

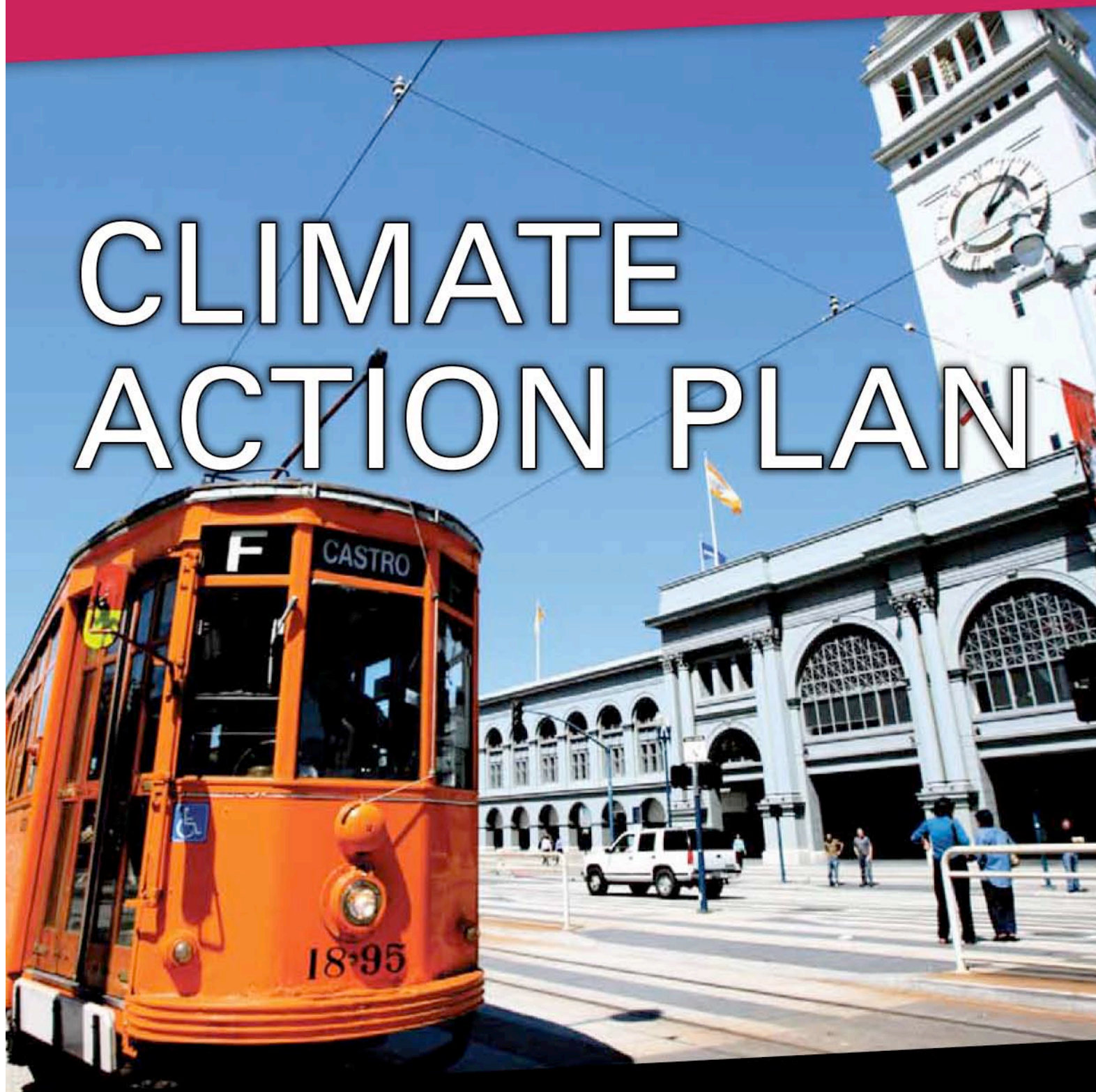
## **Appendix E**

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**Appendix E: *Climate Action Plan, Draft for Public Review*. San Francisco Municipal Transportation Agency. December 19, 2008.**



# CLIMATE ACTION PLAN



SFMTA Climate Action Team and Staff Contributors

Sam Fielding  
Amit Ghosh  
Jason Lee  
Marty Meller  
Jerry Robbins

Peter Albert – Planning  
Jeffrey Banks – Taxis  
Andrew Braver – Maps  
Murray Bond – Editing  
Elena Chiong – Energy Use  
Brian Dussault – LED Traffic Signals  
Jack Fleck – Planning  
John Fong – Capital Projects  
Richard Fonseca – Non-revenue Vehicles  
John Funghi – Capital Projects  
Peter Gabancho – Capital Projects  
Elson Hao – Bus Technologies  
Darton Ito - Planning  
Julie Kirchbaum – TEP  
Frank Lau – Smart Bus Technologies  
Chimmy Lee – Layout  
Frank Markowitz – Agency Introduction  
Bill Neilson – Capital Projects  
Neal Popp – Bus Technologies  
Jay Primus - Planning  
Britt Tanner – Transit Effectiveness Project  
Marianne Urrutia – Energy Use  
Nita Rabe-Uyeno - Parking Garages  
Jane Wang – Capital Projects  
Deirdre Weinberg – Bicycle Parking  
Annette Williams – Paratransit  
Paul Williamson – Bus Technologies  
Ken Yee – Solid Waste

**TABLE OF CONTENTS**

<b>SECTION</b>	<b>PAGE</b>
<b>I: - EXECUTIVE SUMMARY</b>	<b>6</b>
<b>II: THE THREAT OF CLIMATE CHANGE</b>	<b>9</b>
The Science of Climate Change	9
The Consequence of Climate Change	10
Transportation and Climate	10
The SFMTA's Role in Mitigating Climate Change	11
Meeting Challenges and Opportunities	14
<b>III: THE CHALLENGE: REDUCING GREENHOUSE GAS EMISSIONS</b>	<b>15</b>
City of San Francisco Emission Reduction Targets	15
Proposition A Transportation Sector Reduction Targets	16
<b>IV: MEASURE OF PLAN AND PROGRAM SUCCESS</b>	<b>19</b>
Agency Targets and Goals	19
Progress Indicators	19
The SFMTA's Baseline 1990 Energy Use	20
Transportation Sector Challenges and Opportunities	20
The SFMTA's Inversely Proportional Role in Reducing Citywide CO <sub>2</sub>	21
Tracking Progress	21
<b>V: EXISTING CLIMATE CHANGE MITIGATION MEASURES AND INTERNAL FOOTPRINT</b>	<b>23</b>
<b>A. Transportation Sector</b>	<b>23</b>
Transit	23
Transit Effectiveness Project	25
NextBus	26
Signal Priority Project	26
SFMTA Customer Service Center	27
TransLink	27
311	27
511	27
SFgo	28
Supplemental Transit Service	28
Bicycling	28
Pedestrian Program	29
Better Streets Plan	29
Pedestrian Traffic Signals	29
Accessible Pedestrian Signals	29
Golden Gate Park Pedestrian Improvements	30
School Safety	30
Parking Authority	30
Electric Vehicle Chargers	30
Reduced Rate Carpool Parking	31
Motorcycle Parking	31
Carshare Parking	31

<b>B. Transit and Non-Revenue Vehicles</b>	<b>32</b>
Footprint	32
Reduction Measures - Transit Vehicles	35
1999-2002 NextBus Project	35
2001-2003 Alternative Fuel Pilot Program	35
2004 Clean Air Plan	36
2006 Biodiesel Implementation	38
2010 Compound Fuel Cell Hybrid Bus Demonstration Project	38
2010 Advanced Fuel Cell Bus Demonstration Project	39
Non-Revenue Vehicles	39
<b>C. Facilities and Infrastructure: Energy Efficiency and Renewable Energy Footprint</b>	<b>41</b>
Current Reduction Measures	42
MECA Audit	42
PUC Energy Audit	42
Real Estate Department Audit and Improvements	42
LED Traffic Signal Conversion	42
Solar Installations	42
<b>D. Solid Waste and Recycling</b>	<b>43</b>
<b>E. Employee Commute</b>	<b>44</b>
Overview of Employee and Citywide Commute Patterns	44
Employee Home Locations	44
Current Trip Reduction Measures	45
City and County of San Francisco Employee Commuter Benefits	46
Spare the Air Days	46
Free Tourist Buses	46
Vanpools	47
Carpools	47
Casual Carpooling	47
Taxis	47
Private Shuttles	48
<b>F. Capital Projects</b>	<b>49</b>
Green Building Ordinance	49
Muni Metro East	49
Islais Creek Bus Division	49
Central Subway	50
Clean Construction Guidelines	50
<b>VI: ADDITIONAL CLIMATE ACTION PROGRAMS AND EFFORTS POTENTIAL AND NECESSARY NEXT STEPS</b>	<b>51</b>
<b>A. Vehicular Emission Reduction</b>	<b>52</b>
Transit Vehicles Including Non-Revenue Vehicles	52
Non-Transit Vehicles	53
Private Electric Vehicles	53



<b>B. Vehicular Demand Reduction Measures</b>	<b>53</b>
Transit Oriented Development	53
SFpark	57
Congestion Pricing	58
Other Vehicular Demand Reduction Measures	59
<b>C. Major Transit Service Expansion</b>	<b>59</b>
Bicycling and Pedestrian Improvements	59
Transit Effectiveness Project	60
Accelerated Transit Expansion Program	62
<b>VII: FUNDING</b>	<b>73</b>
Operating Funding Capacity	75
Capital Funding Capacity	78
Potential Revenue Sources	78
<b>VIII: SUMMARY AND CONCLUSIONS</b>	<b>81</b>
<b>ACRONYMS</b>	<b>82</b>
<b>APPENDIX</b>	
APPENDIX A - SFMTA Introduction	84
APPENDIX B - State Climate Action Legislation	87
APPENDIX C - Proposition A	88

## **I. EXECUTIVE SUMMARY**

Climate change is the world's most serious environmental challenge. It is primarily caused by greenhouse gases (GHG), principally carbon dioxide (CO<sub>2</sub>), and referred to as carbon emissions, which are produced from fossil fuel combustion. These gases are accumulating in the atmosphere, trapping heat and turning the Earth into a greenhouse. As temperatures continue to increase, weather may become more extreme, large portions of the polar ice caps could melt and other effects may create a ripple of worldwide environmental problems. In California, negative impacts may include hotter summers and warmer winters, more intensive droughts and less snowfall, inundation of low-lying areas and more frequent and intensive fires. A more severe climate will harm agriculture, tourism and other segments of the California economy. Left unchecked, human-induced climate change can destabilize ecosystems that have taken millions of years to evolve.

Leading scientific experts have indicated that worldwide carbon emissions must be reduced to 80 percent below 1990 levels by 2050 in order to avoid catastrophic climate change. Consistent with this target, the City of San Francisco is working to achieve a short-term 20 percent reduction below 1990 levels by 2012. San Francisco's 2005 level was five percent below 1990. However, since San Francisco's population is projected to be 13 percent higher than 1990 levels in 2012, *per capita* carbon emission reductions required will be higher than stated targets.

Reducing the severity of climate change requires immediate reductions in energy use while producing the remaining necessary energy from non-polluting sources like solar, wind and water. Since roughly half of San Francisco's carbon emissions come from the transportation sector, a reduction in total vehicle miles traveled and a mode shift to low and zero emission vehicles is necessary to mitigate climate change.

The San Francisco Municipal Transportation Agency (SFMTA) 2009 Climate Action Plan details policies, program, goals, funding and relationships with other City departments to reduce GHG emissions in the transportation sector and in agency operations.

As an organization responsible for pedestrian circulation, bicycling, parking, street management 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 carbon footprint, it directly prevents much larger amounts of emissions by attracting people to sustainable transportation modes. Approximately 50 percent of San Franciscans commute to work by transit, walking, carpooling or bicycling – a higher percentage than nearly every other American city.

In 2002 the Board of Supervisors passed the *Greenhouse Gas Emissions Reduction Resolution*, which calls for a *Climate Action Plan* for the City and County of San Francisco. With the San Francisco Department of Environment leading interagency coordinating and preparing a comprehensive, citywide plan, the City has directed each department to outline plans to reduce its own energy use "footprint" and to meet the target of reducing 1990 carbon emission levels by 20 percent by 2012. SFMTA will likely meet this goal. Since 1990 it has replaced its diesel motor coach fleet with modern, low-emission models and introduced fuel efficient hybrid buses. More than half of Muni's revenue vehicles are powered by non-polluting, hydroelectric power, including light rail trains, historic streetcars, cable cars and the largest fleet of electric trolley buses in North America. Muni has also begun to implement its *Clean Air Plan: Zero Emissions 2020*, a blueprint for further reducing motor coach emissions and fossil fuel use through bridging technologies such as hybrid and fuel cell buses and cleaner fuels such as biodiesel.

In addition to the City departmental goal of a 20 percent reduction, Proposition A, passed by voters in November 2007, included a 20 percent reduction goal specific to the entire transportation sector. Proposition A also calls for the SFMTA to prepare its own *2009 Climate Action Plan*, which will complement the SF Department of the Environment's plan by focusing on emission reductions achieved through transportation policies and programs. Among City agencies, the SFMTA and its multi-modal purview is



especially able to effect significant reductions since private automobiles are the primary source of emissions in this sector, representing 60 percent of the problem. Remaining emissions come from heavy trucks and buses, trains, boats, planes and all other mobile sources. The SFMTA *2009 Climate Action Plan* outlines steps needed to achieve this goal, including emission free vehicles, fewer vehicle miles traveled and modal shift to transit, bikes and walking.

The SFMTA is working to reduce the impacts of automobile emissions and congestion through multiple initiatives. For example, the Transit Effectiveness Project (TEP) aims to attract motorists onto transit through a faster, more reliable and more efficient transit system. Using existing resources, the TEP will reorganize the Muni network of bus routes and rail lines to concentrate service improvements along the most heavily-traveled corridors. Another program, *SFpark*, will test variable pricing to improve the management of the City's limited parking supply. A major goal of *SFpark* is to reduce congestion and pollution associated with circling for parking. In addition, the SFMTA's Transit-Oriented Development (TOD) program, supported by planning and redevelopment programs in the City, will include converting property owned by the SFMTA and property adjacent to significant Agency transit facilities to land uses that support and build upon transit ridership. This, in turn, will foster a lifestyle that presents a smaller carbon footprint than non-TOD projects, as studies show, and will generate revenue for the SFMTA to support the system's operation.

Existing SFMTA initiatives will help reduce the City's transportation-related carbon emissions as every transit passenger mile saves four total vehicle miles traveled; however, achieving the 20 percent reduction goal will require a major shift from single occupancy gasoline powered cars to transit, bicycles, walking and other sustainable transportation modes, as well as to cleaner automobiles and trucks. This can only be attained with a major infusion of resources.

Currently most SFMTA buses and trains are full during peak hours, and while some capacity exists during off-peak hours, service levels can be inadequate to attract discretionary ridership. As a result, people are choosing to drive and the SFMTA is not capturing the ridership that it could. At one time, over 950,000 customers per day used transit in San Francisco compared to 700,000 today. Systemwide service increases will require significant operating and capital funding. With substantial cuts in state operating funding and a weak economy, the SFMTA will have immediate difficulty maintaining, let alone expanding, the current transit service it operates and other transportation programs it manages. While a detailed budget has yet to be developed to include all of the proposed initiatives in this plan, an order of magnitude calculation suggests that incrementally higher operating costs could be hundreds of millions of dollars annually and that additional capital costs could also be hundreds of millions of dollars. On the other hand, incremental revenue from candidate initiatives such as the TOD program, *SFpark* and congestion pricing would likely be in the tens of millions of dollars range.

Passenger vehicle trips are the single largest contributor to transportation sector emissions. Due to an increased number of passenger vehicle miles, the transportation sector's share of citywide GHG emissions is growing despite the fact that overall citywide GHG emissions are going down. The SFMTA is coordinating policies, programs and incentives to encourage the use of plug-in electric and other advanced passenger vehicle technologies as well as the use of cleaner fuels. This includes working on green parking policies and partnering with the SF Department of the Environment to lead the collaborative effort between the City, the public and industry stakeholders to make San Francisco ready for the mode shift to plug-in vehicles. The SFMTA is committed to taking bold action to start the process and is poised to provide positive market signals for the companies that are going to be counted on to provide plug-in vehicles.

The SFMTA will also work with other City departments to strengthen investment and incentive efforts in transit oriented land development that will provide certain emission-reduction benefits and reflect an increasingly popular consensus in reducing GHG emissions. The SFMTA recognizes that these investments and efforts in turn are key opportunities to invigorate and enhance the local economy, and will assume its role as a partner in optimizing the benefits of the climate action campaign.

While the SFMTA is committed to internal and transportation sector GHG emission reductions, availability of resources is the critical factor in the prioritization, timelines and the Agency's ability to implement these programs.

In summary, while the SFMTA's internal footprint is being successfully addressed through ever-cleaner transit vehicles, increased energy efficiency and better waste reduction, the direct measure of the SFMTA's contribution to reducing the much larger scope of transportation sector emissions will primarily be found in increased transit ridership, increased use of plug-in passenger vehicles, improved parking management, expanded vehicle technology programs, increased provision of bicycle facilities, promotion of walking and increased transit oriented development.

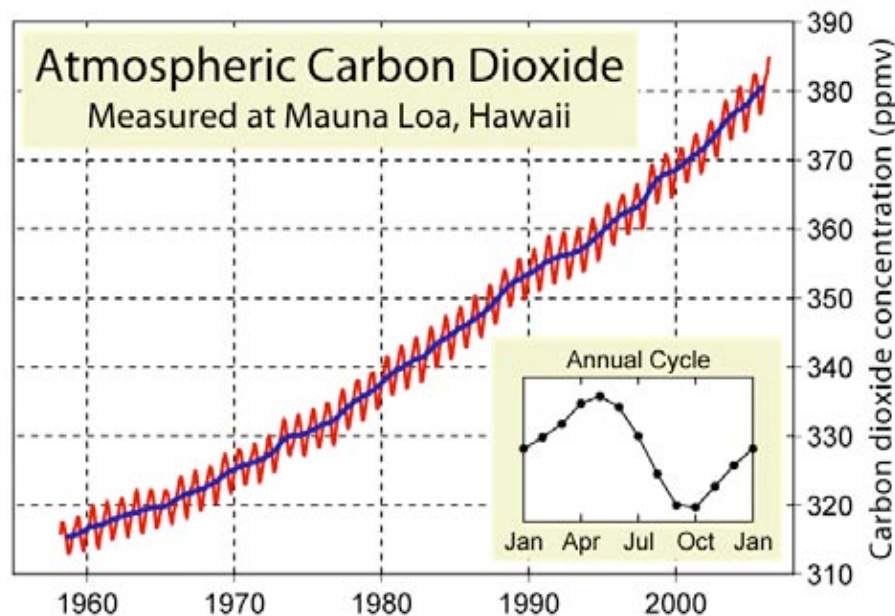
## II. THE THREAT OF CLIMATE CHANGE

### The Science of Climate Change

Climate change is the term for long-term changes in the pattern formed by daily weather. Average temperatures are rising, due to unprecedented, human-generated emissions that create a “greenhouse” layer in the atmosphere, trapping heat. Hence the common term “greenhouse” gases, or GHGs. The term “climate change” describes the consequences of global warming over time.

The principal way humans increase GHGs in the atmosphere is by burning fossil fuels such as coal, natural gas and petroleum, producing carbon dioxide (CO<sub>2</sub>) and accounting for 75 percent of human caused GHGs in the United States. GHG emissions include human and animal contributions. The other primary GHG, methane, is emitted during coal, natural gas and oil production and distribution, by landfills and also from animals such as cows. Other GHGs include nitrogen oxide (NO<sub>x</sub>), fluorinated gases and ozone. The United States has one of the highest levels of per capita GHG emissions in the world and contributes to nearly a quarter of the global emissions problem despite having less than five percent of the world’s population.

CO<sub>2</sub> is removed from the atmosphere when it is absorbed by plants. Oceans can also absorb CO<sub>2</sub> but also turn more acidic, making it difficult for oceanic life to survive. Neither plants nor the oceans can absorb enough of the soaring amounts of human-induced CO<sub>2</sub> to offset global warming. Since 1960, atmospheric CO<sub>2</sub> has increased from less than 320 parts per million (ppm) to over 380 ppm and is rising more than two ppm per year.



Source: The Keeling Curve: Atmospheric CO<sub>2</sub> concentrations as measured at Mauna Loa Observatory

The impacts of climate change are already being felt, from melting glaciers and ice caps in polar regions to stronger hurricanes in the tropics. Over the past fifty years, the average global temperature has risen one degree Fahrenheit. It appears that this temperature rise will accelerate under the status quo.<sup>1</sup> The vast majority of the climate scientific community believes a concerted and coordinated effort must be made to limit global warming to no more than 3.6 degrees F above current levels to avoid the worst impacts of

<sup>1</sup> SF Department of Environment, Climate Action Plan, Section 1.2 Local Impacts of Climate Change, p. 1-6

climate change. To limit global warming to less than 3.6 degrees F, it is believed that atmospheric CO<sub>2</sub> concentrations must not exceed 450-500 ppm,<sup>2</sup> although recent studies argue that the current level of 380 ppm may already be high enough to melt the polar icecaps.<sup>3</sup>

### **The Consequences of Climate Change**

A warmer global climate melts the icecaps, which leads to a rise in sea levels and the inundation of low-lying coastal areas. Climate change can alter precipitation patterns, resulting in less winter snow and spring runoff in some areas and floods and drought in others. Together, these changes influence ecosystems (shore line, silt run off), human health (mosquitoes and other parasites), the economy (tourism, property, health insurance) and infrastructure (flooding, erosion and the rising water table translate to problems with roads, pipelines, transportation, underground cables and sewage systems).

It is projected that in 30 years, average temperatures across North America will rise by 1.8 to 5.4 degrees F. Sea level is rising at a rate of 0.08 to 0.12 inches per year. Some projections indicate that the San Francisco and Oakland airports, as well as some low-lying coastal communities, will be under water by 2100.<sup>4</sup> Other negative impacts may include more intensive droughts and more frequent and intensive fires. California's 2008 fire season, one of the more severe on record, may be a sign of things to come.

In San Francisco, the health of residents may be endangered due to increased air pollution. Increased heat may increase ozone levels and air pollution toxicity, which may intensify respiratory conditions such as asthma.

### **Transportation and Climate Change**

California is second among the states in GHG emissions and contributes approximately seven percent of US GHG. On a per capita basis, however, California actually has one of the lowest GHG emissions among the fifty states – approximately 11 metric tons per person per year compared to over 20 metric tons nationwide<sup>5</sup>. While California's per capita level of GHG emissions compares favorably with several Western European nations and is far below the national average, it still exceeds what is sustainable in order to stabilize the earth's climate. Moreover, California's overall carbon footprint is significant because the state has such a large population (over 36 million) that is rapidly growing (46 million projected by 2025). With less than 0.6 percent of the world's population, California contributes two percent of global, human generated GHG.

While San Francisco's electricity is primarily generated by clean hydroelectric power, more than 50 percent of California's electricity comes from burning fossil fuels (natural gas and coal). Transitioning to solar, wind and other more sustainable forms of electricity generation is necessary to reduce GHG emissions.

Even more significant than electricity generation to the mitigation of climate change is the reduction of emissions from the transportation sector. Burning fossil fuels for transportation is the primary contributor to GHG in California. Thus, reducing automobile usage and making vehicles cleaner are critical to cutting carbon emissions. California leads the nation in vehicle miles traveled and contains many automobile-oriented, low density cities.

