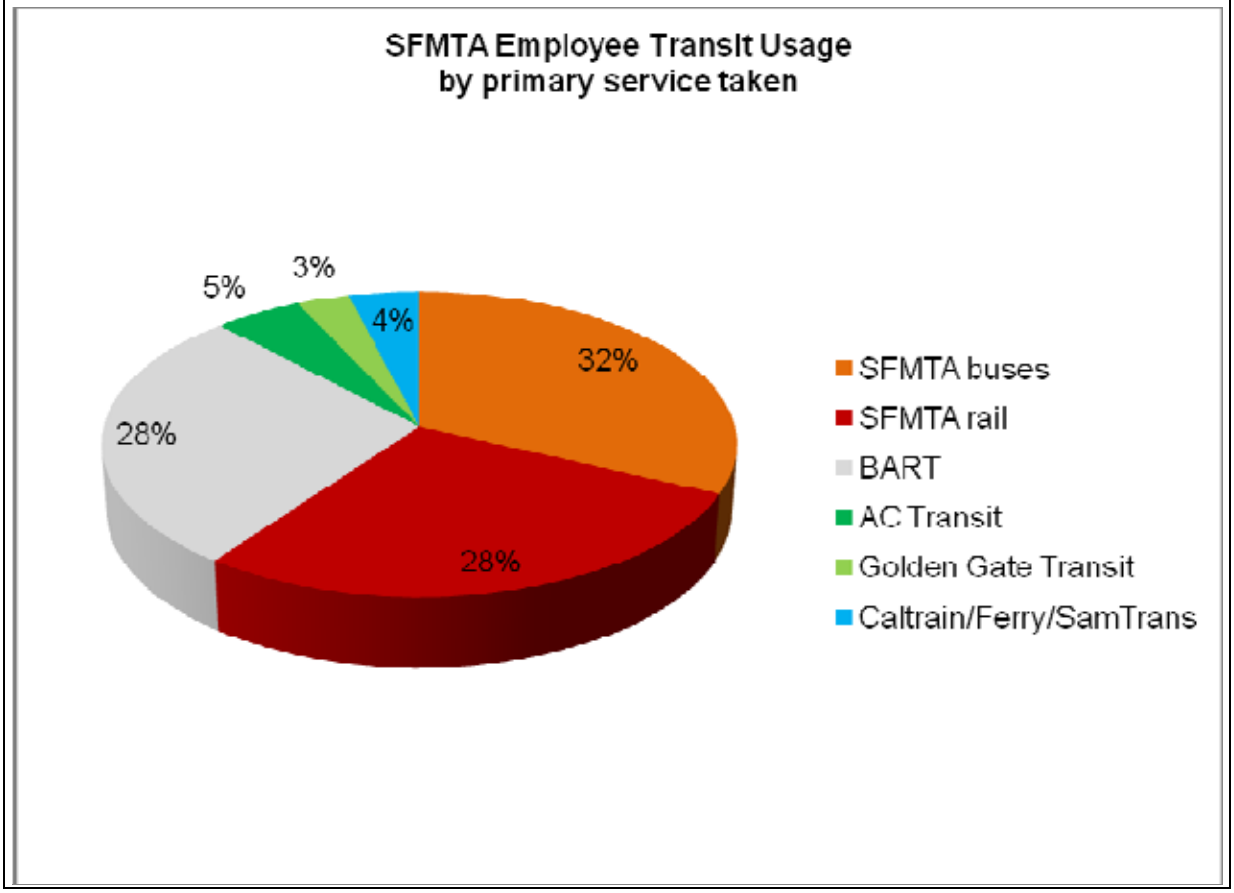
- 92% of employee commute trips are made on weekdays

Reasons for commute driving alone (814 answers from 741 surveys):

- 68% stated driving alone is more convenient, more flexible, less-stressful, and that public transit does not match their schedule
- 22% stated adverse weather conditions
- 16% have difficulty finding people to carpool/vanpool with
- 14% do not feel safe using public transit
- 12% use their vehicles for work
- 11% believe that driving alone saves money

Incentives to discourage driving alone (501 answers from 741 surveys):

- 31% stated that nothing could discourage them from driving alone
- 25% would prefer more convenient, reliable, and comfortable transit
- 20% would prefer having an alternative schedule or telecommuting
- 17% stated that financial assistance for public transit would help
- 8% stated that paying for parking would discourage them from driving



SFMTA Employee Transit Usage by primary service taken

Transit Service	Percent
SFMTA buses	32%
SFMTA rail	28%
BART	28%
AC Transit	5%
Golden Gate Transit	3%
Caltrain/Ferry/SamTrans	4%

Familiarity with alternative commute programs:

- 81% are not enrolled in employee commute benefits
- 39% further stated that they are not familiar with employee commute benefits
- 81% have never heard of the program or do not know much about it
- Three survey respondents have used the Emergency Ride Home program
- 31% answered that they are not enrolled because they do not ride transit

Challenges: Administering the Transportation Survey was perhaps the most challenging area of DepCAP implementation. E-mail distribution of the survey was straight forward. However, administering paper copies required significant resources and logistics. Roughly 3,000 of 5,000 SFMTA employees do not have regular access to work e-mail (Muni Operators making up the largest percentage), and so these employees required paper copies of the survey. Additionally, within the 27 different facility locations, there are roughly 50 separate groups that required paper copies, collection boxes, and other group-specific accommodations. This translated to six reams of paper (2,945 double-sided copies) and a significant time commitment to administer the survey. In addition to SFMTA staff administering the paper version of the survey, SF Environment put together a small staff to summarize and record the results. Unfortunately, despite all of the effort, the return rate for the hard copy version of the survey was extremely low.

Also challenging was the fact that at the same time the Transportation Survey was being administered, the SFMTA established a policy for the first time to charge all employees for parking fees at SFMTA locations, creating an extremely sensitive survey environment due to the related nature and timing of both efforts. This may have affected the response rate for this survey.

One technique to consider for future surveys would be to assign staff to verbally survey employees at each facility to reach the various shifts of the employees, in an effort to increase the response rate.

Next steps: recommendations to SF Environment for subsequent survey years:

1) Consider administering the Transportation Survey every-other year:

- This would help avoid survey ‘burnout’ and save labor/material resources
- Annual response differences are minimal

2) Consider offering an incentive to return the survey (prize drawing, gift certificates, special uniform patch/pin stating their ‘green’ credentials, etc.):
   - This would help motivate previous non-participants and those that feel they have already provided their information in previous years
3) Consider non-paper alternatives other than e-mail accounts:
   - Dedicate a Transportation Survey computer terminal, iPad, or similar hardware at each location. Provide an incentive to complete the survey using one of these access points
   - During a two-week period, in order to capture smart phone users and similar devices, require survey completion as a “home page” portal for WI-FI access
   - Integrate this into all administrative staff performance plans to ensure compliance.
4) Code survey responses to allow different functional areas within the Agency to be analyzed independently

Commuter Programs

The following summarizes participation in the SFMTA's commuter programs, which are available to all 5,000 SFMTA employees

✓ City and regional commuter programs:
- 198 SFMTA staff are enrolled in the City's Commuter Benefits Program (down from 230 staff enrolled in December 2009)
- 43 staff participated in MTC's Great Race for Clean Air program
- 21 staff have requested bicycle fleet information from SF Environment since May 2007 (note that this number is low, in terms of representing bicycling interest/participation, due to SFMTA's already strong bicycling program)
- Three outreach efforts were conducted, highlighting ridesharing, at One South Van Ness Avenue on April 1, May 13 and May 17, 2010

✓ 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
- The bicycle parking room at One South Van Ness Avenue has been upgraded and there is an existing fleet of three bicycles for employee field work
- The SFMTA will investigate the cost and feasibility of implementing new incentives. This might include a shuttle program to pick-up and drop-off transit operators from key regional transit stations in San Francisco to their work sites

Challenges: As detailed in the previous section, Transportation Survey, the majority of SFMTA employees (3,000+) do not have regular access to work e-mail. Additionally, these employees are spread out throughout the City, in 27 separate locations, many working evening and all-night shifts. These significant outreach logistics are challenging to overcome and require location-specific techniques

Next steps: The SFMTA will work to increase participation in all of these Commuter Programs and alternative commute incentives through at least the following efforts during the next year:

- Brown bag lunch and other presentations with SF Environment
- Commuter Program e-mail outreach to employees
- Commuter Program information attached to paychecks
- Commuter Program information highlights in the employee newsletter

4c. Green Purchasing

- ✓ SFMTA's Buy Green scorecard is attached as Appendix B to this report
- ✓ SF Environment's Jessian Choy is providing a consultation to the SFMTA Green Purchasing team on April 21, 2011

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4d. Information Technology

- ✓ Citywide DepCAP Information Technology goals and FY09-10 SFMTA updates:

- *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 will be the primary area of focus for IT greening for the next reporting cycle. 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. This is a prime opportunity to visibly acknowledge employees that demonstrate exemplary green credentials (similar to the "Heart of the City" charities campaign where contributors get red hearts posted next to their name plates).

- *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.

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)

Challenges: 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. As previously noted, 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.