San Francisco contributes 9.7 million tons of GHG per year. This exceeds the per capita state average, but nearly half of these emissions come from the transportation sector, and so a large percentage of non-

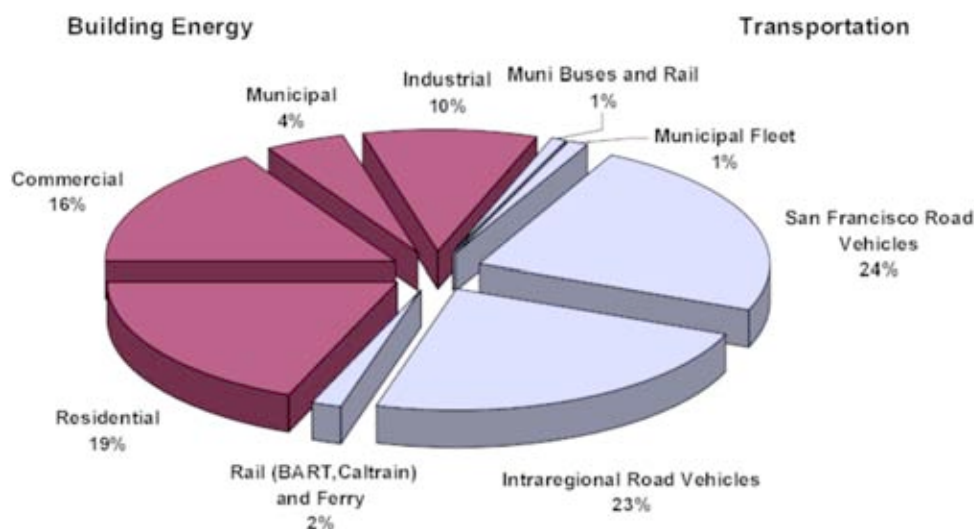
<sup>2</sup> Union of Concerned Scientists, A Target for U.S. Emissions Reductions, [http://www.ucsusa.org/global\\_warming/solutions/big\\_picture\\_solutions/a-target-for-us-emissions.html](http://www.ucsusa.org/global_warming/solutions/big_picture_solutions/a-target-for-us-emissions.html)

<sup>3</sup> Science Daily: <http://www.sciencedaily.com/releases/2008/11/081108155834.htm>

<sup>4</sup> SF Department of Environment, Climate Action Plan, Section 1.2 Sea Level Rise, p. 1-8

<sup>5</sup> Energy Information Administration: <http://www.eia.doe.gov/environment.html>

residential commute emissions are included. Transportation sector emissions in San Francisco, including SFMTA vehicles and all on-road mobile sources, aircraft, marine vessels and trains,<sup>6</sup> rose by 10 percent from 1990 to 2000 (4.6 to 5.1 million tons). Under the status quo, transportation sector emissions are projected to continue to increase to approximately 5.5 million tons in 2012. The breakdown of 1990 GHG emission levels between stationary and mobile sources is shown in the following graph:



Source: *Climate Action Plan for San Francisco, September 2004*

On a per passenger mile basis, the most efficient non-polluting forms of transportation are walking, bicycling and riding the SFMTA's electric vehicles (trolley buses, light rail vehicles, historic streetcars and cable cars). Other forms of public transportation, including BART<sup>7</sup>, Caltrain and Muni's diesel buses,<sup>8</sup> emit substantially less CO<sub>2</sub> per passenger mile than driving (both single-occupant vehicles and carpools); therefore, shifting people from automobiles to more sustainable forms of transportation is essential to combating climate change.

### **The SFMTA's Role in Mitigating Climate Change**

The SFMTA is unique among large transportation organizations in the United States because it manages public transit, bicycling, pedestrians, traffic and parking, and soon taxis. It has an annual operating budget of approximately \$790 million and employs 4,865 people.

San Francisco has been a national leader in the promotion of environmentally-friendly alternatives to the automobile. It was one of only seven cities in the United States that preserved its streetcar network after World War II and remains one of just five cities still operating electric trolley buses. In 1962, the citizens of

<sup>6</sup> This category is further defined as emissions from private vehicles within San Francisco, and between the City and Bay Area, as well as BART, other transit and the City's municipal fleet.

<sup>7</sup> Powering electric vehicles may still result in the emission of CO<sub>2</sub>, depending on how electricity is generated. Electricity for SFMTA's trolley buses, light rail vehicles, historic streetcars and cable cars is primarily generated through hydroelectric power, which does not produce substantial amounts of GHGs.

<sup>8</sup> Muni's diesel buses are all fueled with biodiesel including 86 hybrids. According to National Biodiesel Board and BAE Systems data, this reduces CO<sub>2</sub> emissions by 15 to 25 percent compared to modern, conventional buses fueled with diesel.



San Francisco joined voters in Alameda and Contra Costa Counties in taxing themselves to build the regional Bay Area Rapid Transit District (BART) system. In 1973, the San Francisco Board of Supervisors adopted a *Transit First* policy that made it City policy to prioritize public transit and non-automobile modes in transportation planning decisions.

Today the SFMTA provides approximately 700,000 transit trips on an average weekday, one of the highest in the nation on a per capita basis. According to the 2000 U.S. Census, approximately 50 percent of San Francisco residents use sustainable forms of transportation – walking, bicycling or public transit – for their journey to work. The SFMTA's compact development pattern and comprehensive travel options allow nearly 30 percent of San Francisco households to avoid automobile ownership altogether. Because of the efficiency and high utilization of public transit in San Francisco, the SFMTA manages to transport a large volume of people with a relatively small carbon footprint itself – approximately one percent of total citywide emissions.

The SFMTA operates one of the cleanest transit fleets in the world. More than half of its vehicles are powered by zero GHG emission, hydroelectric power,<sup>9</sup> including light rail trains, historic streetcars, cable cars and electric trolley buses. The SFMTA has also begun to implement its *Clean Air Plan: Zero Emissions 2020*, a blueprint for further reducing motor coach emissions through bridging technologies such as hybrid and fuel cell buses and cleaner fuels such as biodiesel.

San Francisco remains transit-oriented in comparison to the rest of the Bay Area. According to the 2000 Census, 31.1 percent of San Franciscans commuted on transit while another 9.4 percent walked to work. This compares to 6.6 and 2.3 percent, respectively, in the rest of the Bay Area, and even lower shares in the state of California. The San Francisco transit-oriented lifestyle is attributed to the density of transit service, walkable streets, parking management programs and the density and mix of land uses that numerous studies consistently show foster a lifestyle of walking and riding transit. As a result, most projects built in San Francisco comply with widely-accepted land use mix and density standards for TOD in state and national planning guidelines. San Francisco also has the second highest bicycle ridership of cities over 500,000 population in the U.S. with nearly three percent of work trips now made on bikes.

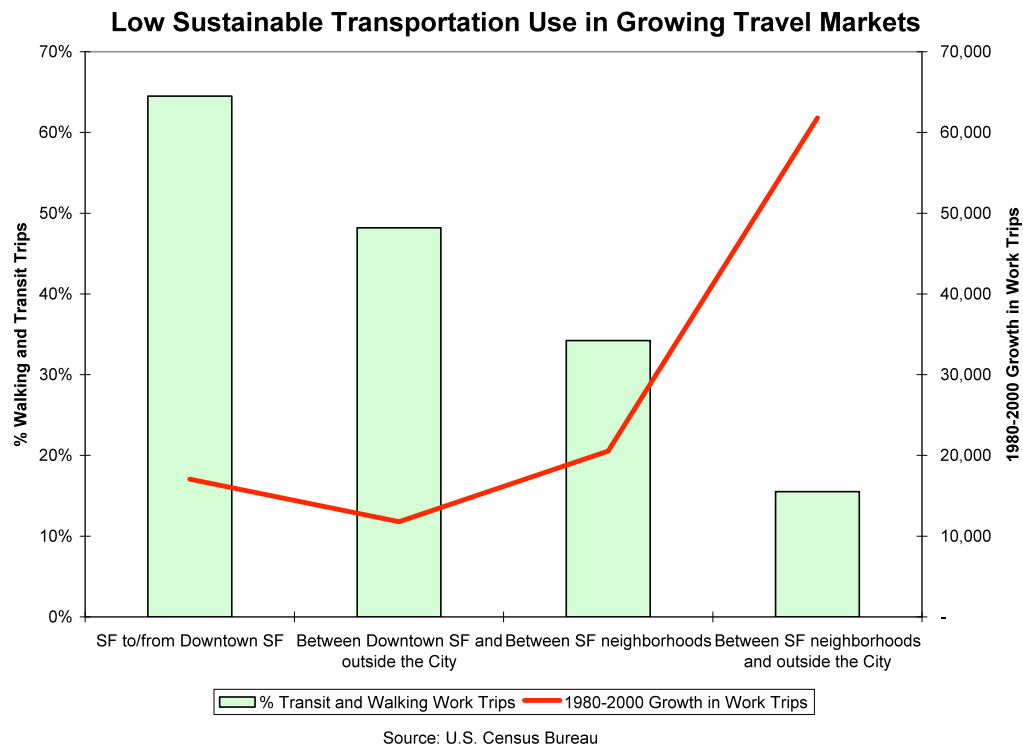
Nevertheless, even in San Francisco, the trend has been away from more sustainable forms of transportation as vehicle ownership has risen and employment and shopping have become more dispersed. In 1960, for example, more than 50 percent of San Francisco commuters took transit or walked to work – about a 10 percent higher share than today. While transit and walking usage for San Franciscans who work in Downtown San Francisco remain high at approximately 65 percent, these modes are much less popular in other travel markets. For example, transit and walking combined capture about 34 percent of work trips between San Francisco neighborhoods.

In particular, the rapidly-growing market segment of work trips between San Francisco neighborhoods and the Bay Area counties surrounding San Francisco has a very low transit and walking mode share – just 15 percent. Currently, approximately 100,000 San Franciscans, one-quarter of the workforce, commute to locations outside of San Francisco. Regional transit trips for San Franciscans are very difficult to serve by transit as they typically involve a longer local ride to a BART or Caltrain station located in the eastern half of the City. The following chart illustrates this fact as well as the shows the growth in regional trips:

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<sup>9</sup> While hydroelectric power produces zero GHG - it still has an ecological impact.





In addition to work trips, addressing carbon emissions in the transportation sector will also require a focus on non-work trips. Only about one third of private trips are work related. When non-work trips are taken into consideration, transit's mode share declines to approximately 15 percent.<sup>10</sup> Non-work trips are generally more discretionary than work trips. They typically occur during non-peak hours, when roads are less congested, parking is more available and transit runs less frequently. Improving transit and other sustainable travel modes to be more competitive for non-work trips merits special attention. It is also important to recognize the distinct advantage that private autos have for non-peak discretionary trips. Therefore, it is essential that these trips do not produce significant GHG emissions—primarily by using plug-in vehicles charged with renewable sources of electricity and convenient re-charging stations.

Given these considerations, several steps must be taken to increase transit, bicycling, walking, ridesharing and cleaner vehicle usage:

- The City should continue to support employment growth in Downtown San Francisco, where transit and walking already have a competitive advantage over the automobile. The City should also provide additional transit capacity to accommodate new ridership on currently overcrowded corridors as well as residential and mixed-use TOD throughout the City.
- Transit must be improved between San Francisco neighborhoods through more frequent and faster cross-town service. As the second-densest city in the country, San Francisco can support high levels of transit service.
- SFMTA transit connections to regional services such as BART, San Mateo County Transit District (SamTrans and Caltrain), Alameda Contra Costa Transit District (AC Transit) and the Golden Gate Bridge, Highway & Transportation District (Golden Gate Transit and Ferry) must be strengthened to facilitate travel to counties surrounding San Francisco.

<sup>10</sup> San Francisco County Transportation Authority model.

- Transit frequency and service hours must be expanded during off-peak times to capture a greater share of off-peak, non-work trips.
- Alternatives to transit and driving alone must be encouraged, including bicycling, walking and ridesharing.
- The use of cleaner vehicles must be encouraged through increased availability of support infrastructure with clean air vehicle parking and charging provisions.
- Promotion of TOD and other vehicle demand reduction strategies.

Land use changes, transportation pricing and the expansion of more sustainable vehicles and driving alternatives are necessities in mitigating climate change. Unless there is immediate and decisive action, the trend towards increased transportation sector GHG emissions will likely accelerate. Interregional vehicle trips are growing faster than regional trips and now make up more than half of transportation sector emissions. Vehicle miles traveled in San Francisco are projected to increase by 13 percent in 2012 over 1990 levels despite the fact that San Francisco residents have one of the lowest vehicle ownership rates in the state.

### **Meeting Challenges with Opportunities**

The SFMTA recognizes that the strategies to address climate change can have profound benefits on the local economies of San Francisco and the Bay Area. Documenting the reduction in emissions accomplished by Climate Action Plan policies helps position the SFMTA as a recipient of funds in the emerging “carbon-trading” markets. In addition, the development of a clean-technology, robust transit network serving a vibrant, compact city enhances San Francisco’s *Transit First* tradition, increases transit ridership and makes San Francisco and the Bay Area a more attractive, competitive place for living, working, study and leisure in three fundamental ways:

- Offering sound, reliable transit alternatives that ensure citywide and regional mobility, saving millions of dollars annually typically lost in traffic congestion
- Stimulating the value of property, in particular TOD, which has shown to maintain higher value and generate higher tax returns than property remote from transit
- Developing a future land-use/transportation infrastructure that preserves and enhances San Francisco’s tradition of healthy, cleaner air from the neighborhood level to the City and region.

The relationship between reducing carbon emissions and stimulating the local and regional economies is both integral and intractable. As a place of innovation, creativity and environmental legacy, San Francisco is better equipped than most cities to face the climate change crisis, and therefore has both the economic opportunity and the civic responsibility to lead the nation in the campaign to reduce carbon emissions.

### **III. THE CHALLENGE: REDUCING GREENHOUSE GAS EMISSIONS**

#### **City of San Francisco Emission Reduction Targets**

The City of San Francisco recognizes the importance of mitigating climate change through the reduction of GHG emissions. In September 2004 San Francisco's Department of Environment (SF Environment), released the citywide Climate Action Plan. In this plan, Mayor Gavin Newsom wrote:

We must act now to significantly reduce greenhouse gas emissions or we will quickly reach a point at which global warming cannot be reversed. That is why San Francisco holds itself accountable for its contributions to global warming, and is committed to dramatically reducing overall greenhouse gas emissions to 20 percent below 1990 levels by 2012.

On April 29, 2008 the San Francisco Board of Supervisors passed and the Mayor signed an ordinance establishing the following GHG emissions targets: (a) 20 percent below 1990 levels by 2012, (b) 25 percent below 1990 levels by 2017, (c) 40 percent below 1990 levels by 2025 and (d) 80 percent below 1990 levels by 2050. These standards are consistent with what leading scientists have stated must be achieved to avoid extreme climate change. They are more aggressive than the Kyoto Protocol, an international treaty sponsored by the United Nations to reduce GHG emissions.<sup>11</sup>

#### **Existing GHG Emissions and Reduction Targets**

<b>Year</b>	<b>City of San Francisco</b>	<b>AB 32</b>	<b>Governor Schwarzenegger's Executive Order S-3-05</b>	<b>Kyoto Protocol</b>
2005	Existing citywide GHG emissions are 5% below 1990 levels			
2012	20% below 1990 levels			7% below 1990 levels
2017	25% below 1990 levels			
2020		20% below 1990 levels		
2025	40% below 1990 levels			
2050	80% below 1990 levels		80% below 1990 levels	

The City's GHG emissions in 2005 were approximately five percent lower than in 1990. However, the share of citywide emissions from the transportation sector has risen. Therefore, achieving the 2012 target of a 20 percent reduction in transportation sector emissions below 1990 levels, as mandated in Proposition A, represents an even greater challenge due to the increased number of passenger cars on the road today.

Meeting the 2012 and subsequent targets therefore requires a greater *per capita* emissions reduction. The Association of Bay Area Governments (ABAG) has recently estimated that the population of San Francisco could reach approximately 815,000 by 2012<sup>12</sup> - an increase of 13 percent over 1990 levels—(See table

<sup>11</sup> As of 2008, 183 parties have ratified the Kyoto Protocol. The United States and Australia have not. San Francisco's 1990 base level is calculated and used in conformance with the international/UN standard.

<sup>12</sup> ABAG's Projections 2007 study estimated San Francisco's population to reach 808,700 in 2010 and 823,800 in 2015.

below for overall population projections). Combining this 13 percent estimated population growth with a requirement to reduce total citywide carbon emissions by 20 percent by 2012 translates into a per capital reduction of about 30 percent.

### San Francisco Job and Population Forecasts

	1990	2000	2005	2010	2015	2020	2025	2030	2035
<b>Jobs</b>									
San Francisco	550,835	579,253	553,090	593,370	636,840	684,310	733,020	782,560	832,860
Change from 1990	-	5%	<1%	8%	16%	24%	33%	42%	51%
SF Bay Region	3,206,100	3,753,460	3,449,640	3,693,920	3,979,200	4,280,700	4,595,170	4,921,680	5,247,780
Change from 1990	-	17%	7%	15%	24%	34%	43%	54%	64%
<b>Population</b>									
San Francisco	723,959	776,733	795,800	808,700	823,800	857,200	888,400	922,600	956,800
Change from 1990	-	7%	10%	12%	14%	18%	23%	27%	32%
SF Bay Region	6,023,577	6,783,762	7,096,100	7,412,500	7,773,000	8,069,700	8,389,600	8,712,800	9,031,500
Change from 1990	-	13%	18%	23%	29%	34%	39%	45%	50%

Source: MTC Commuter Forecasts for the San Francisco Bay Area 1990-2030, ABAG Projections 2007. The San Francisco Bay Region consists of the counties of Alameda, Contra Costa, Marin, Napa, San Francisco, San Mateo, Santa Clara, Solano and Sonoma.

San Francisco's April 29, 2008 ordinance also requires all City departments to assess their GHG emissions. By January 30, 2009 each department must submit a plan on how to achieve the reduction target for the emissions directly under its jurisdiction. In compliance with this requirement, the SFMTA will likely be able to reduce its own GHG emissions 20 percent below 1990 levels by 2012 with initiatives it has already completed and programs currently underway.

The SFMTA's internal footprint is being successfully addressed through ever-cleaner transit vehicles, increased energy efficiency and better waste reduction. The direct measure of the SFMTA's contribution to reducing the much larger scope of transportation sector emissions will primarily be found in increased transit ridership, increased use of plug-in passenger vehicles, improved parking management, expanded vehicle technology programs and increased transit oriented development.

### **Proposition A Transportation Sector Reduction Targets**

The SFMTA has prepared this *2009 Climate Action Plan* in compliance with separate requirements established by Proposition A, which was passed by the voters in November 2007. As noted previously, Proposition A mandates that the SFMTA develop a plan to reach a 20 percent GHG reduction below 1990 levels by 2012 in the transportation sector, not merely in the Agency's internal operations. This target cannot be achieved unless significant incremental funding is secured and dramatic changes are made; under the status quo, 2012 transportation-related emissions could be 20 percent *higher* than in 1990.

### Historical Transportation Sector GHG Emissions and Reduction Targets

Year	Emissions (million tons CO <sub>2</sub> )				
	Road Vehicles	Municipal Fleet	SFMTA Rail and Buses	Other Transit	Total
1990	4.27	0.08	0.09	0.16	4.6
2000	4.62	0.08	0.10	0.26	5.1
2012-Status Quo	5.07	0.08	0.10	0.28	5.5
2012-20% Reduction Target	3.42	0.06	0.07	0.13	3.7
Required Reduction by 2012	-1.65	-0.02	*	*	-1.8

\* Transit service increases to accommodate new ridership may cause transit emissions to increase, but would be offset by much larger decreases in road vehicles emissions.

Achieving the Proposition A GHG target would require an annual transportation sector reduction of 1.8 million tons of CO<sub>2</sub>. Since over 90 percent of transportation-related carbon emissions come from road vehicles, reaching this target must primarily come from a combination of reduction in vehicle miles traveled (VMT) and trips from private automobiles as well as improved fuel efficiency and new vehicle technologies.

Although the SFMTA does not have direct control over private vehicles, its policies and services strongly influence travel choice and thus transportation-related emissions.<sup>13</sup> The SFMTA's primary contribution to the reduction of transportation-related emissions will need to come through shifting people from single-occupancy gasoline cars to transit, ridesharing, cleaner vehicles, walking and bicycling. In particular, increasing the frequency and quality of public transit will be a critical step that potentially will require hundreds of millions of dollars. Adding more service will likely cause the SFMTA's own emissions to increase but will be offset by a much greater decrease in automobile-generated emissions.

While attracting more customers onto transit would have the most significant impact on emissions reductions, the SFMTA must also continue to be an environmental leader by pursuing clean vehicle technologies for its transit and non-revenue vehicle fleet. Trolley buses, light rail vehicles, historic streetcars and cable cars compose over half of the SFMTA's transit fleet and are powered by electricity, a renewable source that can be generated with minimal GHG emissions and at a relatively low cost. In contrast, diesel fuel, which powers conventional and hybrid-electric buses, is a non-renewable resource whose supply will be constrained in the future.<sup>14</sup>

The most effective means to reduce VMT is transit oriented development—building developments within walking or biking distance of jobs and transit. Fortunately many parts of San Francisco already have the density required to be an even more transit and bicycle-oriented city. Even so, for much of San Francisco, especially the southern and western portions, major land use changes will require many years or decades to implement, and existing land use patterns are unlikely to change in time to meet carbon emission reduction goals. Therefore, for these areas, as for most moderate and low density development in California, the most immediate means to meet carbon emission standards is conversion to plug-in vehicles.

In addition to contributing to the climate change problem, continued reliance on fossil fuels will place the United States increasingly at risk both financially and with regards to national security. The U.S. consumes

<sup>13</sup> In turn, the SFMTA's policies and services are strongly influenced by regional, state and national policies and funding priorities that are beyond the SFMTA's control. These may include, for example, CAFÉ (fuel economy) standards and funding for mass transit expansion.

<sup>14</sup> The SFMTA uses B20 – a blend of 80 percent diesel fuel with 20 percent biodiesel. B20 starts to address the fossil fuel problem by reducing GHG emissions by more than 15 percent relative to pure diesel.

25 percent of the world's oil but has only two percent of its reserves. The dramatic escalation in fuel prices during the first half of 2008 had severe economic consequences on transit systems across the United States, even during a time of record ridership and increased revenues from fares.



#### **IV. MEASURE OF PLAN AND PROGRAM SUCCESS**

In the SF Department of Environment's 2004 Climate Action Plan, the SFMTA's GHG emissions were projected to increase slightly by 2012. However, this was due to trending and based on larger than normal fleet counts during vehicle replacement at that time. In 2008 the SFMTA's GHG emissions appear to be well on target for 20 percent reduction goals in 2012.

In contrast, San Francisco transportation sector emissions are projected to increase by 0.40 million tons in 2012 due to an increasing number of private VMTs.

This section provides definitions and details regarding how the SFMTA will measure climate action progress, as well as discuss present hurdles to quantifying these results.

##### **Agency Targets and Goals**

As discussed, there are essentially two areas of reduction to consider, agency footprint reduction and transportation sector reductions. For the Agency, the City's municipal goal of 20 percent reduction is very realistic, due to replacement of older buses, addition of hybrid buses and use of biodiesel, so stabilization is the ultimate goal. Reduction to minimum is the interim goal. For the transportation sector, the goal is a 20 percent reduction of 1990 emissions by 2012. In order to reach this level of reduction, transit service would essentially need to be doubled, the private vehicles still in use would need to be converted to technologies such as plug-ins and other sustainable modes like walking and bicycling would need to be expanded.

##### **Progress indicators**

###### Operations

- Increased transit ridership
- Reduce private VMTs
- Reduce need for off-street parking
- Convert on-street parking to transit, bicycle and pedestrian uses
- Generate more efficient use of roadways, reduced road maintenance, shorter highway commute times<sup>15</sup>

###### Vehicles

- Reduce transit fleet vehicle emissions to zero
- Increase number of green vehicle registrations

###### Facilities

- Increase energy efficiency and renewable energy
- Provide infrastructure to support transit and non-transit electric vehicles

###### Solid Waste and Recycling

- Optimize waste reduction

###### Employee Commute

- Reduce total VMTs

###### Construction and Capital Projects

- Divert tons of C&D waste from landfills

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<sup>15</sup> This can be measured based on the Congestion Management assessment performed by the Transportation Authority for all major arterials every year.

The SFMTA will use the following conversion factors and definitions for the collection of energy and fuel data and for calculating associated CO<sub>2</sub>e<sup>16</sup> emissions.

For Electricity Use:

- Emissions factor for electricity = 33.1 lbs CO<sub>2</sub>e /mWh (0.031 lbs/KWh)
- Emissions factor for natural gas = 11.70 lbs CO<sub>2</sub>e /therm

Every year the SFMTA will receive an Energy Usage Report from SFPUC detailing the energy usage from agency buildings and facilities. This chart lists budgeted, actual and variance electricity and natural gas usage. Since One South Van Ness and 875 Stevenson are operated by the Real Estate Department, the SFMTA will not include this energy use as part of the agency calculation. The Real Estate Department is responsible for managing their buildings.

For Fuel Use:

- Biodiesel (B20) = 21.48 lbs CO<sub>2</sub>e /gallon
- Gasoline = 19.42 lbs CO<sub>2</sub>e /gallon
- CNG 11.7 lbs CO<sub>2</sub>e/therm

### **SFMTA's Baseline 1990 Energy Use**

First, a common and agreed upon database and fleet measurement system are needed. For the SFMTA's 1990 baseline, the SF Department of Environment and Public Utilities Commission (PUC) used the measure of vehicular travel in terms of gallons of fuel. In cases where specific historical or forecast data was not available, estimates were made by extrapolating from existing data. The SFMTA's baseline data appear to be too low at 4.6 million gallons for diesel fuel alone; documents show 5.6 million gallons of fuel used in 1990.

Looking just at the primary contributor to SFMTA GHG emissions - diesel fuel used in buses - in the baseline year of 1990, Muni used 5.6 million gallons of diesel according to agency statistics. In FY 2007/08 the SFMTA used 4.8 million gallons of diesel fuel. Muni's bus fleet has increased by 17 buses in 1999. There have also been many service changes made in the past 18 years that may also account for some differences between current and baseline fuel use. The addition of hybrid buses has raised fuel economy, while the use of biodiesel and PM+NO<sub>x</sub> reduction devices on all non-hybrid buses may have slightly decreased fuel economy (although fuel-lifecycle CO<sub>2</sub> reductions from biodiesel of up to 17 percent outweigh pure fuel economy indicators).

The 1999 service and fleet expansion issue is an excellent example of the problem in measuring the the SFMTA baseline GHG emissions. The SFMTA should be accountable for internal and vehicle-average reductions and the reduction in citywide VMT, while not being penalized for service expansion and its correlated fuel use.

### **Transportation Sector Challenges and Opportunities**

Well over 60 percent of mobile source GHG emissions come from cars and light trucks, 15 percent come from other highway vehicles, 12 percent come from airplanes and three percent come from marine vehicles. Locomotives and other mobile vehicles make up the rest.

An average private vehicle emits about one pound of GHG emissions per mile. The growth in transportation sector emissions is primarily the result of increased emissions from SUVs and light duty trucks. CO<sub>2</sub>

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<sup>16</sup> eCO<sub>2</sub> captures all green house gas emissions reduced to their carbon dioxide *equivalents*.

emissions from automobiles increased only 1.8 percent from 1990 to 2004 while emissions from trucks and light duty vehicles increase 64 percent during the same time.

Federal fuel economy standards for auto manufacturers do not adequately deal with the rising emissions from increased vehicle miles traveled (VMT). If the growth rate of VMTs continues at historical rates, transportation sector GHG emissions will not decline. Further, this growth has increased transportation sector loads, leading to more total daily delay hours spent in traffic congestion and making efficient surface level public transit even more challenging. Every transit passenger mile reduces total VMTs by four miles.

### **The SFMTA's Inversely Proportional Role in Reducing Citywide CO<sub>2</sub>**

As more people are attracted to public transit, the SFMTA's emissions footprint also increases, although at a much smaller rate. In total, GHG emissions from the transportation sector can be significantly reduced by converting private VMTs to transit passenger miles.

A solo motorist switching his/her commute to public transportation can reduce GHG emissions by 20 pounds per day or almost 2.5 tons annually. The savings when that driver switches from an SUV to transit grows to almost four tons per year. This compares to reducing about 335 pounds of GHG per year by replacing an old refrigerator. Converting from daily private vehicle use to the use of public transit can reduce an average household's GHG emissions footprint by 25 to 30 percent per year. For two-car households, more than half of GHG emissions can be private vehicle related. In other words, two-car households could reduce their GHG footprint by about one third annually for every car they replace with public transit.

There may also be a large contribution from local employers, such as Yahoo and Google, already using rideshare and/or private bus fleets for their employee commutes to and from San Francisco. This contribution must also be considered as these programs are improved through parking agreements and other policies.

The challenge for the SFMTA is to attract more customers through more efficient and better service, while being able to measure GHG emissions reduction success in terms of its own footprint and VMT reductions that are more indicative of citywide reductions.

### **Tracking Progress**

The SFMTA will track and present climate action progress using the following chart:

Action #	Issue/Element	Target: G, B, R*	Status
Transportation			
Clean Fuels & Vehicles			
Pedestrian			
Bicycling			
Walking			
Policy and Leadership			
Transit Fleet			

Target: Government, Business, Residential

One measurement and outreach tool may be an online CO<sub>2</sub> emissions map system. This system would use SFMTA-specific metrics for the goal of calculating carbon emissions that are associated with transit trips. Many other data sets could be useful as well - from simple metrics like daily ridership to figuring out the effect of transit on TOD. Data presented online in this way may reflect well on the SFMTA and help build ridership, since the public could understand and better visualize the emissions savings. This model can also demonstrate that a better indicator of transit-related emissions is the difference that additional transit customers make, rather than pure vehicle based emission footprints.

Mobile sources are responsible for about half of citywide GHG emissions. However, it must be emphasized and understood that public transit cannot reduce all transportation sector emissions. Ignoring the issues associated with extreme public transit growth, roughly 30 percent is the maximum citywide GHG reduction possible if all private vehicle trips were replaced with transit rides. The remaining 20 percent citywide GHG emissions from the transportation sector would still be present in heavy trucks, trains, airplanes, marine vessels and from public transit itself.

**V. EXISTING CLIMATE CHANGE MITIGATION MEASURES AND INTERNAL FOOTPRINT**

The SFMTA is well on target to meet the City's goal of reducing departmental GHG emissions by 20 percent in 2012.

One of the largest contributors to the SFMTA's GHG emissions footprint is fuel use. In 1990, the baseline year for citywide reduction goals, the SFMTA used 5.6 million gallons of diesel fuel. In the first full year of hybrid bus service, FY 2007/08, the SFMTA used 4.8 million gallons of fuel, a reduction of 14 percent. Further, the Agency operates on biodiesel (B20) which in itself reduces lifecycle GHG emissions by over 15 percent.

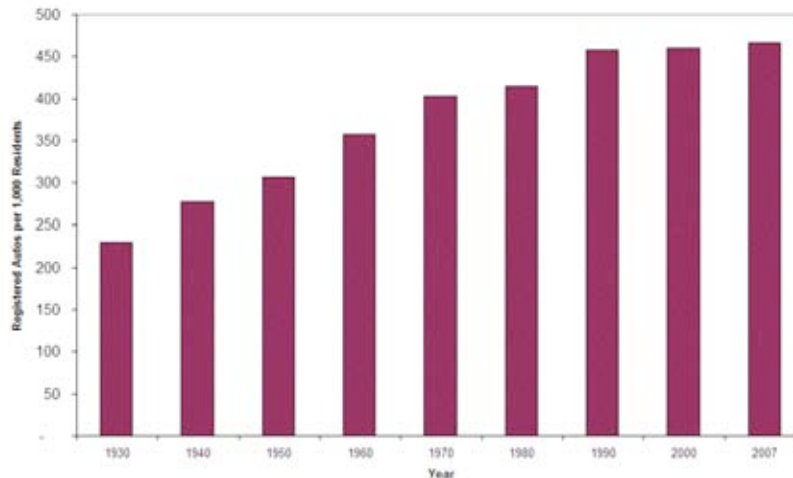
The following sections detail existing internal climate change work in the areas of the transportation sector, transit and non-revenue vehicles, facilities and infrastructure, solid waste and recycling, employee commutes and capital projects.

**A. Transportation Sector****Transit**

Since 1990 Bay Area transit systems have expanded transit options to improve travel to and within San Francisco. In particular, the SFMTA and the San Francisco Municipal Railway have undertaken the following major infrastructure projects:

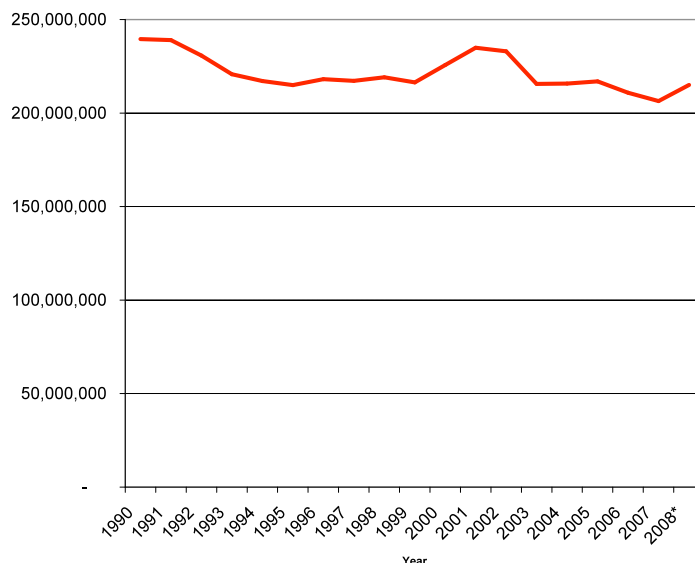
- J Church light rail line was extended from Church & 30<sup>th</sup> to Balboa Park (1993);
- The 31 Balboa route was converted from diesel buses to electric trolley coach service (1994);
- The F Market historic streetcar line opened from the Castro to the Transbay Terminal (1995), and was later extended to Fisherman's Wharf (2000);
- The N Judah light rail line was extended from the Embarcadero Station to the Caltrain Station in the South-of-Market area (1998);
- The T Third light rail line opened to Visitacion Valley (2007);
- The Metro East Light Rail Maintenance and Operations Facility (Muni Metro East) opened, providing additional space to support SFMTA's growing light rail fleet and system extensions (2008);
- The Central Subway, which would bring the T Third line from South-of-Market to Downtown, Union Square and Chinatown, will soon begin construction with completion scheduled for 2017.

Regional providers have also improved transit connections between San Francisco and other parts of the Bay Area. For example, BART has opened extensions from Bay Fair to Dublin/Pleasanton, from Concord to Pittsburg/Bay Point and from Daly City to the San Francisco International Airport and Millbrae. Caltrain has implemented Baby Bullet express service that has shortened travel time between San Francisco and San Jose to less than one hour on selected trips. Both rail services are recording record ridership.

**Per Capita Auto Ownership in San Francisco**


After more than half a century of a steady climb, automobile ownership (autos, trucks, trailers and motorcycles) rates in San Francisco – already one of the lowest in the nation – appear to have leveled off at approximately 470 registered automobiles per 1,000 residents. Saturation of the road network, limited parking, the costs of ownership and investments in transit infrastructure have likely contributed to this trend.

Despite these positive trends, SFMTA transit ridership is lower now than in 1990, which has contributed to higher transportation sector GHG emissions. A likely factor in this ridership loss has been the continued decentralization of the Bay Area, including the proliferation of Peninsula and Silicon Valley jobs held by San Franciscans. In addition, the SFMTA and its predecessor organization have faced many financial challenges since 1990. In August 2005, in order to achieve a net savings of \$3.5 million to balance the budget, SFMTA reduced service on over 30 routes either by lengthening the wait between vehicles, shortening hours of operation or eliminating route segments.

**Annual SFMTA Transit Ridership, 1990-present**


\*2008 ridership is projected based on data from January-July 2008.



*The Transit Effectiveness Project*

The TEP is the first comprehensive effort in over 25 years to review Muni service and to recommend ways to transform it into a faster, more reliable and more efficient public transit system for San Francisco. Launched in May 2006, the TEP has gathered an unprecedented level of ridership data, studied best practices from other transit systems and conducted extensive public outreach to community stakeholders, policy makers and SFMTA employees.

Informed by these efforts, the TEP developed a set of preliminary proposals designed to improve reliability, reduce travel delay and update routes to better meet current and projected travel patterns throughout the City. In spring 2008 TEP draft recommendations were reviewed with a broad cross-section of stakeholders through a series of 11 citywide workshops and over 100 briefings to community groups, SFMTA employees, elected officials, fellow City agencies and other interested stakeholders. After refining the proposals to incorporate valuable feedback, the SFMTA's Board of Directors endorsed the TEP recommendations in October 2008. Route changes may be implemented as early as July 2009, following any requisite environmental assessments.

Muni faces many challenges including changing travel patterns, increasing costs and operational and physical constraints that affect on-time performance. The TEP has developed both an operating budget neutral and enhanced plan to reduce vehicle miles travelled (VMT) by improving service efficiency, transit connections and service frequency. Under the operating budget neutral plan, enhancements along Rapid and other selected routes are balanced out by service reductions elsewhere. While no additional operating funding would be required, this base TEP scenario will still require approximately \$200 million in capital improvements.

The TEP has proposed four route categories with different service characteristics, illustrated in the map below:

- Rapid (red) – Carrying approximately 75 percent of current ridership, these routes would offer the fastest service and highest capacity. Vehicles would operate every five to 10 minutes during the day and every 10 to 20 minutes during the evening.
- Local (green) – Supplementing the Rapid routes to form the core transit network, local routes would generally operate every 10 to 20 minutes during the day and every 20 to 30 minutes during the evening.
- Community Connectors (yellow) – Filling gaps in coverage, particularly in the hilly areas, community circulators would operate every 15 to 30 minutes during the day and every 30 minutes during the evening (some routes would not operate past 9 p.m.).
- Specialized Services (blue) – These routes would address focused needs, which include peak-period express routes and service to regional transit.

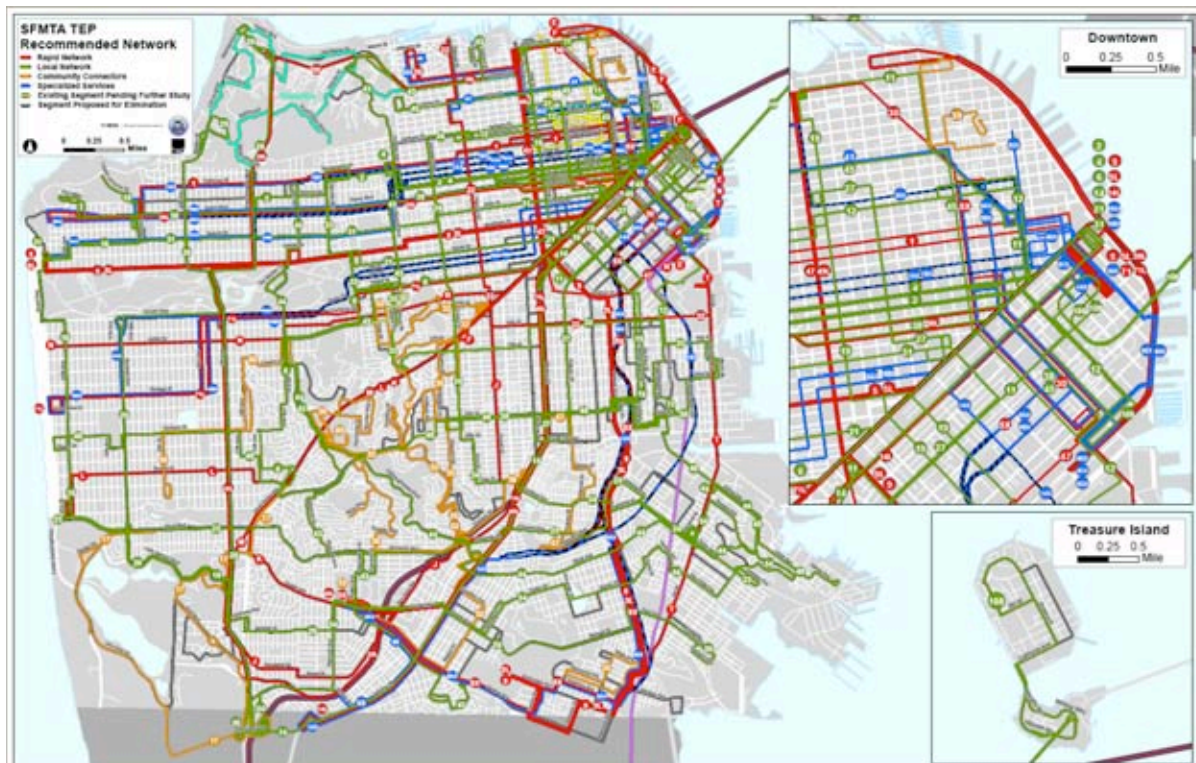
The TEP operating budget neutral scenario, which assumes a reorganized route structure but no net service increase, could raise weekday ridership by an additional 72,000, or nine percent, over 2015 baseline levels. The TEP enhanced scenario, which represents a net 25 percent service growth, could increase weekday ridership by 132,000, or 14 percent, over 2015 baseline levels.<sup>17</sup> Conservatively, this represents a modal shift towards transit of approximately one to two percentage points.

The SFMTA will also be reviewing the transit system route-by-route to identify physical changes that could speed up service and improve reliability. Improvements may include dedicated bus lanes, bus bulbs to speed loading, signal prioritization and stop consolidation or relocation. Faster service would potentially

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<sup>17</sup> Systemwide ridership is projected to increase due to the concentration of resources on high-ridership routes; however, ridership may decrease in areas or times of day when service is eliminated, frequency is reduced or hours of operation are shortened.

allow the SFMTA to reduce the number of vehicles assigned to certain routes and redeploy these resources elsewhere in the network.



### Next Bus

The NextBus information system provides actual, real time arrival information for transit riders, updated at regular intervals. NextBus uses satellite technology and advanced computer modeling to track vehicles on their routes. Each vehicle is fitted with a satellite tracking system. Taking into account the actual position of the buses, intended stops and typical traffic patterns, NextBus can estimate vehicle arrivals with a high degree of accuracy. This estimate is updated constantly. The predictions are then made available on the World Wide Web and to wireless devices including electronic signs at bus stops and internet capable cell phones, Palm Pilots and other Personal Digital Assistants (PDAs).<sup>18</sup>

### Signal Priority Project

Giving transit priority over other vehicles at signalized locations recognizes Muni's need for greater efficiency in the use of roadway space. With the SFMTA's new advanced traffic signal system, improved priority for transit can be given in signal timing. A green light can minimize delays and restrictions caused by other traffic sharing the same roadway as transit vehicles. Transit priority helps Muni improve on-time performance and reliability and increases Muni's modal share of the travel market by decreasing travel times. Transit signal priority can be applied along transit preferential streets and other streets to help them run more efficiently. Application of transit signal priority has been implemented extensively on the Third Street Light Rail Line, Mission Street and Geary Street and is being studied for implementation along other prioritized transit corridors.

<sup>18</sup> NextBus: <http://www.nextbus.com/corporate/works/index.htm>

## Regional Transit Connections and Commuter Resources:

### SFMTA Customer Service Center

The SFMTA Customer Service Center is located at 11 South Van Ness Avenue near Market Street in San Francisco. Customers can pay parking citations, attend tow and citation hearings, obtain parking permits and purchase Muni passes and parking meter cards.

### TransLink®

The TransLink card is designed to make the daily transit commute easy, convenient and secure. Currently available on AC Transit, Dumbarton Express and Golden Gate Transit buses and ferries, the TransLink card will ultimately be available on all transit systems in the nine-county Bay Area. The TransLink card keeps track of card value and automatically deducts the correct fare (including transfers and discounts).

The TransLink card allows customers to:

- Stop carrying multiple forms of payment (exact change, tickets or passes);
- Automatically add value when balance is low with Autoload;
- Replace registered cards and restore the card's balance for a small fee in the event of card loss, theft or damage;
- Board the bus, train or ferry faster.<sup>19</sup>

### 311

The San Francisco 311 Customer Service Center is the primary point of contact for City and County of San Francisco government general services. The 311 Customer Service Center provides a prompt, courteous and professional customer service 24 hours a day to San Francisco residents, visitors and businesses seeking general information and services from the City. 311 serves provides one-stop-shopping for information and service requests. The service center continually integrates updated information from across City government and enables improved government service delivery through performance reporting and analysis. In addition, the service center supports emergency response for the government and community through information and communications. A service request number is provided to the caller so that the status of their request can be tracked and updated. 311 customer services include: addressing transit and streetscape related requests such as information on Muni route information; Muni complaints and compliments; Muni lost and found; taxi lost and found; pothole repair; illegal signs; street cleaning; illegal dumping; sidewalk defects; and broken newspaper racks.<sup>20</sup>

### 511

511 is a free phone and Web service that consolidates Bay Area transportation information into a one-stop resource. 511 provides up-to-the-minute information on traffic conditions, incidents and driving times, schedule, route and fare information for the Bay Area's public transportation services, instant carpool and vanpool referrals, bicycling information and more. It is available 24 hours a day, 7 days a week. 511 provides information for the following transit agencies: Muni, AC Transit, Golden Gate Transit, Caltrain, Valley Transit Authority, BART, SamTrans and paratransit services. The 511 phone service is available in the nine Bay Area counties of San Francisco, Alameda, Napa, Santa Clara, Contra Costa, Solano, Marin, San Mateo and Sonoma.<sup>21</sup>

<sup>19</sup>TransLink: <https://www.translink.org/TranslinkWeb/whatsTranslink.do>

<sup>20</sup>About 311: [http://www.sfgov.org/site/sf311\\_index.asp?id=66008](http://www.sfgov.org/site/sf311_index.asp?id=66008)

<sup>21</sup>511 S.F. Bay Area Overview: [http://www.511.org/global\\_items/global\\_info.asp](http://www.511.org/global_items/global_info.asp)

### SFgo

SFgo is the City's new Integrated Transportation Management System led by the SFMTA's Division of Parking and Traffic (DPT). Phases of the project will be implemented over the next several years to make the City's streets more effective and safer through the use of proven technologies and strategies. Travelers can expect signals that respond to the actual volume of traffic on a roadway, faster response by City personnel clearing an incident, real-time information on travel conditions and improved coordination between all modes of transportation. The program complements San Francisco's *Transit First* Policy by helping to preserve and enhance the City's alternate modes of transportation. There are several initiatives in use or under development that will be able to use the SFgo system:

- Communications System Infrastructure: expansion of fiber optic network
- Transit Signal Priority: Giving transit priority over cars at signalized locations
- Bicycle and Pedestrian Improvements: monitoring street congestion and traffic
- Real-Time Traveler Information: Sharing traffic information with the public
- Special Events and Incident Management: Monitoring changes to traffic conditions
- Emergency Management: Developing emergency response plans
- Parking Guidance System: Operating variable message signs to assist drivers<sup>22</sup>

### Supplemental Transit Services

The SFMTA works with many private and non-SFMTA shuttles to help provide service between major hubs. These include San Francisco State University shuttles and Bauer limousine buses.

### Bicycling

The mission of the San Francisco Bicycle Program is to provide objective and professional service to improve and enhance bicycling as a safe, viable transportation option. The SFMTA does this through planning, engineering, implementing bicycle facilities and educating the community and agencies about bicycle transportation and safety.

The vision of the Bicycle Program is to make San Francisco the North American city with the highest per-capita bicycle use and to have a continually improving bicycle network that is safe and convenient for everyone who chooses to bicycle for transportation and recreation. The number of people who commute to work by bicycle in San Francisco doubled between 1990 and 2000 and continues to grow. Citywide bicycle counts showed further significant increases in bicycle traffic in 2006 and 2007.

The Bicycle Program takes an active role in educating cyclists how to ride safely on City streets. The Bicycle Program strives to promote safe and secure bicycle parking to complement the growing bicycle network. The Bicycle Program has successfully implemented many projects, including striping over 40 miles of bicycle lanes, creating 23 miles of bicycle paths, posting 82 miles of signed bicycle routes and painting 1,250 shared lane markings known as sharrows.

There are approximately 62 projects in the SF Bicycle Plan Environmental Impact Report that is currently underway, including:

- Bike lanes
- Shared pavement arrows
- Wide right lanes
- Bike paths
- Special signal design/detection/timing for bikes
- Informational brochures

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<sup>22</sup> SFgo overview: <http://www.sfmta.com/cms/ogo/indxsfgo.htm>



*Bicycles on buses:*

Bike racks, capable of holding two bicycles, are installed on all SFMTA buses.

*Bicycle parking:*

Seventeen SFMTA parking garages currently provide bicycle parking. There are bicycle storage lockers at six of the garages. Parking at bicycle racks is free of charge, while there is an annual charge of \$75 to rent the bicycle lockers.

**Pedestrian Program**

The SFMTA's Pedestrian Program's mission is to promote walking as a sustainable and healthy mode of transportation and to reduce pedestrian collisions in San Francisco. Current pedestrian program projects focus on safety, accessibility and convenience. Many pedestrian program projects are funded through the Proposition K half-cent sales tax for transportation improvements, approved by voters in 2003. Key pedestrian projects include:

**Better Streets Plan**

The Better Streets Plan will create a unified set of standards, guidelines and implementation strategies to govern how the City designs, builds and maintains its pedestrian environment. The Better Streets Plan brings together staff of multiple City agencies to comprehensively plan for streets. The Plan will seek to balance the needs of all street users, with a particular focus on the pedestrian environment and how streets can be used as public space. The plan will reflect the understanding that the pedestrian environment is about much more than just transportation. Streets serve a multitude of social, recreational and ecological needs that must be considered when deciding on the most appropriate design. The Better Streets Plan will carry out the intent of San Francisco's Better Streets Policy adopted by the Board of Supervisors on February 6, 2006.

**Pedestrian Traffic Signals**

The SFMTA has installed many pedestrian traffic signals and has an ongoing, prioritized plan for upgrading signals. A pilot program to test the effectiveness of pedestrian countdown signals was conducted in 2001 at 14 intersections and the results were very positive. Moreover, public surveys found that pedestrians were very supportive of the countdown devices because they provided clearer information on the amount of time left to cross the street safely. As of November 2008 there were 755 intersections with countdown signals in the City for all crossings, 179 intersections with countdowns for some crossings, 179 intersections with no countdown signals and 50 intersections with upcoming projects that will include installing new countdown signals for all crossings. The countdown signals have been shown to reduce pedestrian collision by 25 percent.

**Accessible Pedestrian Signals**

Accessible Pedestrian Signals (APS) provide a pedestrian pushbutton that communicates when to cross the street in a non-visual manner, such as audible tones, speech messages and vibrating surfaces. Currently, 54 intersections across the City have APS devices. The SFMTA is designing APS devices for another 60 intersections and will continue expanding this program in years to come.

### Golden Gate Park Pedestrian Improvements

The Pedestrian Improvements Study was part of the overall Transportation Improvement Plan (TIP) called for by the Concourse Authority under Section 8 of Proposition J, the 1998 voter-passed Golden Gate Park Revitalization Act of 1998. The study provides a framework for pedestrian access and circulation improvements in the park for the next several years. The study outlines planning criteria with goals and objectives for pedestrian improvements consistent with the adopted Golden Gate Park Master Plan (July 9, 1998). Based on the planning criteria, input from the Recreation and Park Department staff, DPT site observations and identified safety issues the Study suggests specific projects to be considered for implementation.