Next steps: The quantifiable benefits (carbon sequestration) of SFMTA's share of the Urban Forest have yet to be calculated. This is an area of Sustainability Implementation that requires additional work as follows:

1) Hire an arborist to audit each location (count, measure, identify species):
   - City contractor, Jim Simpson (Hort Science) 'wrote the book' on urban tree management. Other Departments have used his help extensively
   - Another option is to have SFMTA staff and/or Citywide interns trained to perform the audit in part through SF Environment workshops
2) Utilize SF Environment's upcoming software "tree tools" to record audit results:
   - See the 'beta' test of the software: http://www.urbanforestmap.org/
   - To date only SFDPW and Friends of the Urban Forest have populated this map
   - Goal is to join all City Departments in populating the map
3) Determine whether SFDPW or SFMTA takes the carbon credit for Urban Forest planted and maintained along transit routes, so that these are not double counted in Citywide inventory.
4) Use "tree tools" to quantify carbon sequestration through the U.S. Forest Service CUFR Tree Carbon Calculator

5. Communitywide Impact

Outreach success – inspiring the next generation: The Monterey Bay Aquarium is currently featuring an exhibit on global climate change, featuring a kid-friendly presentation on what cities around the world are doing to reduce energy consumption. For San Francisco, a Muni bus is featured on one of the display tiles. Flipping the tile over reveals the statement that San Francisco is using biodiesel in transit buses to help reduce greenhouse gas emissions 20 percent by 2012.

Images: of SFMTA ad campaigns

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 itself contributes one percent to the City's overall carbon footprint, it directly prevents much larger amounts of emissions by attracting people to sustainable transportation modes. Approximately half of San Francisco's residents commute to work by transit, walking, carpooling or bicycling.

Implementation success:

Bicycle Plan Implementation, since the lifting of the injunction in August 2010:

- 11 miles of bicycle lanes have been striped
- 31 miles of sharrows added to streets
- 750 bicycle racks have been installed
- Funding for bicycle sharing has been secured (for 500 bicycles)

Recent Pedestrian Safety improvements include:

- Golden Gate Park sidewalks widened and curb bulbs added for bus boarding
- Tenderloin curb bulbs added
- Crosswalks modified for increased visibility at more than 50 intersections
- Seven crosswalks scheduled to re-open
- Safe Routes to Schools project: assigning crossing guards; re-striping worn crosswalks near schools
- State of Walking in San Francisco Report scheduled for 2011 release
- Walk First project is identifying: network of key streets; criteria for prioritizing pedestrian safety improvements; pedestrian volume model

Photo: Bicycle sharing demonstration

Proposition A (2007) requires the SFMTA to reduce greenhouse gas emissions from its own operations, consistent with the 2004 SF Environment Climate Action Plan (CAP) and Supervisor Mirkarimi Ordinance (2008) enforcing the municipal aspects (DepCAPs) of the climate plan. Further, through a Climate Action Strategy report every two years, Prop A also requires the SFMTA "to develop and implement strategies for substantially reducing emissions" in San Francisco's transportation sector (all land-based mobile sources). The SFMTA's Prop A 2011 deliverables are:

- SFMTA Departmental Climate Action Plan (DepCAP): annual municipal inventory
- SFMTA Climate Action Strategy (CAS): bi-annual transportation sector report

In 2009, the Agency developed an initial report in response to Prop A, including both DepCAP deliverables and the transportation sector Climate Action Strategy (CAS) in one report. The emphasis was on a summary of DepCAP work, current and historic, with initial problem statements, reduction progress due to SFMTA efforts, and a summary of future challenges regarding the larger scope of transportation sector emissions.

In addition to summarizing strategies and initiatives implemented to date, the three-pronged goal of the 2009 report was to introduce and emphasize the following concepts that are important, but may not be readily apparent:

1) SFMTA Vehicles relative to the Transportation Sector: The SFMTA's carbon footprint is roughly 2% of total transportation sector emissions. These two areas are related but separate in terms of policies, funding, timing, and influence
2) Inverse Relationship: The SFMTA's carbon footprint may need to grow in order to reduce the overall transportation sector emissions. More auto drivers converting to transit shifts the individual footprint to transit (more emissions from transit vehicles, support facilities, and employees) while reducing emissions from the transportation sector as a whole
3) Funding Challenges: The SFMTA's already low level of emissions, with over half its fleet consisting of zero emission vehicles, makes it difficult to compete with higher-emissions applicants for funding awards that are calculated on emissions reduction per dollar. Further, the majority of funding for transit agency emissions reductions projects are for particulate matter (PM) and oxides of nitrogen (NOx) efforts rather than energy reduction and greenhouse gas emissions

The 2011 CAS is focused on the transportation sector, detailing new research, conclusions from extensive planning model runs, and an analysis of best practices from around the world. The 2011 CAS report is being finalized and presented to key stakeholders as of the submittal date for this DepCAP report.

Photo: Muni bus

Appendices

A: Waste Assessment Questionnaires
B: Buy Green Scorecard