Following public review and input, a Final Pedestrian Improvements Implementation Plan was approved by the Concourse Authority and Recreation and Park Commission. The Implementation Plan focuses on high priority, short-range and medium-range projects that are more promising for funding and implementation. The Concourse Authority will work with City departments to prepare grant applications for funding the highest priority actions. Implementation of the improvement measures would use a combination of private and public money, using private funds to leverage public matching grants. An application for Regional Bicycle and Pedestrian Program (RBPP) funds to implement selected projects was approved in 2008 by the SFCTA.

### School Safety

The SFMTA continues to apply for and implement federal and state grants to upgrade school area warning signs and pavement striping, to construct traffic calming devices and to work with schools on a comprehensive approach to increasing traffic safety. Specific projects include: upgrading school crosswalks to yellow, ladder-style crosswalks, replacing traditional yellow warning signs with fluorescent yellow-green warning signs, Safe Routes to Schools projects at Flynn Elementary, San Francisco Community Alternative School & Monroe Elementary, Marshall Elementary, and Buena Vista Elementary and grants from the California Office of Traffic Safety. The SFMTA also:

- Responds to traffic and pedestrian safety concerns related to schools
- Evaluates intersections for adult school crossing guards
- Coordinates the approval and installation of school bus and passenger loading (white) zones;
- Works with individual schools to develop traffic circulation plans
- Coordinates with San Francisco Unified School District and other City departments on multi-jurisdictional issues

### Parking Authority

The SFMTA Parking Authority operates 20 parking garages with approximately 14,296 parking spaces, as well as 20 metered off-street parking lots throughout the City. Most garages and lots are located in retail areas and are designed and priced to primarily serve the short-term parking needs of shoppers. In order to help reduce transportation sector emissions, many garages provide electric vehicle chargers, reduced rates for carpool parking, free bicycle parking spaces, reduced rate motorcycle parking and carshare parking spaces. Bicycle parking has been covered in the previous section, while the other programs are described below.

### Electric Vehicle Chargers

Twelve of the twenty SFMTA parking garages provide electric vehicle chargers. Each garage has one inductive and one conductive charger. While charging is free, patrons must still pay posted parking rates. Usage varies from daily at some facilities to never at others. The latest industry development is in standardizing EV chargers so that all chargers work on all future vehicle makes and models. Standard voltage will be 220.



### Reduced Rate Carpool Parking

As an incentive to encourage ridesharing, 17 of the 20 SFMTA-operated parking garages provide reduced monthly parking rates for carpools. Vehicles must have at least three persons per car at all times to qualify for the carpool rate. Monthly carpool rates are generally about half the regular monthly parking rate. For example, at the Union Square and Sutter-Stockton Garages, the regular rate is \$375 per month, while the carpool rate is \$185 per month. There are currently 140 carpools taking advantage of the monthly carpool rate citywide.

### Motorcycle Parking

Motorcycles can be a more fuel efficient alternative to passenger cars. Reduced-rate motorcycle parking is provided at eight of the 20 SFMTA operated parking garages. This is an early model for potential green vehicle parking incentives. Motorcycle parking rates are generally about 20 percent of the long-term parking rates for automobiles. For example, the flat rate for motorcycle parking in the Fifth and Mission Garage is \$5 per day, compared to \$25 for automobile parking for seven to 12 hours. Monthly parking rates for motorcycles at the Fifth and Mission Garage are \$70 compared to a regular monthly rate of \$300 for autos.

### Carshare Parking

Carsharing allows people to forego auto ownership in favor of having access to a shared car for those occasions when they need a car. Four garages currently provide reduced rate parking for carshare vehicles: Fifth/Mission, Golden Gateway, Performing Arts and Vallejo Street. Monthly rates for carshare vehicles are generally about half the regular monthly rate. There are currently 34 carshare vehicles using the garages.

### **B. Transit and Non-Revenue Vehicle Fleets**

The most significant way that the SFMTA helps to reduce pollution is by providing safe, reliable public transportation service. The SFMTA also demonstrates its commitment to clean air by operating low-pollution vehicles. The SFMTA currently has the lowest per-passenger emissions of any transit agency in California, and the goal is zero emissions by 2020.

Presently, the SFMTA operates:

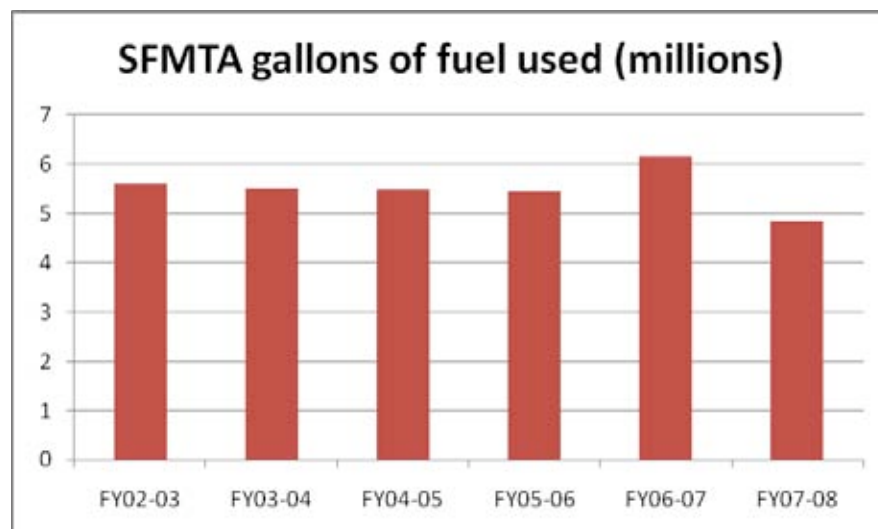
- Largest zero emissions bus fleet in the country and the second largest alternative fuel bus fleet in California (331 electric trolley buses)
- Largest municipal B20 biodiesel transit fleet in the country (587 vehicles including non-revenue)
- Third largest hybrid bus fleet in the country (86 buses)

Fifty-one percent of the SFMTA's 1,045 transit vehicles are zero emission (light rail, historic streetcars, electric trolley buses and cable cars). Forty percent of the SFMTA's 842 buses are zero emissions (electric trolley buses). All of the remaining transit buses are fueled with biodiesel, including hybrid buses. Additionally, 35 paratransit vehicles are fueled with biodiesel.

The electricity on which the zero emission vehicles run is generated by the City's hydroelectric power plant, a non-polluting source of renewable energy.

### **Footprint**

The SFMTA used 4.84 million gallons of fuel in FY 2007/08 to fuel revenue vehicles. This compares to an average of 5.63 million gallons for the previous five years. This represents a 14 percent reduction in recent fuel use, primarily due to the introduction of fuel efficient hybrid buses; but it's important to note that it's also *despite* the slightly increased fuel use introduced by PM+NOx reduction devices,<sup>23</sup> and the slightly lower fuel economy resulting from the use of a 20 percent biodiesel blend fleetwide.<sup>24</sup>



<sup>23</sup> Cleaire Longview PM+NOx reduction devices tap into the engine's fuel system to inject small amount of fuel into the catalytic chamber to reduce NOx emissions.

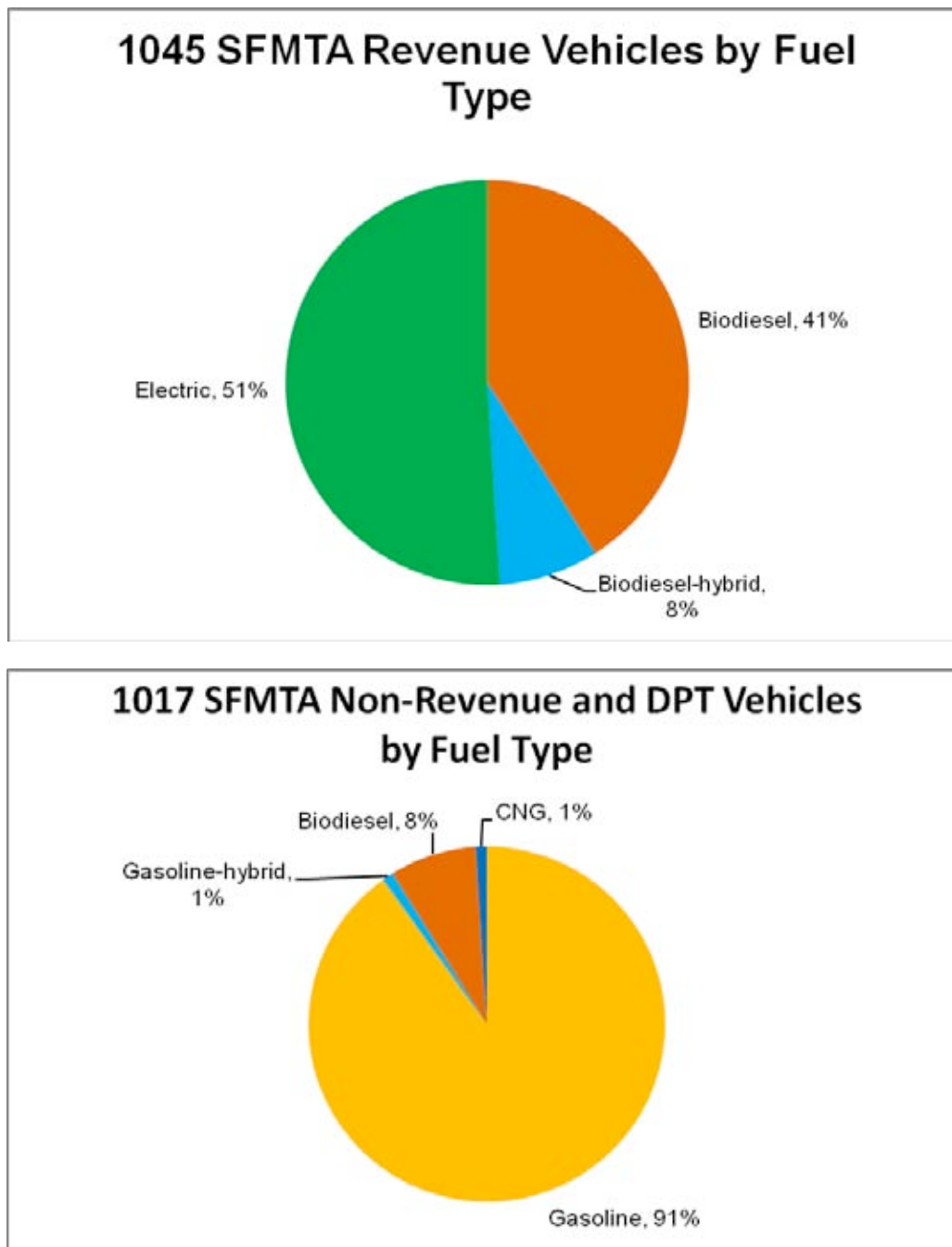
<sup>24</sup> Biodiesel has a slightly lower energy (BTU) content compared to conventional diesel.



*The SFMTA operates four types of zero-emission vehicles, consisting of more than half of the Muni transit fleet. Clockwise from top left: electric trolley buses, cable cars, light rail vehicles and historic streetcars*

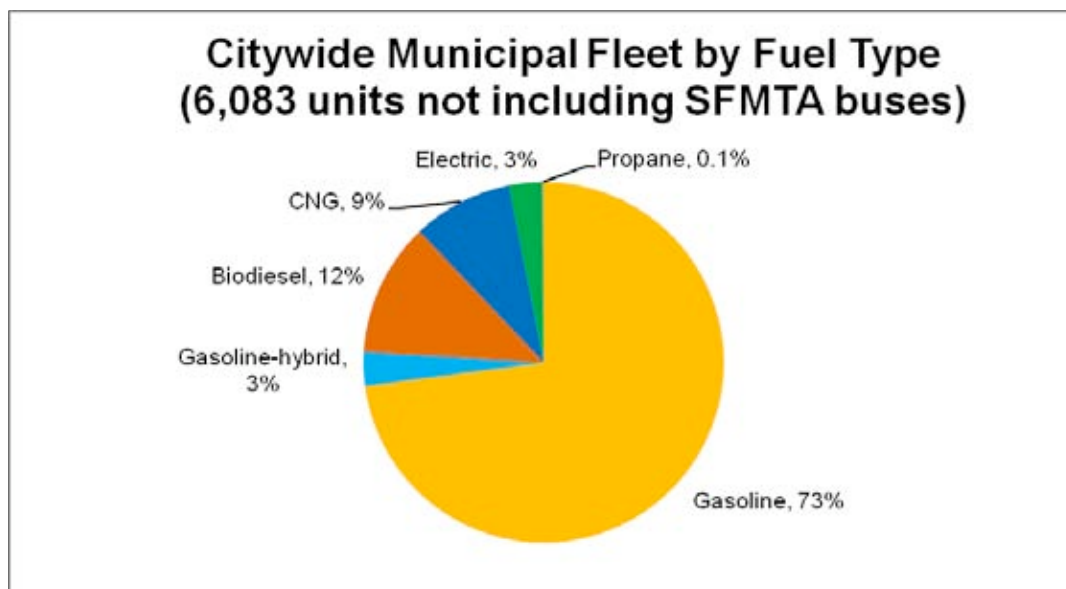
Fuel use by revenue vehicles is the single largest contributor to the SFMTA's agency footprint. The purchase of hybrid buses, offering fuel economy increases above 25 percent, and the longer term conversion to electric buses are the keys to reducing total fuel usage. It is important to note that since 1990 the SFMTA's bus fleet has increased by 17 buses. Further success in service expansion will also translate to a larger overall fuel footprint. The goal is to reduce fuel use per SFMTA VMT. This is accomplished through a mode shift to an all-electric fleet by 2020 (see Clean Air Plan, page 36). The following charts show the SFMTA's vehicle mode split versus citywide municipal vehicle modes.

SFMTA vehicles by fuel type:



Clearly, the SFMTA's non-revenue fleet is an area that can be improved; however, many of these vehicles are specialty vehicles such as parking control vehicles and heavy-duty transit maintenance vehicles which typically offer very few alternatives in terms of fuel type and mode conversion. Over 70 percent of DPT's 462 vehicle fleet are parking control vehicles. For comparison, below is the citywide municipal fleet summary by fuel type. Seventy-two percent of the citywide municipal fleet is made up of cars, pickups, SUVs and vans.





### **Reduction measures**

This section details measures in both transit vehicles and non-revenue vehicles.

### **Transit Vehicles**

Projects and improvements order of implementation:

#### **1999-2002 Automatic Vehicle Location System (NextBus) Project**

This project helps reduce citywide emissions by providing a GPS based, real-time information, customer service and a management system for all of the SFMTA's current revenue modes, therefore helping to encourage increased ridership and reduced private vehicle miles and traffic congestion. Automatic Vehicle Location (AVL) systems are used to provide real-time vehicle location information and arrival predictions to transit customers. AVL systems are also used to assist operations managers in recovery from service disruptions as they allow line managers to receive continuous updates of vehicle locations. Archived AVL data also provides the basis for performance and schedule adherence analysis and reporting.

#### **2001-2003 Alternative Fuel Pilot Program (AFPP)**

Muni's modern emissions-reduction programs were borne out of an agreement between the SFCTA and Muni. In March 2001 SFCTA attached the Alternative Fuel Pilot Program (AFPP) as a condition to SFCTA Resolution 01-08, which authorized Muni's purchase of Neoplan diesel buses.

The AFPP was designed by Muni with SF Environment and UC Berkeley to allow Muni to identify the most appropriate low emissions bus technology to work within the constraints of San Francisco's unique terrain and duty cycle performance demands. Additionally, the program was designed to allow Muni to identify associated facility support requirements.

Formal data were collected for two years on eight buses representing four categories of transit bus technology: diesel hybrid, CNG, conventional diesel with exhaust after treatment and baseline conventional diesel. Additionally, informal evaluations were performed on LNG, battery-electric and gasoline hybrid bus

technologies. The data were examined to determine the impact of the various characteristics of each bus technology to Muni, such as performance, emissions, reliability factors, cost per mile, capital costs for the buses and facilities improvements, any safety concerns and operator and customer feedback.

The AFPP was also designed to ensure that Muni would become experienced at adapting to and operating with the newest and least polluting bus technologies while posing the least risk to Muni's ability to meet service standards required by Proposition E.

UC Davis Institute for Transportation Studies (ITS) assisted with major program testing, including the design of an unprecedented heavy-duty chassis dynamometer emissions cycle that simulated grades and San Francisco's specific duty cycle. The final deliverable from the AFPP was the 2004 Clean Air Plan.

#### 2004 Clean Air Plan

The SFMTA's Clean Air Plan – Zero Emissions 2020, released jointly with the SF Department of Environment, was unveiled by Mayor Newsom in February 2004 and adopted by the Board of Supervisors in 2005.

The Clean Air Plan represents the first major revision of Muni's original 1996 plan for clean air captured in the 1997 Short Range Transit Plan (SRTP) Fleet Program. This original plan called for complete replacement of all active, pre-1996 buses by 2003. The plan was successful in reducing particulate matter emissions by 88 percent from 1997 to 2003, though the goal of 100 percent replacement of old buses was not fully met until 2007. This reduced particulate matter emissions by 99 percent compared to 1997 levels.

Muni's 2020 zero emission fleet will be comprised of:

- Electric trolley buses
- Fuel cell and/or battery-electric buses
- Light Rail Vehicles
- Historic streetcars
- Cable Cars.

For almost 70 years, Muni has continuously operated a network of zero emission cable cars, streetcars, electric trolley buses and modern light rail vehicles. These electric vehicles not only make Muni the cleanest transit system in California today by CARB standards, they also position Muni to continue its leadership with an all-electric fleet by 2020. The main point of emphasis in the Clean Air Plan is the overall fleet turnover and cleanup strategy itself - not necessarily the associated dates, which were derived through considerable research, but are very much subject to industry progress, market development and other variables. The Clean Air Plan details SFMTA's three-pronged strategy to reduce fleet emissions:

1. Maximize the use of Zero Emission Buses
2. Replace conventional diesel buses with hybrids as a bridge technology to fuel cells
3. Clean up the remaining fleet with best available retrofit technologies and alternative fuels

In addition to the 2006 purchase of 86 hybrid buses, the Clean Air Plan specifically called for:

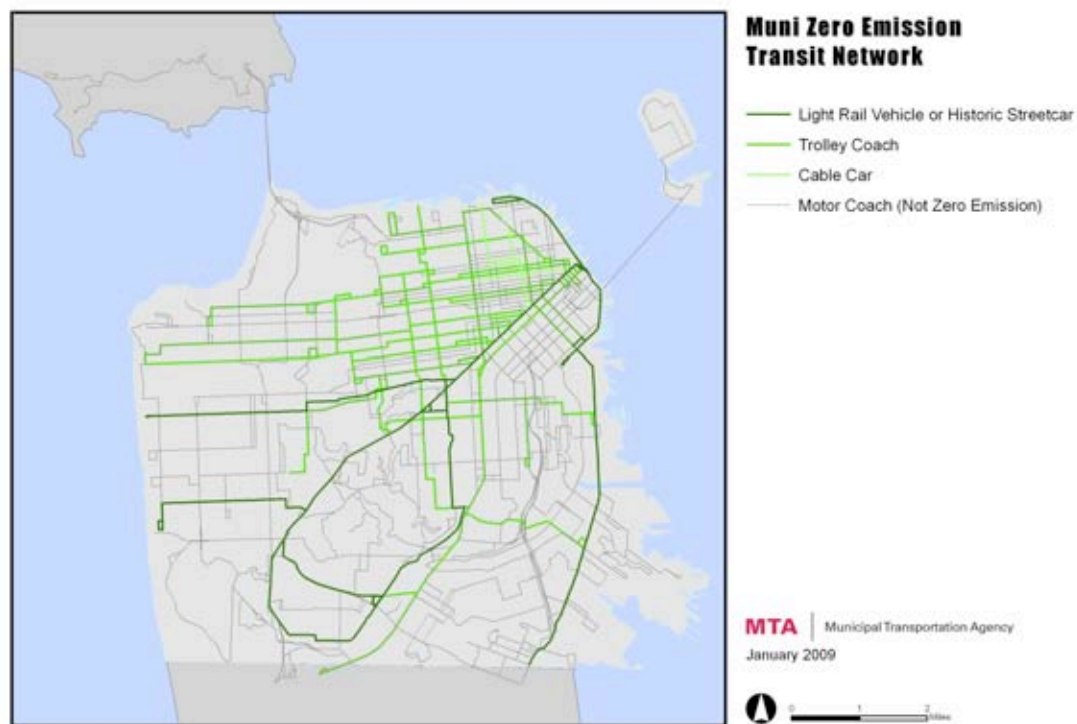
- Installation of exhaust after-treatment devices on all 374 modern diesel engines (completed)
- Use of biodiesel in all diesel vehicles (done; the Mayor's EO required this in 2007)
- Rehabilitation of remaining 1991 articulated buses, bringing them up to current diesel bus standards with modern engines and exhaust after-treatment (six of these buses remain – all in the reserve fleet and none has been retrofitted to date as funding was diverted to crucial and non-funded revenue service vehicle repairs)
- Completion of the Islais Creek motor coach division to support "lighter than air fuel technologies" (2012)



## 1. Maximize the Use of Zero Emission Vehicles (ZEVs)

### Expand Existing Electric ZEVs:

Transit vehicle emissions are at their absolute minimum with an electric bus or rail vehicle running on hydroelectric power, as is the case in San Francisco. Muni ZEVs currently include roughly 550 electric buses, light rail vehicles, historic streetcars and cable cars. Muni has as many zero emission buses (331) as all other transit agencies in the United States combined. Over half of Muni passenger trips (57 percent) are on ZEVs – roughly 400,000 passenger trips per day



*Muni's existing zero-emission electric network of cable cars, trolley buses, light rail vehicles and historic streetcars*

### Focus on Fuel Cell and Battery-Electric Buses for the Future:

Six prototype fuel cell buses have been evaluated in the Bay Area during the past five years as part of CARB's Zero Emission Bus Demonstration Program. An Advanced Demonstration Program is now in the procurement phase. Twelve new fuel cell buses will be tested for at least three years in the Bay Area, shared by all major agencies. Another zero emission alternative for Muni is full-size, battery-powered buses, although these vehicles are currently limited by travel range and battery life. While these technologies may not be available as a viable, large-procurement option for another decade, battery-electric and fuel-cell powered buses could eventually do away with the need for overhead contact wires and an immediate dependence on grid provided electricity, allowing Muni to replace all conventional and hybrid buses with zero-emission technologies. This will fully eliminate transit fleet vehicle emissions.

## 2. Replace Conventional Diesel Buses with Electric Drive Buses

San Francisco's demanding operating environment and long history of operating electric trolley coaches puts Muni in a unique position to help lead the industry in the adoption of electric drive systems. For the majority of U.S. properties, hybrid buses are being chosen as the most appropriate electric bus technology because of their ability to be integrated without additional infrastructure. Like all forms of electric buses, hybrids provide greater power, less noise, fuel savings and lower emissions than conventional diesel or natural gas buses. In general, the difference between electric bus technologies, including fuel cells, is in their source of electric power. A trolley bus uses overhead contact wires; a hybrid bus uses an engine and generator; a battery-electric bus uses batteries; and a fuel cell bus uses a fuel cell – everything else on the bus is essentially identical. This positions electric drive technologies as an ideal foundation for different service applications and bridging technologies.<sup>25</sup>

## 3. Update Remaining Diesel Buses to State-of-the-Art Clean-Diesel Standards

For the existing 425 active and reserve fleet buses that were not replaced by hybrids and are not eligible for replacement funding until 2013, the following emissions reduction updates were completed in 2007:

- PM/NOx reduction devices were installed fleetwide
- Modern engines were installed in older chassis for the reserve fleet
- All motor coaches are fueled with biodiesel

### 2006 Biodiesel Implementation

In accordance with the Mayor's Executive Directive 06-02 Biodiesel for Municipal Fleets, the SFMTA fuels all diesel vehicles with B20 (20 percent biodiesel blended with 80 percent conventional diesel). No biodiesel-related vehicle reliability problems have occurred to date and none are anticipated, due to industry- leading fuel handling quality assurance and fuel source quality control.

B20 reduces criteria pollutant and GHG emissions as well as the health risks associated with petroleum diesel. B20 reduces carbon monoxide by 12 percent, particulate matter by 18 percent, carbon dioxide by 15 percent and nitrogen oxide remains neutral. SFMTA and the City give preference to sustainably produced biofuels that meet ASTM D-6751 standards for use in diesel engines with a preference for local feedstock when available from sources including recycled fats, oil and grease and rendered animal fats and crops that can be cultivated on marginal or distressed lands under low-irrigation and low fertilization or rotated with other crops (including cover crops). Biodiesel that comes from industrial crops that compete with valuable food cropland, or contribute to deforestation, also are avoided. Instead, preference is given to biodiesel that maintains a favorable energy balance and that is produced by utilizing technologies or feedstocks that strive for net-zero waste and emissions.

### 2010 Compound Fuel Cell Hybrid (CFCH) Bus Demonstration Project

The Compound Fuel Cell Hybrid bus demonstration project is part of a national fuel cell initiative sponsored by the Federal Transit Administration (FTA). The purpose of the initiative is to demonstrate fuel cell technologies that can be readily commercialized and put into production. The program features an Orion VII Next-Generation hybrid bus that is otherwise identical to SFMTA's 86 existing Orion VII hybrid buses. The bus is painted in SFMTA colors and will go into one year of revenue service as part of the demonstration

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<sup>25</sup> For example, current hybrid buses can be upgraded in the future to fuel cell buses. Also, next generation hybrid buses can be potentially configured as trolley bus hybrids in order to use trolley bus infrastructure when possible while maintaining motor coach service flexibility. Market Street motor coach routes are one case where this could apply.

phase of the program. The SFMTA will partner with BAE Systems in maintaining the bus and in helping with data collection.

The bus has already undergone initial testing in its stock configuration to establish a performance baseline for the many changes to be made. It will be outfitted with a Lithium-Ion Energy Storage System (ESS), an updated Integrated Starter Generator (ISG) and a new Propulsion Control System (PCS) as part of the next generation 2010 BAE hybrid propulsion system. Finally the bus will receive hydrogen storage tanks, two small Hydrogenics fuel cells, electrically powered accessories and all of the associated electronics and data acquisition equipment as the final part of its conversion.

When fully converted the bus will demonstrate the use of hydrogen-fuel-cell-generated electrical power to operate all of the vehicle accessories including air conditioning (existing SFMTA buses do not include air conditioning), power steering, air compressor, pumps, fans and lighting. This will allow the bus diesel engine to shut off whenever the bus is stopped and to remain off until needed. Additionally, the lithium-ion energy storage system will allow the engine to remain off even during short start-stop driving periods in congested downtown areas. This operational scenario will help to reduce diesel fuel (B20) usage, reduce emissions further, and reduce noise pollution. In addition to demonstrating fuel cells, the bus will serve as a test bed for a variety of electrically operated accessory technologies and engine control strategies that can potentially be adapted to existing conventional and hybrid buses.

#### 2010 Advanced Fuel Cell Bus Demonstration Project

This second-phase program is a continuation of AC Transit's already successful Fuel Cell Bus Demonstration Project.<sup>26</sup> As with the initial program, the SFMTA already operates the country's largest ZEB fleet, and so San Francisco's participation in this Advanced Fuel Cell Demonstration Project is voluntary. AC Transit, Golden Gate Transit, SamTrans, and VTA are CARB-mandatory participants. For the advanced demonstration, AC Transit is the lead agency and will procure 12 fuel cell buses and construct the necessary supporting infrastructure.

The SFMTA will operate one or more of these buses in revenue service for at least one year in order to gain San Francisco-specific experience with the technology that will be extremely valuable in terms of better preparing to meet Clean Air Plan goals. The SFMTA will take the fuel cell buses to AC Transit's Division 4 maintenance facility in Oakland for fueling (also see Hydrogen Fuel Station summary in Next Steps) and for any significant maintenance. Operations and maintenance personnel will be trained by AC Transit.

#### Non-Revenue Vehicles

Appropriate route planning and reasonable driving habits are the foundation of non-revenue vehicle fleet emissions reductions. Educating employees on green driving techniques is an area that the SFMTA will emphasize.

City policy requires that 25 percent of new vehicle purchases be made up of alternative fuel vehicles, and the SF Department of the Environment provides and regularly updates their *Green Vehicle Guide* in order to

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<sup>26</sup> Details on the AC Transit and other fuel cell bus programs can be found in The National Renewable Energy Laboratory (NREL) 2008 report on the current status of fuel cell buses in the United States: <http://www.nrel.gov/hydrogen/pdfs/tp44133.pdf> This report, which is an update to one published in 2007, reviews fuel cell bus technology development and demonstration, specifically focusing on experiences and progress in the United States. The NREL review encompasses results from the U.S. Department of Energy (DOE)/NREL fuel cell bus evaluations as well as plans for the FTA's National Fuel Cell Bus Program. The primary focus of the report is a descriptive comparison of fuel cell transit bus operations in the United States and on the industry's need to continue successful implementations of these advanced technologies.

assist with light-duty vehicle procurements. Fleet turnover decreases emissions, increases fuel savings and lowers maintenance costs.

The SFMTA will collaborate with other City departments in providing departmental fleet inventory data to the Department of Administrative Services as part of the external, citywide fleet analysis being conducted in FY 2008-09. This information will include:

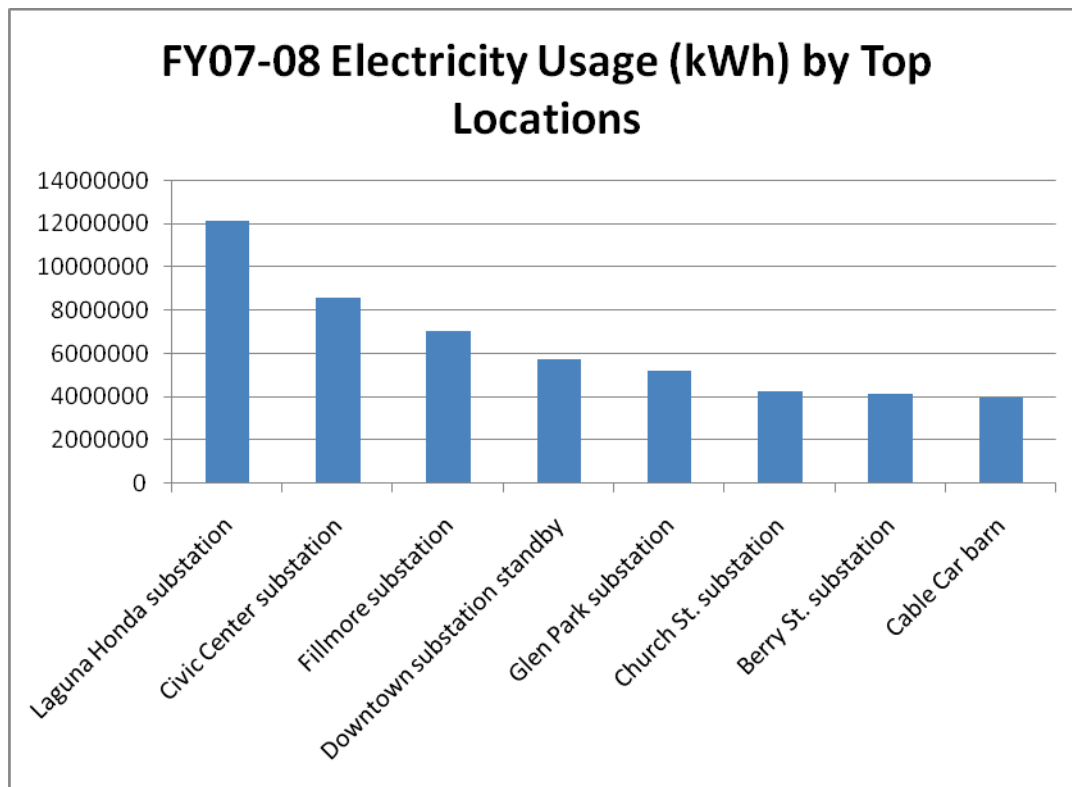
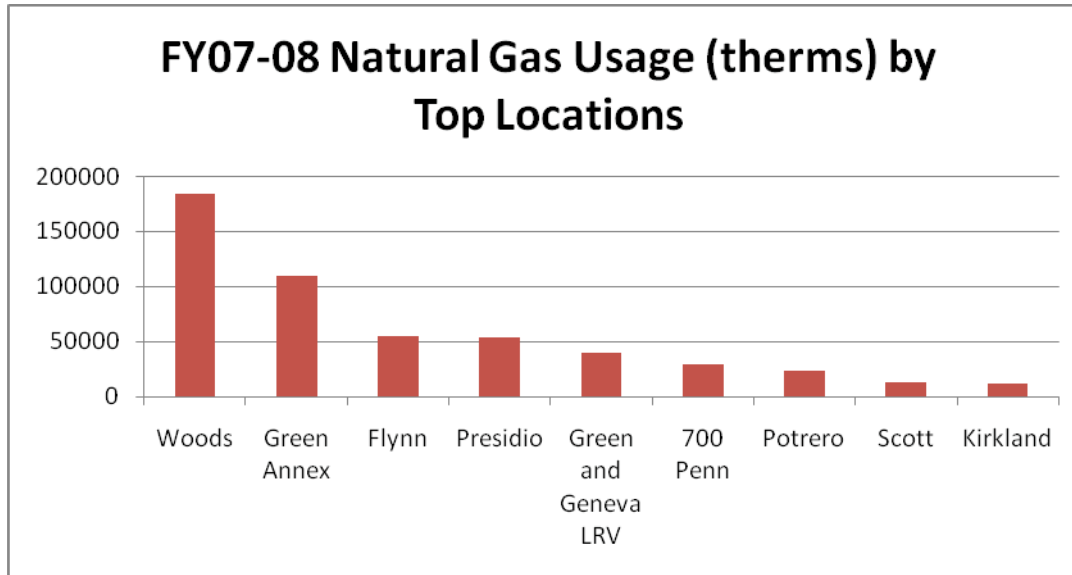
- Vehicle year, make, model, class
- Mileage data from maintenance and fueling
- Fuel usage data by fuel type (gasoline, biodiesel, CNG, propane, electric)

Over 1,000 non-revenue vehicles are currently operated by the Muni and DPT, including 76 that are fueled with biodiesel. Maintenance of non-revenue vehicles is performed at the SFMTA's Scott Street division. This work includes regular vehicle maintenance in order to optimize fuel efficiency and vehicle performance. The primary task in non-revenue vehicle purchasing is selecting and specifying appropriate vehicles for the intended application.

Chapter 4 of the Environment Code, Healthy Air and Smog Prevention Ordinance, requires City departments to plan for the retirement of older vehicles. Further, Fifty-six SFMTA non-revenue vehicles are subject to CARB regulations that require all transit agencies to reduce diesel Transit Fleet Vehicle (non-revenue) particulate matter (PM) by 80 percent in 2010 based on 2005 emission totals. Interim reductions include a 40 percent PM reduction and 3.2 NOx (oxides of nitrogen) average for 2007. Short of replacement, the agency must show that the best available technology has been retrofitted on each vehicle subject to the regulations. The SFMTA is using biodiesel in these vehicles while retrofit or replacement funding becomes available. Most of these vehicles are specialty vehicles used for track and other system maintenance.

The Parking and Traffic and Enforcement Divisions operate 453 vehicles. The Traffic Signal Shop, Sign Shop, Paint Shop and Parking Meter Shop operate a fleet of 89 light trucks and vans and two large trucks. The Division has 72 passenger cars that support the operation of the shops and the Traffic Engineering operation. The Enforcement Division's fleet is largely made up of three-wheeled Cushman or GO-4 vehicles used by Parking Control Officers. Twenty-six of the scooters are CNG powered, while 222 are gasoline powered. The Enforcement Division also has 46 gasoline powered passenger cars and trucks. The Enforcement Division has experimented with electric-powered scooters.



**C. Facilities and Infrastructure – Energy Efficiency and Renewable Energy Footprint**




**Current reduction measures****MECA Audit**

In order to help address potential waste, beginning this year the Mayor's Energy Conservation Account (MECA) requires an internal audit to be formally submitted in order to release the last 25 percent of each department's energy budget. The internal audit will include capital improvements as well as best practices such as energy conservation in computers and other technology hardware.

**PUC Energy Audit**

The SFMTA will receive detailed energy audit information and corresponding recommendations sometime in 2009. This list of recommendations will be the primary tools used to reduce City-owned agency infrastructure energy use.

**Real Estate Department Audit and Improvements**

As part of the Real Estate Department's Climate Action Plan, multi-tenant City buildings under Real Estate's jurisdiction will be reported in terms of energy use. For the SFMTA, One South Van Ness and 875 Stevenson are included. These building are therefore not included in SFMTA's specific plans and totals.

**SFMTA Real Estate and Facility Management**

The SFTMA will continue to advance and develop its TOD program to optimize properties owned, including parking lots, as candidates for TOD and related revenue generation strategies.

**Light Emitting Diode (LED) Traffic Signal Conversion**

In 2002, the DPT initiated a program to convert all traffic signal lamps from incandescent power to LED technology. This entailed converting a total of over 30,000 red, yellow and green traffic signal lamps and approximately 6,500 pedestrian WALK/DON'T WALK signal lamps to LEDs. As a result of this program, the annual energy consumption required to operate the City's 1,168 signalized intersections declined from 11,220,000 kilowatt hours per year to 1,803,000 kilowatt hours per year, a reduction of 9,417,000 kilowatt hours per year, or an 84 percent decrease.

**Solar Installations**

The SFMTA's Islais Creek Bus Division, currently in detailed design phase, offers an ideal solar ready City facility for a large scale installation. The facility is located in the one of the sunniest parts of the City, near Cesar Chavez and 3<sup>rd</sup> Streets, and has been designed with a south-facing, "saw tooth" roof. The solar installation is currently unfunded due to solar cost-benefit calculations that use the SFMTA's subsidized electricity rate rather than the rate the additional electricity would be sold for. The outside bus parking area and adjacent employee parking areas at Islais Creek and other SFMTA facilities are also ideal for large scale solar installations.<sup>27</sup>

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<sup>27</sup> The U.S. Postal facility at 1300 Evans Street, San Francisco, features a solar installation that covers the employee parking area, providing the added benefit of shade for employee vehicles.



**D. Solid Waste and Recycling**

In 2003 the San Francisco Board of Supervisors and Mayor adopted the Municipal Environmental Code (Ordinance 309-06). In an effort to divert energy used to harvest and process virgin resources and to conserve landfill space, the Resource Conservation Ordinance (RCO) directs all departments of the City to maximize the purchase of recycled products, reduce waste and divert as much solid waste as possible from disposal. In 2004 the Mayor signed a resolution creating a 75 percent Waste Diversion Goal by 2010 for each City department. The RCO also requires each City department to submit a Resource Conservation Plan that identifies the necessary programs and policies to obtain the ambitious 75 percent reduction goal.

The RCO requires purchasing of recycled products (paper, paper towels, engine oil). The RCO also requires:

- A departmental compliance letter committing goals and designating responsible person
- Departmental Waste Assessment (DWA) documenting waste diverted and disposed
- Resource Conservation Plan (RCP) on how department will achieve goals
- An Annual Recycling Survey (ARS) reporting solid waste diversion

The SFMTA recycles the following:

- Office paper, card board, bottles, cans (commingled recycling)
- Used computer equipment
- Used electronic devices (cell phones, computer media, batteries)
- All vehicle oils, fluids and vehicle batteries
- Metals (both vehicle parts and construction materials)
- Depreciated capital assets (vehicles and equipment)
- Carpenter shop saw dust is composted

Current and future work also includes:

- Full implementation of paper usage reduction measures, including use of double-sided printing by copiers and printers and default settings for double-sided copying
- Formalizing specific programs for each operations/maintenance facility due to each location's unique challenges
- Formalizing standard policies and guidelines for green procurements that are in concert with the City's Office of Contract Administration and SF Department of Environment directives
- Internally promoting solid waste and recycling programs
- Establishing a well defined standard for measuring progress

## **E. Employee Commute**

### **Overview of Employee and Citywide Commute Patterns**

San Francisco is a highly dense, hilly city of 47 square miles with a rich transportation network of alternative transportation modes. The City also has a *Transit First* policy. In addition to a strong tourism industry, San Francisco has a diverse local economy highlighted by the financial, legal, medical and education sectors and the City has become an international hub for a number of pioneering industries including biotechnology, digital media and information technology, clean technology, financial and professional services, retail and hospitality. This diverse local economy attracts a large number of workers who commute into the City. According to 2006 U.S. Census data, non-San Francisco residents commuting to San Francisco totaled 522,229 and San Francisco residents commuting out of the City totaled 96,392. There are a total of 354,558 vehicles available in San Francisco households, which is 1.10 vehicle average per household.<sup>28</sup>

The City of San Francisco has numerous policies in place that discourage automobile use. For example, the Planning Code does not require any off-street parking for most types of development in the downtown area and actively discourages the provision of off-street parking in downtown developments. The City also has a 25 percent parking tax, which significantly increases the cost of parking when it is provided. As a result, less than 20 percent of downtown workers arrive by single occupant vehicles.<sup>29</sup> One weakness in this policy is the State of California's lenient regulations regarding the issuance of Disabled Placards, which allow free, all-day, on-street parking to vehicles with Disabled Placards. In 2006 the State issued over 49,000 of these placards to San Francisco residents alone.<sup>30</sup>

In September of 2007 the SF Department of the Environment completed a transportation survey of City and County of San Francisco (CCSF) employees. This study was funded in part by The Clean Air Transportation Program which has implemented a commute assistance program with CCSF employees since 1999 with the primary focus on trip reduction in an effort to alleviate traffic congestion and to improve air quality. The transportation survey had three objectives: to identify current commute trends and the percentage of those driving alone, identify the incentives to reduce the number of single occupant vehicles and determine the most preferred commute modes and satisfaction with various travel modes. The survey was distributed to 29,000 City employees and over 10 percent (3,049) responded to the survey.<sup>31</sup> The SFMTA will use the current SF Department of the Environment survey to revise these numbers in 2009 in order to provide updated data and trends.

### **Employee Home Locations**

Almost half of City employees reside in San Francisco (47 percent) with the rest (53 percent) residing in neighboring counties in the Bay Area region, predominantly in San Mateo, Alameda, Contra Costa, Marin and Solano counties. Almost half the respondents commute over 15 miles one-way to reach their work location and nearly 30 percent of commuters spend 30-45 minutes one-way to reach their work destination. Roughly 10 percent spend over an hour daily to get to work. Greater than 80 percent of employees work a full-time (40 hours per week) schedule followed by approximately nine percent who work a compressed week (9/80) schedule. Over 50 percent of survey respondents start their work schedule between 7:30am-8:30am, and 67 percent of survey respondents end their work during the afternoon commute time of 4:30-6:30pm.

<sup>28</sup> SF Transportation Fact Sheet, May 2008. SFMTA.

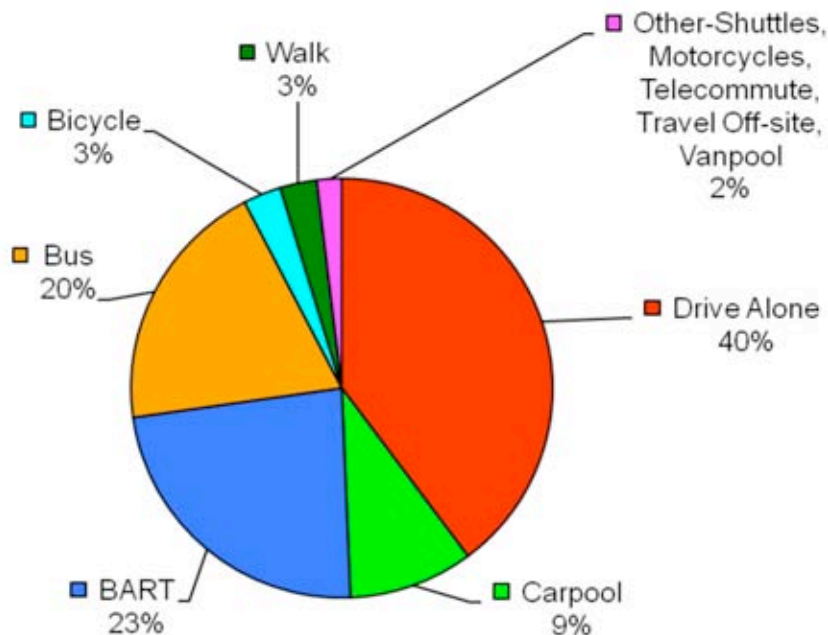
<sup>29</sup> Citywide Travel Behavior Study, City Planning Department, 1993

<sup>30</sup> Department of Motor Vehicles

<sup>31</sup> Department of The Environment City and County of San Francisco, SF City Employee Commute Survey, Analysis of Survey Results. Prepared by Clean Air Transportation Program and Department of the Environments with support from SF County Transportation Authority. September, 2007. pgs. 2,5-11,12, 14.

The chart below displays the travel modes used to get home from work by City employees (the chart for getting to work is nearly identical). Nearly 40 percent drive alone each day and telecommuting is the least used commute mode. BART (23 percent) and bus (20 percent) are the most popular driving alternatives followed by carpooling by a little over 10 percent of survey respondents. Use of travel modes during the week is fairly consistent except on Fridays when drive alone rate increases slightly. Carpooling is one of the three most popular driving alternatives used by City employees. In comparison, vanpools are used by only a small percentage of City employees.

**City and County of San Francisco Employee Travel Modes from Work**



### **Current trip reduction measures**

#### **SFMTA Employee Commuter Benefits**

Employee badges serve as a free transit pass for all SFMTA employees as an incentive for employees to ride public transit and not drive a vehicle to work. Additionally, passes are provided to transit operator family members.

The SFMTA offers a compressed work week pilot program (9/80) that is advantageous for employees that need to commute long distances from their homes to their place of work and would prefer to work four 10-hour days and every other Friday instead of commuting five days a week to work.

Telecommuting is a desirable option for employees who need to work from home and have tasks that can be performed via telephone or computer and do not need to be physically present in the office to complete their job objectives. This is useful for employees that must commute long distances from home to work and would like to save time and reduce their transportation expenses and reduce vehicle emissions.

Teleconferencing and videoconferencing from work are two tools that are offered to employees if project objectives can be completed using these tools. These practices reduce the need for employees to travel to other offices in the City, the Bay Area region or farther to attend meetings.

#### *City and County of San Francisco Employee Commuter Benefits*

Commuters who take the bus, train, ferry or vanpool to work can save up to 40 percent on their commuting expenses. The federal government allows employees to deduct up to \$120 per month from their paychecks pre-tax to pay for transit and vanpool expenses. Employees save by using pre-tax dollars for their commute expenses, and employers get the advantage of reduced payroll taxes and a popular benefit program that's easy and inexpensive to administer.

Thousands of employers in San Francisco and across the country are already offering commuter benefits to their employees. The City and County of San Francisco offers commuter benefits to approximately 30,000 employees; more than 15 percent are enrolled. Effective January 19, 2009 all employers in San Francisco that have 20 or more employees are required to offer a commuter benefits program.<sup>32</sup> Nearly 60,000 commuters have signed up for the Emergency Ride Home program, a free ride home in case of an emergency for employees who choose driving alternatives for their commute to work. By providing significant cost savings, commuter benefits encourage people to use transit and vanpools to get to work. This helps to relieve traffic congestion and to reduce air pollution.<sup>33</sup> The SFMTA will also work with the SF Department of Environment to implement the City's Bicycle Fleet Program which replaces employee work-related trips with bicycles.

#### *Spare the Air Days*

Eliminating fares has been demonstrated to increase transit ridership. Since 2004 MTC and ABAG have sponsored several free transit days on high pollution, Spare the Air days which have resulted in significant increases in transit usage. On the two Spare the Air days in 2007 transit ridership on the 29 Bay Area public transit agencies that provided free fares increased by 23 percent. Muni ridership increased by 200,000 on each of these days, a 35 percent increase over comparable days. BART ridership increased by 5,000 riders per day, a one percent increase, while AC Transit ridership increased by 62,000 riders per day, a 27 percent increase.<sup>34</sup> Some transit services experienced overcrowding problems due to the increased ridership. For example, ridership on the Sausalito Ferry increased by 500 percent on some Spare the Air days, resulting in regular riders being turned away.

The cost of free transit on Spare the Air days is approximately \$2 million per day. This cost is subsidized by MTC and BAAQMD.<sup>35</sup> Due to funding limitations, there was only one free transit Spare the Air day in 2008 held on a date fixed in advance rather than on a day with high pollution. Bay Area bus systems, including Muni, were free all day, while BART, Caltrain, AC Transit and Bay Area ferries were free until 1 p.m.

#### *Free Tourist Buses*

The Golden Gate Park Concourse Authority operated a free intra-park shuttle bus in Golden Gate Park during weekends between May and October from 2001 through 2004. The free service was funded by BAAQMD Clean Air Program grants and by the Concourse Authority. The shuttle buses operated every 15

<sup>32</sup> SF Dept. of Environmental Commuter Benefits.

<http://sfgov.org/site/frame.asp?u=http://www.sfenvironment.org>.

<sup>33</sup> SF Dept. of Environment. Commuter Benefits:

<http://www2.sfenvironment.org/aboutus/air/commute/index.htm>.

<sup>34</sup> ACE train newsletter, Nov-Dec 2007:

[http://www.acerail.com/docs/pdf/Newsletters/ACENov\\_DecNewsletter.pdf](http://www.acerail.com/docs/pdf/Newsletters/ACENov_DecNewsletter.pdf)

<sup>35</sup> Wikipedia: [http://en.wikipedia.org/wiki/Spare\\_the\\_Air\\_program](http://en.wikipedia.org/wiki/Spare_the_Air_program)

to 20 minutes between Stanyan and Fell Streets and the Great Highway. The service was discontinued when the grant funding ended. The use of cleaner vehicles for this service is an area that can be improved upon if additional funding for future such programs is identified.

Several privately-operated bus companies also provide bus service to San Francisco visitors. Major destinations served include Union Square, Fisherman's Wharf, Chinatown, Civic Center and the Golden Gate Bridge.

#### Vanpools

511 Rideshare, the regional ridematch agency, reports that there are 142 registered vanpools with San Francisco destinations and 22 registered vanpools that originate in San Francisco each workday. The SFMTA encourages vanpooling by allowing vanpools with permits to park all day in metered parking spaces with a time limit of 60 minutes or more without paying the meter. The Agency currently issues 97 on-street vanpool parking permits to vanpool users.<sup>36</sup> The cost for vanpool permits is \$74 per year.

#### Carpools

The SFMTA encourages carpooling by providing on-street carpool parking permits for commuter vehicles to employees of institutions such as San Francisco General Hospital. There are three on-street carpool parking areas and 52 on-street carpool parking permits issued.<sup>37</sup> Carpool vehicles must have at least three people. The cost for carpool permits is \$74 per year. The SFMTA works with Caltrans to sign and enforce a carpool and vanpool route to the Bay Bridge along Beale and Bryant Streets to the Sterling Street high occupancy vehicle (HOV) entrance to the Bay Bridge. This on-ramp is currently being rebuilt, which will increase the number of HOV that can enter the bridge at this point. Carpool vehicles also receive the added benefit of being able to use regional carpool lanes during commute hours. According to U.S. Census 2006 data, seven percent of San Francisco residents use carpools as a means of transportation to work. Thirteen percent of City and County of San Francisco employees use carpools or vanpools to get to work. There are currently 804 carpools originating in San Francisco and 1,750 carpools destined to San Francisco registered with 511 Rideshare.

#### Casual Carpooling

Many people commute into San Francisco each morning from the East Bay by casual carpooling. As mentioned above, the SFMTA provides carpool drop off zones on Howard Street between Fremont and First Street to facilitate safe unloading of passengers at these locations. In order to encourage casual carpooling home from San Francisco in the evening, SFMTA provides a casual carpool pick-up point on the east side of Beale Street between Howard and Folsom Streets. Approximately 200 casual carpools of three or more people each are formed each weekday between 4 and 6 p.m. at this location. The signed destinations are: Fairfield, Vallejo, Suisun, Richmond Parkway, Hercules, North Berkeley, Del Norte, Orinda, Lafayette, Walnut Creek, Pleasant Hill, Concord and Oakland (Claremont Avenue or Lakeshore/Grand). These stops were established by the SFMTA in 1997 in response to a BART strike. Vallejo is the most popular casual carpooling destination out of San Francisco in the evening as carpools to this destination can take advantage of a near-continuous HOV lane on I-80 in the East Bay.

#### Taxis

In 2007 there were 1,431 taxi medallions which permit taxi drivers to operate in the City of San Francisco. There are currently not enough taxis in the City during peak periods to meet public demand and the Taxi Commission is currently studying revamping the taxi permitting system to increase supply. Another issue

<sup>36</sup> The SFMTA, SF Transportation Fact Sheet, Vanpools, May, 2008.

<sup>37</sup> The SFMTA, SF Transportation Fact Sheet, Carpools, May, 2008.



the City is addressing is the proliferation of limousines that are serving passengers staying at City hotels. Limousines are supposed to operate only with specific private contracts but many are illegally acting as taxis and picking up passengers at City hotels.<sup>38</sup>

#### Private Shuttles

Currently there is one jitney<sup>39</sup> operating along the Mission Street corridor. There are over 30 private shuttles, not including hotel and airport shuttles, that operate mostly in the downtown and South of Market area. These are private shuttles operated by businesses that pick-up and drop-off their employees from regional transit stations such as BART Stations, the Ferry Building, Caltrain and the Transbay Terminal. Other shuttles serve students and staff of hospitals and academic institutions and have a wider route network throughout the City. Opportunities exist for shuttle consolidation because many of the shuttle routes overlap and ridership numbers are low enough that it would be more cost effective to operate one shuttle serving several businesses.

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<sup>38</sup> Overview of The San Francisco Tax Industry and Proposition K, A Short Report Prepared for the Charter Reform Working Group, A Policy Body of the San Francisco Taxi Commission The San Francisco Taxicab Industry Today, 2007.

<sup>39</sup> Section 1076 of the Police Code defines a Jitney Bus as "...a motor vehicle for hire less than 20 feet in length traversing the public streets between certain definite points or termini and conveying no more than 15 passengers for a fixed charge...".



## **F. Capital Projects**

### **Green Building Ordinance**

SF Department of Environment Code Chapter 7 has established LEED Silver as the green building standard for all new construction, renovation and additions over 5000 square feet in municipal buildings.

When the SFMTA Muni Metro East (MME) and Islais Creek Bus Division projects were conceived and designed, the City mandated LEED silver certification was not required. However, where possible, the SFMTA has incorporated green elements as described below. For one of the newer projects, Burke Facility, which is in the conceptual engineering phase, the office area of the warehouse will be designed to meet LEED silver rating although specific elements have yet to be identified.

#### **Muni Metro East LRV: (completed)**

The Muni Metro East facility was built on a 13-acre, vacant former Western Pacific Railroad site just northwest of Pier 80, bounded by 25<sup>th</sup> Street on the north, Illinois Street on the west, Cesar Chavez Street on the south and Louisiana Street (Paper Street) on the east. The facility is needed to support the new Third Street Light Rail Line as well as to relieve the overcrowded conditions of the Metro Green/Geneva facility.

Functionally, the Metro East Facility will be a stand-alone facility capable of providing car cleaning, fare extraction, preventive maintenance, running repair, heavy repair, wheel truing, materials/parts storage services and other support services (such as truck shop, pantograph shop, HVAC shop, metal shop, pneumatic shop, welding shop, machine shop, etc.) to support an 80 LRV fleet. Specifically, the facility will consist of the following:

- 180,000 square foot, steel-framed Maintenance Shop Building founded on piles, with a partial second floor for the Transportation Division and other support services and with a partial mezzanine level
- Smaller Meet and Greet structure
- A paved, open yard for the 13-acre site with tracks and overhead catenary system for LRV storage; the yard will also have a dedicated ATCS test track
- An onsite employee and non-revenue vehicle parking lot for 180 rubber tire automobiles/trucks
- Traction power substations
- Access roads, utilities and tracks from Third Street to the facility via 25<sup>th</sup> (primary entrance/exit) and Cesar Chavez Streets (secondary entrance/exit)

Muni Metro East greening features include:

- Use of brown field site
- Bicycle storage and changing room
- Recycled water for car wash system
- HVAC without HCFC or Halon
- Contractor administered construction waste management
- Radiant heating with temperature control
- Carpet tiles from recycled material

#### **Islais Creek Bus Division: (detailed design)**

The SFMTA will design and construct a new bus yard to be located on 5.32 acres of City-owned land at 1301 Cesar Chavez Street. The new bus yard will include parking for 165 of the SFMTA's 40-foot diesel and diesel-hybrid buses and 19 non-revenue vehicles, three buildings with 16 service bays plus facilities for operations, maintenance, administration, fuel and wash. The SFMTA will use the adjacent 2.4 acres of Caltrans property located to the west of the proposed facility for motor coach parking and/or limited employee parking. The SFMTA will also use the interim facility at 1399 Marin Street, across Indiana Street,

for employee parking and other SFMTA functions. The new Islais Creek facility will replace the existing Kirkland motor coach facility at North Point and Stockton.

On the north shore of Islais Creek, the SFMTA will create an edge treatment that reflects the historical industrial and port uses here along the bay, and will work with the Bay Conservation and Development Commission (BCDC), San Francisco Arts Commission and Friends of Islais Creek.

Islais Creek Division greening features include:

- Designed for maintenance and future fueling of hydrogen fuel cell buses
- Extensive skylights for energy conservation
- Recycled water for car wash system

#### Central Subway:

The Central Subway will extend the Muni Metro T Third Line through the heart of San Francisco, directly linking Chinatown, Union Square, SOMA and the southeastern neighborhoods. This vital rail link will encourage new transit customers, contributing to over 17,000 new transit boardings daily, eliminating vehicle-dependence for many households and enabling truly transit-oriented development.

The stations of the Central Subway are designed according to sustainable building practices that include material reduction, use of recycled and recyclable materials and energy efficiency. Structural concrete mixes will include fly-ash, an industrial by-product that reduces the use of quarried cement while improving concrete workability and durability. The main interior finishes are glass, steel and terrazzo. These materials have been selected for their durability, timeless aesthetics and recycled content. Post-use glass and porcelain aggregate will be used in terrazzo, a floor surface that will last for many decades. Wherever appropriate, structural concrete and steel will be treated to provide a second function as the architectural finish, avoiding the use of additional materials. Station entrances will make use of daylight, while the underground spaces, including tunnels, will be lit with energy-efficient and long-lasting LED fixtures. TOD will be integrated in the design of portals and station entrances wherever feasible. The SFPUC is interested in working with the SFMTA on using water pumped out of Central Subway and existing underground tunnels and stations for above ground landscape watering.

#### Clean Construction Guidelines

Adopted by the San Francisco Board of Supervisors in 2007, when this new law takes effect in March 2009 contractors on large (20+ day) City, and in this case SFMTA construction projects, are required to meet clean construction equipment requirements for vehicles and/or equipment operated more than 20 hours during any portion of the project. The SFMTA has the authority to impose sanctions for non-compliance similar to those invoked for other failures to meet contract obligations.

SFMTA contractors performing major project work will be required to:

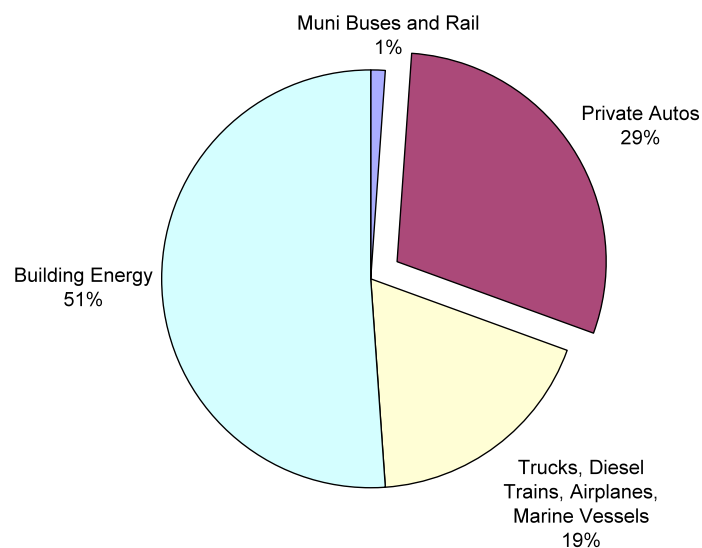
- Fuel diesel vehicles with B20 biodiesel
- Use construction equipment with engines that meet US EPA Tier 2 standards for off-road engines or else use best available control technology for any engine over 25 hp

## **VI. ADDITIONAL CLIMATE ACTION PROGRAMS AND EFFORTS POTENTIAL AND NECESSARY NEXT STEPS**

There are roughly 1,000 days between the release of this 2009 Climate Action Plan and the 2012 citywide goal of a 20 percent reduction below 1990 levels in carbon emissions. Citywide emissions have gone down by five percent since 1990, but the transportation sector's share of emissions has increased since 1990. Since San Francisco's population is projected to be 13 percent higher than 1990 levels in 2012, overall VMT reduction and *per capita* carbon emission reductions are the true measure of transportation sector progress. The initiatives previously outlined in this report will move San Francisco in the right direction and must be continued, but are not enough.

The scale of this challenge calls for substantially more proactive measures. As municipal GHG emissions constitute just six percent of the citywide total, the City must encourage emissions reductions beyond its own departments. Over one-half of all emissions come from the transportation sector, making it both a large challenge but also an area of opportunity. Private automobiles generate approximately 30 percent of the total and thus reducing their environmental impact must be a top priority. Although SFMTA does not have direct control over cars, the organization's policies and services strongly influence travel choice and thus transportation-related emissions.<sup>40</sup>

**San Francisco Greenhouse Gas Emissions & Opportunities for Reductions**



Three broad components will be required to achieve the carbon emissions reduction goals:

- **Vehicular Emissions Reductions** – Making transportation vehicles cleaner is an effective way to mitigate climate change. The SFMTA can support policies to implement cleaner technologies such as plug-in cars that are powered from renewable sources of electricity, although the development of such technologies is subject to factors beyond the SFMTA's mandate or control. The SFMTA will continue to prioritize transitioning to alternative fuels and technologies for its motor coach fleet. The SFMTA will also work to provide plug-in stations in City owned garages and other public locations.

<sup>40</sup> In turn, the SFMTA's policies and services are strongly influenced by regional, state and national policies and funding priorities that are beyond the SFMTA's control. These may include, for example, fuel economy standards and funding for mass transit expansion.

- **Vehicular Demand Reductions** – In addition to supporting initiatives to make personal vehicles cleaner, the City is committed to congestion management and environmental protection through its *Transit First* policy. The SFMTA is working with its partners to enact policies that will help reduce demand for driving and thus lower associated GHG emissions. The SFMTA is currently studying congestion pricing, a demand management strategy implemented on existing roadways to both reduce traffic congestion and encourage public transit ridership. The SFMTA is also partnering with the City to steer high-density, mixed-use development along strong transit corridors. Finally, the SFMTA has launched *SFpark*, a pilot program testing variable pricing for parking that aims, among other objectives, to price parking appropriately to balance the needs of economic vitality and reduction of vehicle trips. *SFpark* also aims to reduce circling for parking and resulting GHG emissions.
- **Expansion of Transit, Walking and Bicycling** – The SFMTA's primary contribution to the reduction of transportation-related emissions will come through shifting people from cars to transit, walking and bicycling. Increasing the frequency and quality of transit beyond what is currently contemplated in the TEP recommendations and funding are essential to achieving a mode shift away from cars. As noted, adding more service will likely cause the SFMTA's own emissions to increase but will be offset by a much greater decrease in automobile-generated emissions.

All three of these components are integral to achieving transportation sector GHG emission reduction targets. For example, increasing TOD will only reduce driving if sufficient transit service is available or there is safe pedestrian access. Likewise, people may continue driving even if transit service is increased unless policies are implemented that encourage them to make rational financial decisions about their travel.

### **A. Vehicular Emissions Reduction**

#### **Transit Vehicles Including Non-revenue Vehicles**

The TEP enhanced budget plan envisions increased purchases of Muni fleet vehicles and construction of new, additional Muni facilities to accommodate the storage and maintenance of a larger fleet. At this time, funding for this expansion has not been identified nor which transit fleets (light rail, hybrid bus or electric trolley buses) would be increased.

In terms of bus fleet turnover and vehicle technologies, hydrogen fueling infrastructure must be pursued for two separate fuel cell bus programs in 2010 and facility preparations must be planned for hydrogen fuel by 2020 in order for the SFMTA to meet Clean Air Plan goals. The SFMTA should also pursue pilot programs featuring battery-electric vehicles. The Connected Bus pilot program allowed Muni passengers to preview potential, future opportunities to encourage additional ridership through access to more modern conveniences.

More than one half of the SFMTA's transit fleet consists of zero emission vehicles, including electric trolley buses which constitute one third. SFMTA is strongly committed to expansion of its zero emission fleet. While the TEP does not specifically propose a major expansion of the electric trolley bus network, it does include a number of reroutes and minor expansions, which maintain or slightly improve the utilization of trolley buses and rail vehicles in the short term. In the long term, expansion of the zero emission fleet will take the form of replacing conventional buses with new technologies such as battery-powered or hydrogen fuel cell buses.

Caltrain electrification and cleaner regional transit bus requirements are further steps in reducing San Francisco's overall transit emissions footprint.

**Non-transit vehicles**

State truck idling laws must be strictly enforced in San Francisco. This typically means five-minute maximum idle time per stop/delivery. Policies related to the use of cleaner truck fuels and technologies should be strongly evaluated with particular focus on high emission truck corridors.

**Private electric vehicles**

To support the transition to cleaner private vehicles, the SFMTA will investigate feasibility and cost of installing plug-in devices on the street for people to charge their cars.<sup>41</sup> The Mayors of San Francisco, San Jose and Oakland announced policies that they will advance, beginning in December 2008:

- Expedite permitting and installation of electric vehicle charging outlets at homes, businesses, parking lots and other buildings throughout the Bay Area
- Provide incentives for employers to install EV charging systems in their workplaces and provide similar incentives to parking facilities and other locations where EV charging stations can be installed
- Harmonize local regulations and standards across the region that govern EV infrastructure to achieve regulatory consistency for EV companies as well as expanded range for EV consumers
- Establish common government programs that promote the purchase of EVs
- Link EV programs and infrastructure to regional transit and air quality programs
- Establish programs for aggressive pooled-purchase orders for EVs in municipal, state government and private sector fleets and future commitment of purchasing preference for EV vehicles
- Expedite permitting and approval for facilities that provide extended-range driving capability for EVs in the region through battery exchange locations or fast-charging
- Identify and secure suitable standard (220V) electric outlets for charging low voltage EVs in every government building in 2009
- Identify roll-out plan for placement of 220V EV charging equipment throughout each city including city parking lots and curbside parking

To advance these policies, San Francisco, San Jose and Oakland Mayors will work with other regional cities, BAAQMD, MTC and ABAG, as well as with many private sector partners including the members of the Bay Area Council and Silicon Valley Leadership Group.<sup>42</sup>

**B. Vehicular Demand Reduction Measures****Transit-Oriented Development (TOD)**

Orienting land uses towards transit and walking is one of the most effective ways of managing travel demand and reducing automobile trips. Largely developed prior to World War II, San Francisco is the nation's second densest city and remains relatively transit-oriented compared to other cities. Within different San Francisco neighborhoods, however, vehicle ownership rates and corresponding transit ridership vary substantially. They are highly correlated with land use and density, even more so than income. For example, the lower-income and low density Bay View-Hunters Point area has substantially higher automobile ownership rates than upper-income and high density Cole Valley.

<sup>41</sup> On November 21, 2008 San Francisco Mayor Gavin Newsom, San Jose Mayor Chuck Reed and Oakland Mayor Ron Dellums announced a nine-step policy plan for transforming the Bay Area into the Electric Vehicle (EV) Capital of the U.S. In conjunction with the news, Better Place, a global electric transportation company, announced that it would enter the U.S. market with California as its first state, beginning in the Bay Area. Commercial availability of electric cars is targeted to begin in 2012, and Better Place estimates its network investment in the Bay Area will total \$1 billion when the system is fully deployed. The three Mayors said they welcomed Better Place's announcement and anticipate many other EV companies will focus on the Bay Area as a top-priority market.<sup>41</sup>

<sup>42</sup> Ibid.



San Francisco's Central Business District and oldest neighborhoods – primarily in the northeast quadrant – were built before current parking requirements were adopted and were designed around streetcars, cable cars and walking as modes of transportation. In the 1950s extensive freeway construction superimposed a high volume of automobiles and vehicular infrastructure on a street network that could not well accommodate them. The freeways in the northeast quadrant of San Francisco were mostly removed in the 1990s. These areas have largely retained dense, mixed-use development and accompanying high transit and walking mode shares. Not surprisingly, they also have the lowest automobile ownership rates at less than one vehicle per household.

Outlying San Francisco neighborhoods that were developed in the 1920s or later are still fairly dense and support transit relative to other cities. However, compared to the older parts of San Francisco, they are less dense and more automobile-oriented because they were built when car ownership rates had begun to increase. These neighborhoods feature wider streets, garages in homes and more parking availability. In particular, the areas south of Interstate 280 and southwest of Twin Peaks have automobile ownership rates exceeding 1.5 per household.

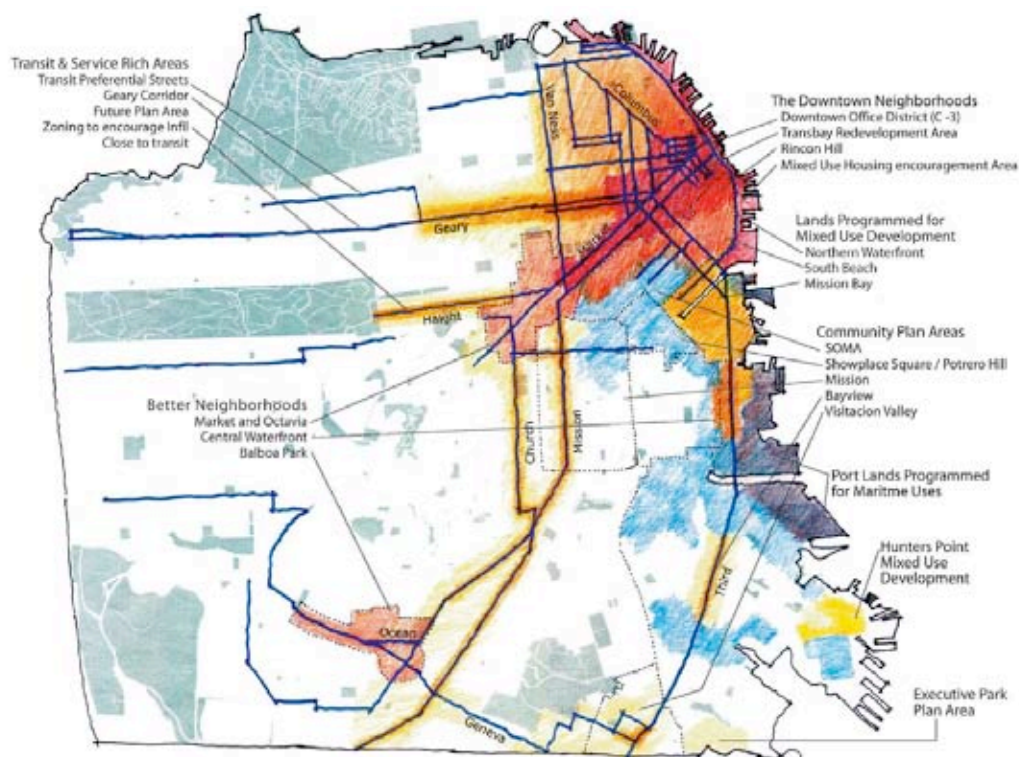
### Housing Density



### Car Ownership

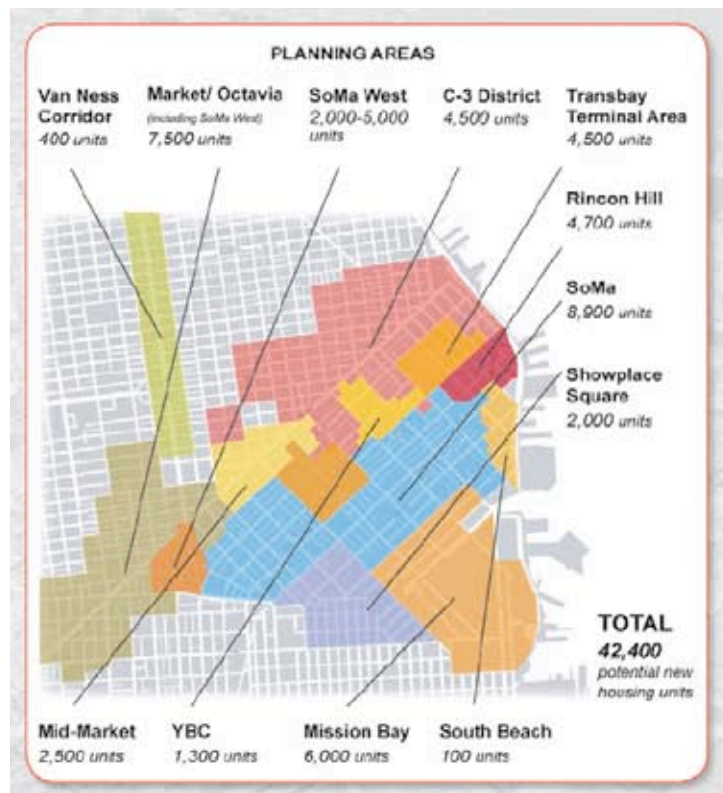


These observations suggest that continuing to link transportation and land use decisions is an extremely effective way to reduce automobile trips. The City of San Francisco has developed a Citywide Action Plan that outlines the type and location of future development. In particular, the City's Planning Department is developing policy initiatives for supporting and encouraging higher density, mixed-use, primarily residential infill in selected transit-rich corridors. Potential opportunities also exist to integrate residential or commercial projects with existing SFMTA-owned facilities, which would not only generate transit ridership but also could provide leasing revenues to support transit operations. By emphasizing growth around transit corridors, the plan is an important step towards the long-term reduction of GHG emissions.



The map above illustrates key initiatives of the Citywide Action Plan and their relationship to major transit corridors. While the plan focuses on areas throughout San Francisco, there are a couple of major studies particularly relevant to promoting transit-oriented development and reducing vehicle usage:

- **Eastern Neighborhoods Program** – This effort includes communities adjacent to the Third Street light rail line, the SFMTA’s most recent rail transit investment. Historically, the eastern waterfront has accommodated low-density industrial uses and the challenge will be to integrate new development along this corridor in a way that supports high transit ridership.
- **Downtown Neighborhoods Initiative** – This effort will provide a comprehensive strategy for strengthening downtown’s vitality and set the stage for as many as 40,000 new housing units in the City’s core. Steering new housing to areas where transit and walking are already very strong will help diminish the need for automobile ownership, reduce vehicle miles traveled and prevent associated GHG emissions. Furthermore, adding more residential units downtown will help increase transit ridership during off-peak hours when capacity is available.



*Downtown Neighborhoods Initiative – Potential New Housing Opportunities*

### **SFpark**

SFpark is an SFMTA initiative that will test variable pricing to improve the management of the City's limited parking supply. A major goal of SFpark is to reduce congestion and pollution associated with circling for parking. San Francisco will be the first city to implement a full array of parking management techniques and technologies. Elements include:

- New parking meters that accept many forms of payment, including coins, credit and debit cards
- In-street parking sensors that enable thorough evaluation, new pricing structures and more cost-effective enforcement
- Relaxed parking time limits and demand-responsive pricing that will help achieve parking availability targets; special event pricing will also be tested
- By reducing congestion, the number of needless vehicle miles travelled while searching for parking and, potentially, overall auto trip demand, SFpark is expected to reduce localized emissions of pollutants, including GHG emissions; helping transit become faster and more reliable is also expected to support the goal of attracting more people this green mode

SFpark's goals include:

- Reducing congestion – Use new parking management technology and techniques to reduce double parking, circling while looking for parking and the number and duration of automobile trips in peak times and places. Together, these changes are expected to reduce congestion. These impacts are expected to be most significant at the localized level within the pilot areas, e.g., at peak periods in areas with high travel demand, but may reduce congestion more broadly, e.g., bridges that are constrained at peak periods.
- Improving speed and reliability of public transit – Increase public transit's speed and reliability by reducing unpredictable delays caused by double parking and congestion.



- Improving air quality – By reducing congestion and the number of needless vehicle miles travelled while searching for parking, SFpark is expected to reduce localized emissions of pollutants, including GHG emissions.

### **Congestion Pricing**

Congestion pricing is another possible demand management strategy for San Francisco. Congestion pricing would be implemented on existing roadways to both reduce traffic congestion and encourage public transit ridership. Charging drivers a fee for the use of specific roadways is a way to reduce demand for driving on the most congested streets and at the same time make traffic flow efficiently for the remaining car traffic and for public transportation. It also makes the street more pleasant for pedestrians and cyclists. As London, Stockholm and others cities have demonstrated, the revenues generated by a congestion fee can be used to improve alternatives to driving such as transit, pedestrian and bicycle travel.

In 2005 the SFCTA received a grant from the U.S. Department of Transportation Value Pricing Program to study congestion pricing in San Francisco. Implementing the proposal would take several years at a minimum and require local, state and possibly federal approval. The study has currently identified two congestion pricing options:



(a) Double Ring: In this scenario drivers would be assessed a fee when entering the City of San Francisco from the Golden Gate Bridge, Bay Bridge and along the San Mateo County border. An additional fee would be applied to a downtown cordon centered around the Financial District, Civic Center and South of Market area north of the Central Freeway and the Bay Bridge approach. Approximately 4.6 million trips would be affected by this plan.

(b) Northeastern Cordon: In this scenario drivers would be assessed a fee when traveling into, out of or within the northeastern quadrant of San Francisco. The boundaries would be approximately Divisadero and 18<sup>th</sup> Streets.

Revenues from congestion pricing would be reinvested into local and regional transit, along with roadway, bicycle, pedestrian and streetscape amenities. Goals of congestion pricing would include:

- Congestion Management – 15 percent decrease in peak-period auto trips and a 30 percent reduction in vehicle miles traveled
- Sustainable Economic Growth – 30 percent decrease in vehicle hours of delay and a five percent to 10 percent reduction in annual inflation-adjusted congestion costs
- Reduced climate change impact – 15 percent reduction in GHG emissions from transportation and up to a four percentage point increase in transit mode share



**Other Vehicular Demand Reduction Strategies**

Carsharing allows members to access cars by the hour when needed which, when combined with transit, allows people to potentially forgo vehicle ownership altogether. Opportunities exist for SFMTA to partner with carsharing organizations to locate vehicles adjacent to transit stops and possibly provide financial incentives to carsharing members who also commit to using transit. U.S. studies and surveys indicate that between 11 to 26 percent of carsharing participants sold a personal vehicle, and between 12 to 68 percent postponed or entirely avoided a car purchase. Furthermore, U.S. and Canadian data reveal that each carsharing vehicle removes between six to 23 cars from the roads<sup>43</sup>.

Employers offering free or subsidized parking can implement parking cash out. Under this program an employer gives employees a choice to keep a parking space at work or to accept a cash payment or give up the parking space. Potentially, this payment could be used to pay for a transit pass. In San Francisco, parking cash out might be applicable to areas outside the central business district core where parking is more abundant, or for downtown garages where companies provide certain employees free or subsidized parking.

Currently, the SFMTA partners with colleges and universities to provide discounted transit passes, called the Class Pass, to students, as long as all students purchase a pass with their registration fees regardless of their transit usage. These passes encourage taking transit for school commutes and for employment or recreational trips, often during off-peak hours when transit capacity is available. Fees could be adjusted to expand market penetration while ensuring that enough revenue is generated for the SFMTA. This program could also be expanded to non-school organizations.

**C. Major Transit, Bicycling and Pedestrian Improvements**

In addition to supporting cleaner vehicle technologies and implementing policies to lower the demand for driving, a major expansion of transit, bicycling and walking is a core component of a GHG emission reduction strategy. Increasing the attractiveness of alternatives to private automobiles is necessary to support expected travel demand from new parking management strategies, congestion pricing, increased transit-oriented development and other demand mitigation policies as well as from population growth.

**Bicycling and Pedestrian Improvements**

Encouraging more people to bicycle and walk to their destinations is an effective, low-cost way to eliminate carbon emissions from certain trips altogether. Adding bicycle lanes and paths, implementing safety improvements and increasing bicycle parking supply can make bicycling more attractive even in a hilly city such as San Francisco. While a relatively small percentage of people currently bicycle to work, overall numbers are increasing. The potential for bicycling growth is high within San Francisco because many trips involve a distance of a few miles or less. Copenhagen and other cities have achieved bicycling mode shares of one-third or higher<sup>44</sup> by making bicycling safer through the physical separation of bicycles and automobile traffic and by providing bicycle parking.

Likewise, improving the pedestrian experience as provided in the SFMTA's Better Streets Plan can also increase the walking mode share. An important component to making walking more attractive is ensuring that streets and intersections are safe. The SFMTA continues to install countdown pedestrian traffic signals which have been shown to reduce injury collisions by over 50 percent, as well as scramble signals where

<sup>43</sup> "Carsharing in North America: Future Growth, Current Development and Future Potential", Shaheen, Cohen and Roberts, November 2005

<sup>44</sup> "Liveable Copenhagen: The Design of a Bicycle City", Alyse Nelson, Center of Public Space Research, Copenhagen and University of Washington, Seattle, 2007

vehicular traffic is stopped in all directions to allow pedestrians to cross the intersections. Improvements may also include reconfiguring the intersection of one-way streets where pedestrians are sometimes prohibited from directly crossing the street and instead must walk a roundabout route.

### **Transit Effectiveness Project**

The SFMTA TEP is a critical step in updating the transit network structure to reflect current travel patterns and to identify future growth needs.

#### *Operating Budget Neutral Scenario Capital Improvements*

The route and service recommendations in the TEP currently assume no new operating revenue sources. Therefore, enhancements along Rapid and other selected routes are balanced out by operational enhancements, such as delay reduction strategies, and by service reductions elsewhere. While no additional operating funding would be required, this base TEP scenario will still require approximately \$200 million in capital improvements consisting of the following elements:

- Reliability Improvements (\$5 million capital cost): Scheduling and data analysis tools, rail network study, additional terminal monitoring equipment and handheld devices for street supervisors
- Route Updates (\$150 million capital cost): Major terminals, operator restrooms, rail infrastructure (new terminals), bus infrastructure (including electric trolley coach infrastructure), stop enhancements and other initiatives
- Travel Time Improvements and Delay Reduction Strategies (\$45 million capital cost): Transit Priority Street infrastructure, Market Street enhancements, off-vehicle fare collection and other initiatives

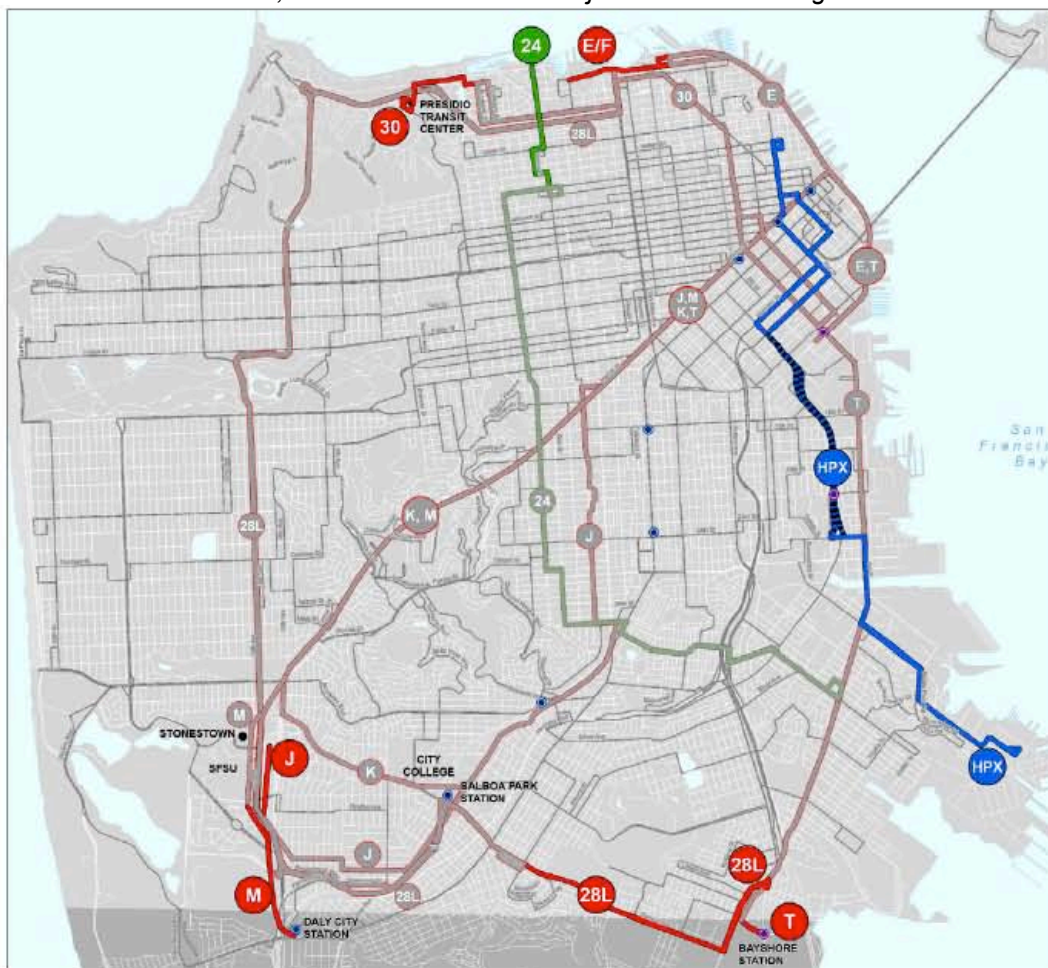
#### *Enhanced Scenario Operating and Capital Improvements*

The TEP has also identified a package of net service improvements that could be implemented with additional funding resources. Together, they represent approximately a 25 percent increase in service hours over existing levels.

- More Rapid and Express Services (\$77 million operating cost; capital costs to be determined)
- Peak and midday service along the Rapid rail and bus network would increase by approximately 20 percent beyond the budget neutral plan
- Expanding Rapid service would require purchasing additional vehicles, building new operating and maintenance facilities and addressing challenges such as capacity constraints in the Muni Metro tunnel
- New Network Connections (\$12 million operating cost; capital costs to be determined)
- New network connections to serve more destinations and enhance regional transit travel would require additional vehicles and some entail requisite capital investments in trolley wire or rail track. New network connections could include:

*New Network Connections, Transit Effectiveness Project Enhanced Budget Scenario*

Rail	<ul style="list-style-type: none"> <li>• Extending the F-Market and Wharves or new E Embarcadero historic streetcar to Fort Mason.</li> <li>• Extending the T-Third Line to the Caltrain Bayshore Station.</li> <li>• Running the J-Church Line beyond the proposed San Francisco State University (SFSU) terminal to Stonestown.</li> <li>• Extending the M-Ocean View Line beyond SFSU to Daly City BART.</li> </ul>
Electric Trolley Bus	<ul style="list-style-type: none"> <li>• Connecting the 24-Divisadero to the Marina using the 22-Fillmore overhead wires.</li> <li>• Building new overhead trolley wires to extend the 30-Stockton to the Presidio Transit Center.</li> <li>• Installing additional trolley infrastructure on parts of the Mission Street to allow both local and limited routes to use zero-emission trolley coaches and pass one another.</li> </ul>
Bus	<ul style="list-style-type: none"> <li>• Extending Route 28 to Visitacion Valley via Geneva, creating faster connections to the T Line and Bayshore Caltrain Station.</li> <li>• Adding a new express bus route to connect Hunters Point and downtown, serving current residents and preparing for new residents in Hunters Point.</li> </ul>

*New Network Connections, Transit Effectiveness Project Enhanced Budget Scenario*


- More Local and Community Connector Services (\$37 million operating cost; capital costs to be determined): The third component of the enhanced plan would increase frequency on local and community lines and extend the system's capabilities, bringing all routes up to recommended TEP minimum standards. The enhanced plan focuses on increasing service on Local routes and Community Connectors and shortening waiting times across the City. Additional Local service would require purchasing additional vehicles and building new operating and maintenance facilities.
- Enhanced Evening Network (\$12 million operating cost; capital costs to be determined): The fourth component would provide more frequent service at night to improve the quality of life for those waiting for and riding Muni after dark. This enhancement would not require significant additional capital investment because it would utilize Muni's existing vehicle fleet for more service hours each day. Community Connectors would see improvements as well.

#### Projected Transit Effectiveness Project Ridership Increases

<b><u>Transit Service Levels</u></b>	<b><u>Average Weekday Ridership</u></b>	<b><u>Ridership Increase over 2005</u></b>	<b><u>Ridership increase over 2005 %</u></b>	<b><u>Ridership increase over 2015 Baseline</u></b>	<b><u>Ridership increase over 2015 Baseline %</u></b>
<u>2005 Baseline</u>	<u>683,000</u>				
<u>2015 Baseline</u>	<u>786,000</u>	<u>+103,000</u>	<u>+15%</u>		
<u>2015 TEP Operating Budget Neutral</u>	<u>858,000</u>	<u>+175,000*</u>	<u>+24%</u>	<u>+72,000*</u>	<u>+9%</u>
<u>2015 TEP Enhanced</u>	<u>918,000</u>	<u>+235,000*</u>	<u>+32%</u>	<u>+132,000*</u>	<u>+14%</u>

\*Systemwide ridership is projected to increase due to the concentration of resources on high-ridership routes; however, ridership may decrease in areas or times of day when service is eliminated, frequency is reduced or hours of operation are shortened.

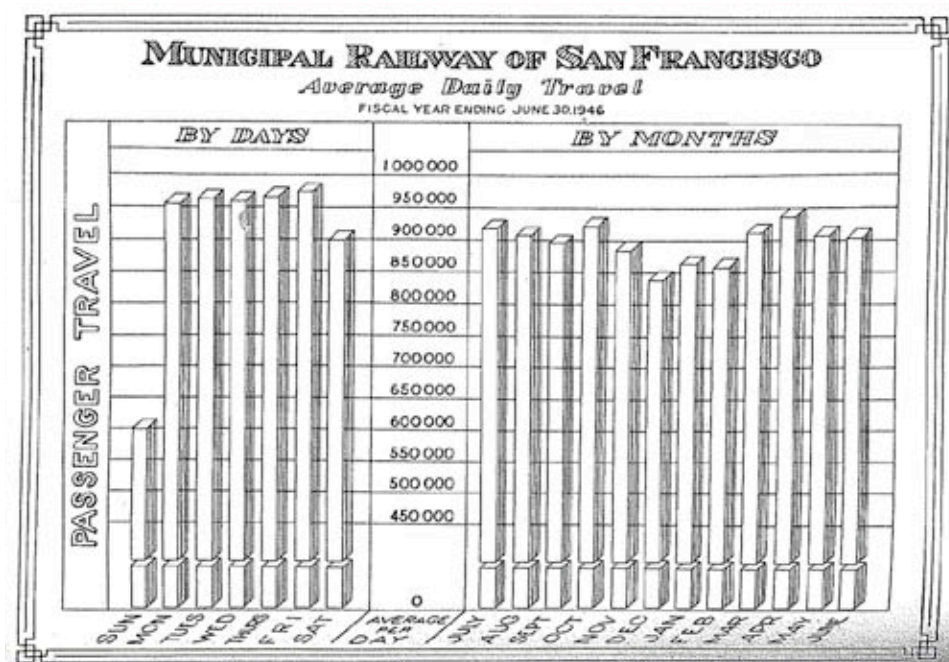
Forecasting models provided by the SFCTA suggest that weekday SFMTA transit ridership could increase by approximately 103,000 by 2015 over 2005 baseline levels with no structural changes to the existing system. The TEP operating budget neutral scenario, which assumes a reorganized route structure but no net service increase, could raise weekday ridership by an additional 72,000, or nine percent, over 2015 baseline levels. In contrast, the TEP enhanced scenario, which represents a net 25 percent service increase, could increase weekday ridership by 132,000, or 14 percent, over 2015 baseline levels.

Currently, transit captures an all-day mode share of approximately 15.4 percent of all trips taken in San Francisco. The operating budget neutral scenario is projected to increase this share by one percentage point, while the enhanced scenario could increase this share by approximately two percentage points. While these numbers appear to be modest improvements, they are actually significant steps in the right direction and underscore the level of service increases that are necessary to achieve GHG reduction targets.

#### **Accelerated Transit Expansion Program**

While the proposed TEP enhanced scenario plan would make substantial improvements, the potential for transit in San Francisco can be even greater. One of the largest impediments to increased ridership is the existing level of service.





*In 1946, transit ridership was approximately 970,000 per weekday*

*Source: Report of the San Francisco Public Utilities Commission, Fiscal Year 1945-1946*

Models indicate that weekday ridership could reach 918,000 under the enhanced scenario of the TEP. In 1946 transit ridership was approximately 970,000 per weekday<sup>45</sup>. While this high ridership level in many ways could be attributable to the conditions at the conclusion of World War II, the fact is that San Francisco's transit system at one point did provide nearly one million passenger trips per day. However, even with this high level of ridership, the transit network back then did not serve as many markets as today. For example, the vast majority of service consisted of radial streetcar routes connecting outlying neighborhoods with Downtown. Very little cross-town service operated west of Fillmore and south of 16<sup>th</sup> Street. Major trip generators such as San Francisco State University and Stonestown Galleria did not exist. There were few connections to regional transit service to the Peninsula and Marin County because these areas had a small population and employment base.

<b>San Francisco Transit Service Levels (Year)</b>	<b>Average Weekday Ridership</b>	<b>Per Capita Ridership</b>
2005	683,000	272
2015 TEP Operating Budget Neutral	858,000	312
2015 TEP Enhanced	918,000	334
1946	970,000	394

These observations suggest that the SFMTA could achieve much higher levels ridership – potentially exceeding one million on an average weekday – and reduce associated GHG emissions. Beyond continuing to encourage employment and residential growth in areas adjacent to high-frequency transit corridors, additional efforts should focus on the following improvements the transit system:

<sup>45</sup> Report of the San Francisco Public Utilities Commission, Fiscal Year 1945-1946



- Currently, almost two-thirds of travel to or from the City's northeast quadrant is on transit, bicycle or foot. The corollary is that nearly one third of travel to the part of the region where transit and walking already have a competitive advantage is made by the automobile. Transit can accommodate some of this automobile travel with additional capacity on currently overcrowded corridors, particularly during peak hours.
- Two thirds of travel within San Francisco outside the northeast quadrant is by automobile. To be more competitive with driving, transit frequency must be increased so that customers experience shorter waiting times. Currently, cross-town travel often involves transferring between routes, which coupled with buses that generally arrive every 15 to 30 minutes, results in travel times that cannot compete with driving.
- SFMTA transit connections to regional services such as BART, Caltrain and Golden Gate Transit must be strengthened to facilitate travel to counties surrounding San Francisco. It can take a half-hour or longer to travel from neighborhoods in central and western San Francisco to reach regional transit service.

Currently the SFMTA provides about 275 transit trips per resident per year. With the major service additions envisioned under the TEP enhanced scenario, ridership could rise to 335 trips per resident per year. While this ridership level would improve upon what is already one of the highest utilization rates in the nation, San Francisco could achieve far more with a larger investment in transit. The most transit-intensive cities in the world have substantially higher ridership rates. The transit system in Zürich, Switzerland, for example, provides approximately 560 trips per resident per year<sup>46</sup>, far above even San Francisco's 1946 rate of nearly 400 trips per resident per year. Approximately 65 percent of residents who live and work in Zürich take transit,<sup>47</sup> over double San Francisco's rate.



*Nearly all streetcar, trolley bus and regular bus routes within the city of Zürich, Switzerland operate every 12 minutes or better until midnight.*

In addition to the vehicular emissions and demand reductions mentioned earlier, meeting GHG emissions targets will require a large mode shift from automobiles to transit supported by a massive transit service

<sup>46</sup> Project for Public Spaces, [http://www.pps.org/info/newsletter/feb08/zurich\\_switzerland](http://www.pps.org/info/newsletter/feb08/zurich_switzerland)

<sup>47</sup> "Zürich: Top City – thanks to light rail", *Tramways & Urban Transit*, April 2005

increase well beyond the 25 percent growth envisioned under the enhanced scenario of the TEP<sup>48</sup>. In particular, the SFMTA must not only increase peak capacity but also off-peak frequency in order to accommodate more discretionary non-work trips.

A comparison to Zürich, which has approximately double the transit utilization rate of San Francisco, illustrates the magnitude of service improvements needed to significantly improve the SFMTA's transit market penetration. Zürich's service intensity, as measured by the level of transit service provided divided by the service area (weekday vehicle miles per square mile), is also approximately double that of San Francisco. Furthermore, in recognition that a high level of service is required to attract discretionary trips to transit, the frequency of service on all major radial and cross-town routes within Zürich city limits is at least every 12 minutes until midnight. In contrast, comparable routes in San Francisco run as infrequently as every 20 to 30 minutes.

	<i>San Francisco</i>	<i>Zürich</i>
<i>Annual Transit Trips Per Resident</i>	272	560
<i>Work Trip Mode Share</i>	31%	65%
<i>Service Intensity (weekday vehicle miles per square mile)</i>	1,800 (budget-neutral TEP) 2,200 (enhanced TEP)	3,800
<i>Weekday Frequency on Core Routes*</i>	3-20 minutes	7½ minutes
<i>Evening Frequency on Core Routes*</i>	10-30 minutes	12 minutes

\* In San Francisco, core routes are the Rapid and Local services defined by the TEP. In Zürich, core routes are nearly all radial and crosstown services within City limits.

#### *Peak-Period Capacity Improvements*

During the peak hours, most SFMTA transit routes run very frequently but they are also approaching maximum capacity. The following map illustrates that peak-period overcrowding is prevalent throughout the system and suggests that these conditions may be hampering additional ridership growth.

- Customer circulation within the vehicle becomes difficult, leading to higher dwell times as people attempt to enter and exit. These delays reduce reliability and can lead to long service gaps. In turn, service gaps result in more customers farther along the route boarding the delayed bus, contributing to even more overcrowding.
- Pass-ups are more likely to occur when vehicles are too full, leading to delayed travel and missed connections.
- Full buses and trains cannot physically accommodate additional customers or can only do so at extreme discomfort, resulting in people choosing to drive.

<sup>48</sup> It is conservatively estimated that the TEP enhanced scenario would decrease the driving mode share and increase the transit mode share by approximately two percentage points.

**Peak Period Crowding of Muni Transit Routes****Peak Load Factors\***

Over 150% (Crush loads)

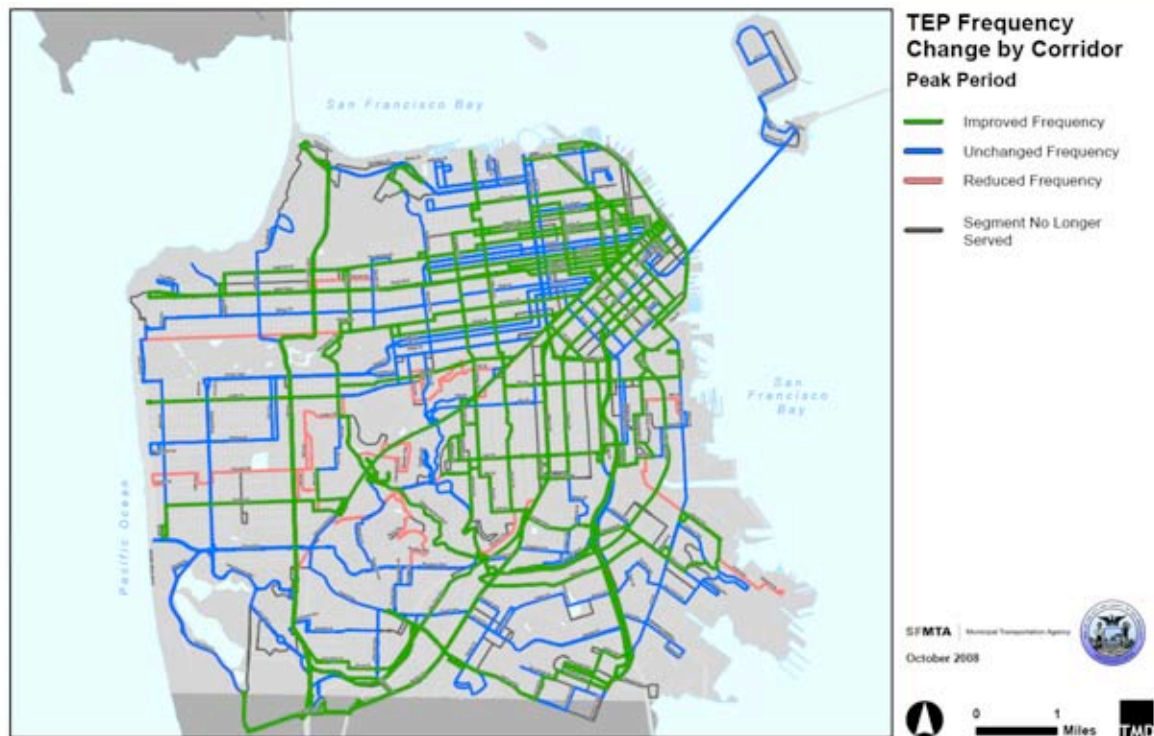
125% to 150% (Moderate crowding)

100% to 125% (Some standees)

\*defined as the number of customers divided by the number of seats available at the busiest point of a route

Both the TEP operating budget neutral and enhanced scenarios include service enhancements on multiple routes that will begin to address existing peak-period overcrowding. The following map illustrates that large portions of San Francisco will receive additional peak-period service under the budget neutral scenario. Additional peak-period capacity beyond the TEP enhanced scenario will likely be required to accommodate a more substantial mode shift from automobiles to transit.





*Proposed Peak-Period Frequency Changes, TEP's Operating Budget Neutral Scenario*

#### *Off-Peak Frequency Improvements (Middays, Evenings and Weekends)*

During off-peak hours, while there are also some capacity constraints, an even greater concern is that service does not run frequently or reliably enough to attract additional customers. The TEP aims to maintain a 10-minute base headway on all Rapid routes. In some corridors where routes overlap, vehicles may come as often as every three minutes. However, most Local routes are planned to operate every 12 to 20 minutes while community routes will operate every 20 to 30 minutes. Evening service on most local routes would operate every 20 to 30 minutes, while on some community routes service would cease after 8:30 p.m.

While the SFMTA under the TEP plan would continue to provide a high level of service compared to other American cities, it may still be too infrequent for people with transportation options. Research has shown that a 10 minute service frequency is often necessary to attract discretionary ridership from people who have other transportation choices. Even a 10 minute service frequency may be insufficient in some parts of San Francisco where parking is more available and a person can drive almost halfway across the City in 10 minutes.

The following maps illustrate current scheduled off-peak levels of service. During the midday, many routes operate every 10 minutes or better. Most parts of the City have access to service at least every 15 minutes, although there are some less frequent services primarily outside the City's northeastern quadrant. In contrast, during the evening hours, there are relatively few routes that run every 15 minutes and only handful that come every 10 minutes or less. During the evening hours it can be substantially more difficult to travel by transit, particularly for trips that require transfers.


**Muni Service Frequency  
Weekday Midday**

- 10 Minutes or Less
- 11- 15 Minutes
- 16 - 20 Minutes
- 21 Minutes or More

**Notes:**

- Some lines have varying midday schedules which are not reflected here.
- Weekend midday service may be less frequent.

**MTA** | Municipal Transportation Agency  
January 2009



0 1 2 Miles


**Muni Service Frequency  
Weekday Evening**

- 10 Minutes or Less
- 11 - 15 Minutes
- 16 - 20 Minutes
- 20 Minutes or More

**Notes:**

- Some lines have varying evening schedules which are not reflected here.
- Weekend evening service may be less frequent.

**MTA** | Municipal Transportation Agency  
January 2009



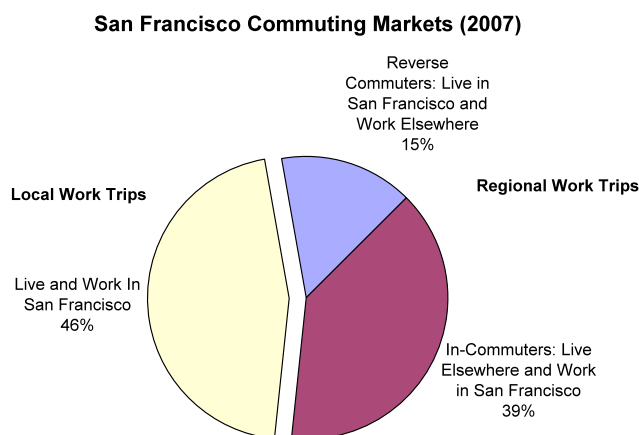
0 1 2 Miles



### Regional Connections

San Francisco is a regional hub of activity and any plans to reduce its transportation sector GHG emissions must take account of its place in the larger Bay Area. In 2007 more than half of workers that traveled within, into or out of San Francisco were regional commuters, including over 265,000 workers who commuted to San Francisco from outside the City and over 100,000 San Franciscans who commuted to jobs in other counties.<sup>49</sup> Among these regional trips transit continues to remain competitive in traditional markets. For example, nearly half of regional in-commuters who work in the Financial District and remainder of San Francisco's northeast quadrant use transit. However, transit's mode share is low in two key markets served by the SFMTA:

- In-commuters who live outside the City and work outside the City's northeast quadrant, a market of about 80,000 people
- Reverse commuters who live in San Francisco and work in the South Bay or along the Peninsula, a market of about 60,000 people



Source: American Community Survey 2007, U.S. Census Bureau

### Transit Mode Shares Regional Commuters

In-Commuters (265,000) Transit Mode Share <i>Live Elsewhere and Work in San Francisco</i>	Reverse-Commuters (100,000) Transit Mode Share <i>Live in San Francisco and Work Elsewhere</i>
Work in the Northeast Quadrant – 47%	Work in the South Bay/Peninsula – 9%
Work elsewhere in San Francisco – 15%	Work in the East Bay – 23%

Source: American Community Survey 2007, U.S. Census Bureau and 2000 Census data

One of the reasons why transportation-related GHG emissions have increased in San Francisco has been the rapid growth of regional commuting. Between 1990 and 2000, for example, the number of San Franciscans commuting to jobs in the South Bay or along the Peninsula grew by 46 percent.<sup>50</sup> While it is more difficult for transit to be competitive for these types of regional trips there are a couple of ways transit can become more attractive and improve its market share.

**Regional Fare Integration:** There are 27 different transit providers in the Bay Area, each one having its own fare structure and transfer arrangements. Some examples of complete fare integration do exist. For instance, the SFMTA's FastPass is valid on BART within San Francisco and is a popular program that generates 12 million boardings per year. On the Peninsula, Caltrain customers who have passes for trips of

<sup>49</sup> American Community Survey 2007, U.S. Census Bureau

<sup>50</sup> U.S. Census Bureau, 2000 data

two or more zones may travel free on SamTrans and the Santa Clara Valley Transportation Authority (VTA) system. Fare agreements like these are particularly beneficial for the customer and for overall regional mobility, but have financial impacts on the participating transit agencies.

Nevertheless, the general lack of fare coordination presents barriers to riding transit. Thus, while the SFMTA offers one of the least expensive monthly passes in the nation at \$45, a commuter from Oakland to San Francisco may pay upwards of \$250 per month to ride AC Transit, BART and SFMTA services. Although the MTC has been developing the TransLink® regional smart card to simplify fare payment, no new inter-agency fare coordination policies are currently planned for implementation under TransLink®. Attempts at further regional fare integration<sup>51</sup> have not advanced because individual transit agencies would potentially forgo some revenue. Achieving fare coordination and realizing the resulting ridership and climate change mitigation benefits will require additional funding sources so that operators can be made whole.

*Improved Reverse Commute Service to the Peninsula:* With the introduction of Caltrain's Baby Bullet commute period trains in 2004 one can travel from the 4<sup>th</sup> & King or 22<sup>nd</sup> Street Caltrain Stations to San Jose in less than an hour.<sup>52</sup> Travel times from 4<sup>th</sup> & King to Redwood City, Palo Alto and Mountain View are just 30 minutes, 37 minutes and 45 minutes, respectively. Faster service has contributed to significant ridership gains. Since 2002 average morning peak ridership at San Francisco stations has increased over 55 percent, from 1,738 to 2,708.<sup>53</sup>

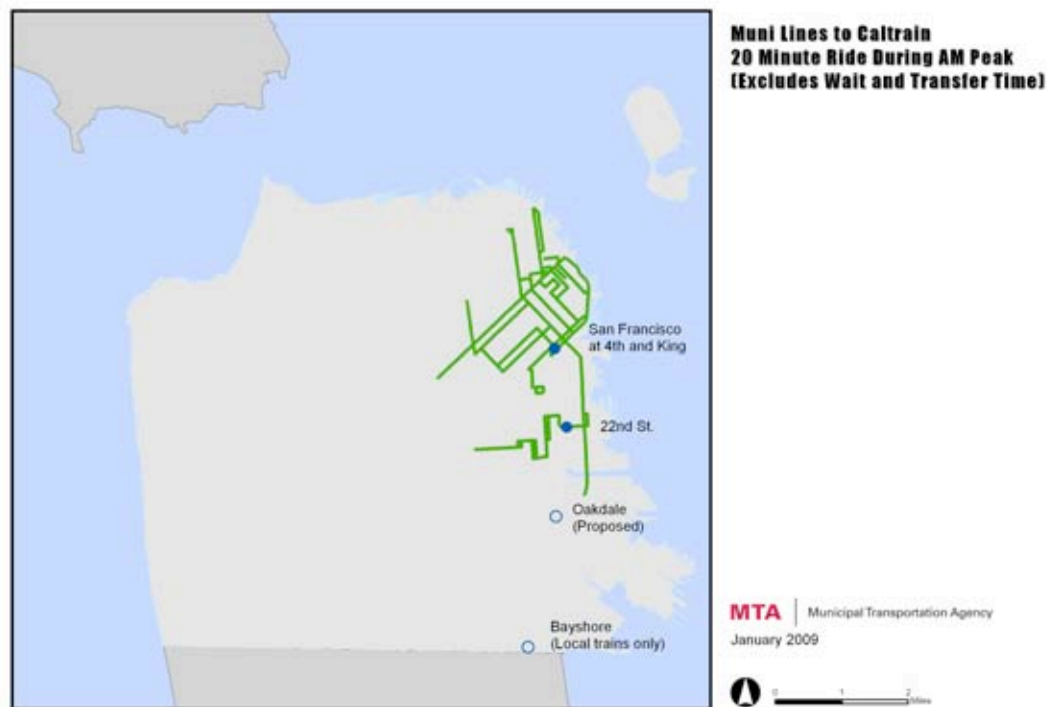
Getting to the 4<sup>th</sup> & King or 22<sup>nd</sup> Street Stations on transit from San Francisco neighborhoods, however, remains time consuming and a significant impediment to even larger ridership gains. These stations, as well as the Bayshore Station by the San Mateo County line, are all located near the eastern waterfront, requiring long bus or rail rides to the neighborhoods where commuters live. The following map illustrates what portion of San Francisco is accessible to Caltrain within a 20-minute transit ride, excluding transfer and wait times.

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<sup>51</sup> Per a Regional Measure 2 legislative requirement, the TransLink® consortium members submitted an Integrated Fare Study report to the legislature in June 2008. This report investigated only a revenue-neutral integrated fare instrument and concluded that it would not result in significant ridership gains.

<sup>52</sup> Local reverse-commute service also stops at the Bayshore Station near the San Mateo County border, but trains arrive only once per hour and travel times are much longer to the Peninsula and South Bay.

<sup>53</sup> Caltrain Annual Passenger Counts, February 2002 and February 2008



The Transbay Terminal, located adjacent to the Financial District at 1<sup>st</sup> and Mission Streets, is scheduled to be rebuilt beginning in 2009. The first phase of the project will include the construction of a temporary terminal and a new transit center for regional buses. The second phase, which is scheduled for completion in 2019 if funding is secured, would accommodate a new Caltrain terminal and potentially high-speed rail trains to the Central Valley and Southern California. If this phase of the project advances, it would greatly enhance Caltrain's utility by providing walkable connections to BART, Golden Gate Transit, AC Transit and major SFMTA bus and rail lines.

In the meantime, opportunities may exist for express bus connections to Caltrain from neighborhoods with large numbers of southbound commuters, such as the Haight Ashbury, Western Addition, Castro, Noe Valley and the Mission. In addition, the City should continue to support large employers along the Peninsula and in the South Bay who have established private deluxe motor coach shuttles to transport workers directly from San Francisco neighborhoods to their offices.

In February 2005 the SFCTA completed a study that examined the feasibility of adding a Caltrain station at Oakdale Avenue adjacent to the Bayview neighborhood. Construction of the Oakdale station would improve access to Caltrain from the southeastern corner of the City and could potentially provide access to other neighborhoods through connections with three Muni bus routes.

BART also connects with Caltrain at Millbrae, enabling commuters who live in areas such as the Mission District and Glen Park to reach the Peninsula and South Bay. However, while the physical connection between BART and Caltrain exists, there are several impediments to ridership growth. First, if one does not live adjacent to BART, riding Muni to BART to Caltrain requires two transfers, which increases travel times

and introduces the potential for missed connections. Because Caltrain's Baby Bullet trains stop at selected Peninsula and South Bay stations as infrequently as every hour, missing a train could result in long delays. Secondly, BART and Caltrain fares are currently not coordinated and may be too high to compete with automobile travel. A combined BART-Caltrain monthly fare from 16<sup>th</sup> Street Mission to Palo Alto, for example, exceeds \$265.<sup>54</sup> This issue could conceivably be addressed with an integrated regional fare structure.

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<sup>54</sup> Caltrain's monthly fare from Millbrae to Palo Alto is \$112.75. BART's monthly fare from 16<sup>th</sup> Street Mission to Millbrae, assuming 21 round trips per month and a 6.25 percent discount for high volume purchases, is approximately \$155 based on a \$3.95 one-way fare.

## **VII. FUNDING**

Implementing the measures to achieve the City's transportation sector GHG emission reduction targets – and achieve ancillary transportation and mobility benefits – will require substantial unidentified capital and operating resources. While a detailed budget has yet to be developed for most of the proposed initiatives, an order of magnitude calculation suggests that operating costs could be hundreds of millions of dollars annually and that capital costs could also be hundreds of millions of dollars. On the other hand, incremental revenue from candidate initiatives such as *SFpark* and Congestion Pricing would likely be in the tens of millions of dollars range. Some proposed initiatives, such as reducing emissions through the introduction of electric private vehicles, would likely have minimal direct net capital or operating financial impacts on the SFMTA; however, purchasing such vehicles would cumulatively cost individual citizens and businesses tens of billions of dollars. While the financial costs of mitigating climate change appear to be very high, they may be even higher if no efforts are undertaken to curb GHG emissions.

### **Financial Impacts of Major Proposed Initiatives**

Initiative	Potential Financial Impact
<b>A. Vehicular Emissions Reduction</b>	
Transit vehicles including non-revenue vehicles	Procurement costs: \$500,000-\$1 million capital cost per bus; <sup>55</sup> \$3-\$4 million per rail vehicle; \$20,000-\$500,000 per non-revenue vehicle
Non-transit vehicles	Capital costs to install plug-in chargers for electric vehicles could potentially be recouped through user fees. Minimal direct net capital or operating costs to the SFMTA, but would cumulatively cost individual citizens or businesses tens of billions of dollars to purchase new private vehicles
<b>B. Vehicular Demand Reduction Measures</b>	
Transit-Oriented Development (TOD)	Minimal direct capital or operating costs to the SFMTA; some TOD costs may be supported by the MTC's Transportation for Livable Communities program or other grant programs; TOD may generate additional tax revenues to support transportation and other City programs
<i>SFpark</i>	\$100 million or less to implement citywide (partially funded by federal Urban Partnership Program grant); could generate an incremental \$10 million or more annually in parking revenues
Congestion Pricing	Capital costs undetermined but could be partially offset by a grant; could generate a net of \$35 million to \$65 million for transportation purposes after administrative costs are covered
Bicycling and Pedestrian Improvements	Relatively small capital costs and minimal operating costs to the SFMTA.
Other Vehicular Demand Reduction Strategies (carsharing, parking cash out, universal transit passes)	Relatively small direct capital and operating costs, although additional resources may be required if service is increased to accommodate ridership generated through these programs
<b>C. Major Transit, Bicycling and Pedestrian Improvements</b>	
Bicycling and Pedestrian Improvements	Relatively small capital costs and minimal operating costs to the SFMTA
Transit Effectiveness Project Operating Budget Neutral Scenario	\$200 million capital costs; minimal incremental operating costs

<sup>55</sup> Hybrid buses cost roughly \$500,000 each; trolley buses cost roughly \$850,000 each and fuel cell buses currently cost roughly \$2.5 million each. The industry target for the cost of fuel cell buses in a large procurement is roughly \$1.0 million each. For comparison, conventional diesel buses cost roughly \$350,000 each. Full-size battery-electric buses are still emerging but should be comparable in cost to hybrid buses.



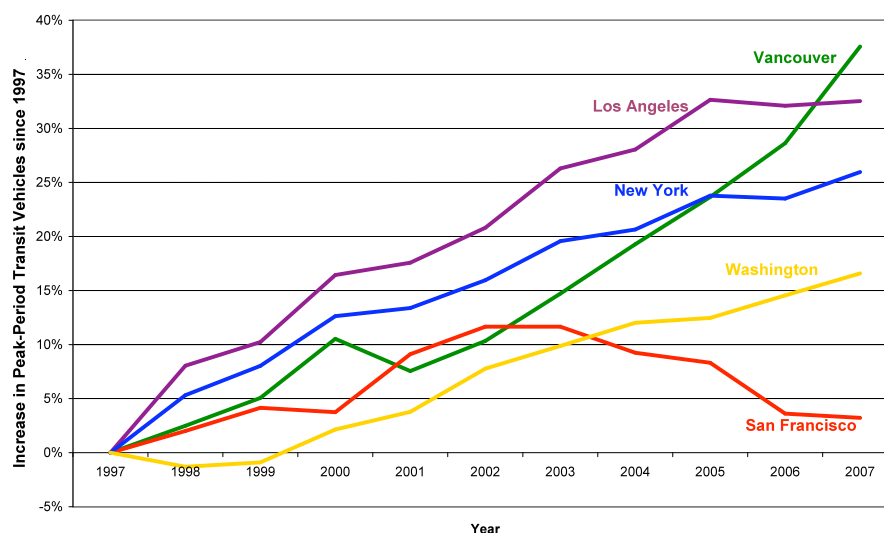
Transit Effectiveness Project Operating Budget Neutral Scenario	\$200 million capital costs; minimal incremental operating costs
Transit Effectiveness Project Enhanced Scenario	Capital costs undetermined; \$150 million annual operating costs partially offset by additional fare revenue from ridership gains
Accelerated Transit Expansion Program	Capital costs undetermined; \$300 million or more in annual operating costs above the TEP Enhanced Scenario (depending on the level of service offered) partially offset by additional fare revenue from ridership gains

The SFMTA's largest expenditure and most direct impact on the transportation system involves providing Muni transit service. The level of service that SFMTA can offer – both in terms of overall service hours (including off-peak service) as well as the maximum capacity as measured by peak vehicles – is directly related to capital and operating funding. In turn, ridership and the resulting reduction in GHG emissions are strongly influenced by the level of transit service provided. The following charts illustrate the relationship between service provided and ridership in San Francisco and several other North American cities since 1997.

San Francisco's service slightly increased over the past decade, but rose 6.5 percent in FY 2007-08. Lower ridership does not imply that nothing has been done to improve transit. On the contrary, many rail and trolley bus extensions, a new maintenance and operations facility and other major infrastructure investments have been completed or are planned, as noted in Section V. Further, the long term ridership loss may be partially attributable to economic conditions, the growth of reverse commuting by automobile and the inability to fund major service enhancements that would relieve peak-period overcrowding and offer additional off-peak service when demand is high.

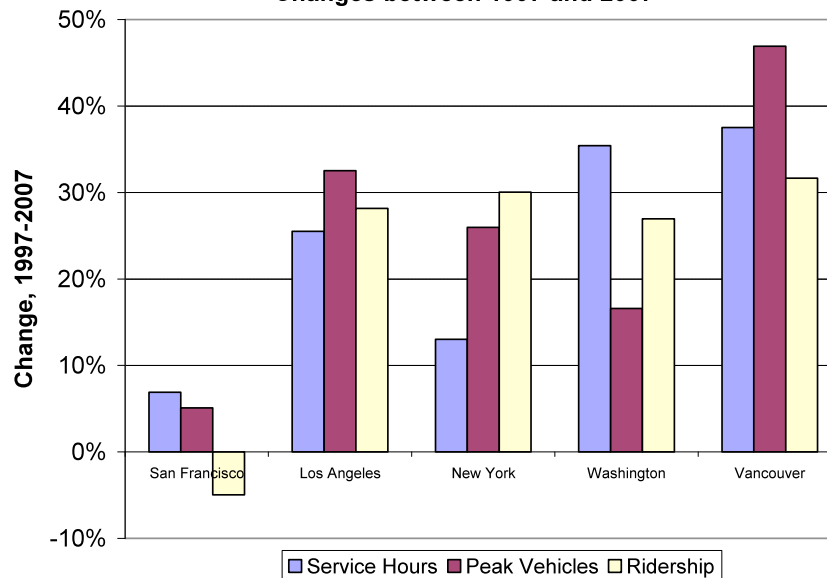
While the specific circumstances impacting service and ridership vary from city to city, the data nevertheless strongly suggest that transit systems that have managed to sustain large increases in peak capacity and in transit service overall have also experienced substantial ridership growth. Potentially even larger ridership gains could have been realized with strong vehicular demand reduction measures in these cities. The corollary also appears to be valid as it is difficult to sustain major ridership growth without significantly increasing the level of transit service offered.

**Change in Peak-Period Transit Vehicles, 1997-2007**



### Transit Service and Ridership

Changes between 1997 and 2007



Source: National Transit Database

Various Translink Transportation Plans and Annual Reports (Vancouver)

Note: San Francisco's ridership includes the 6.5% growth most recently recorded between FY 2006-2007 and FY 2007-2008.

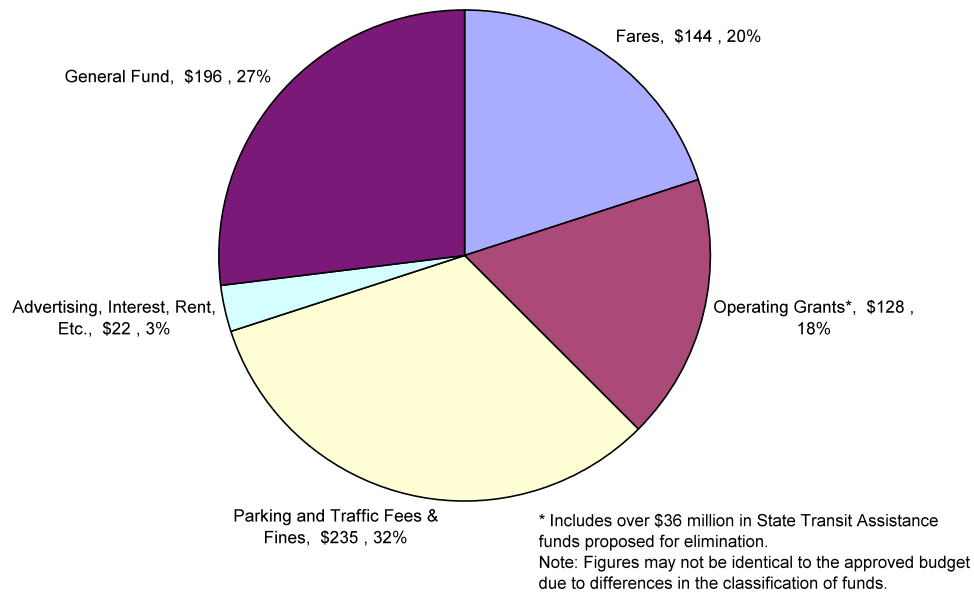
### Operating Funding Capacity

The SFMTA has one of the most diverse sources of funding for day-to-day operations among large transportation organizations. It receives major support from transit fares, parking and traffic fees and fines, operating grants from a variety of state and local sources and San Francisco's General Fund. Over 80 percent of the SFMTA budget is currently generated at the local level – primarily through fares, parking and the City's General Fund. The SFMTA receives limited federal operating assistance to cover the capital cost of contracting for operating paratransit service, taking advantage of federal legislation that allows transit systems to defray van purchases and other capital costs encumbered by paratransit contractors. The remainder of funding (16 percent) is provided by the State of California through state sales and gas tax monies statutorily reserved for transit operations.

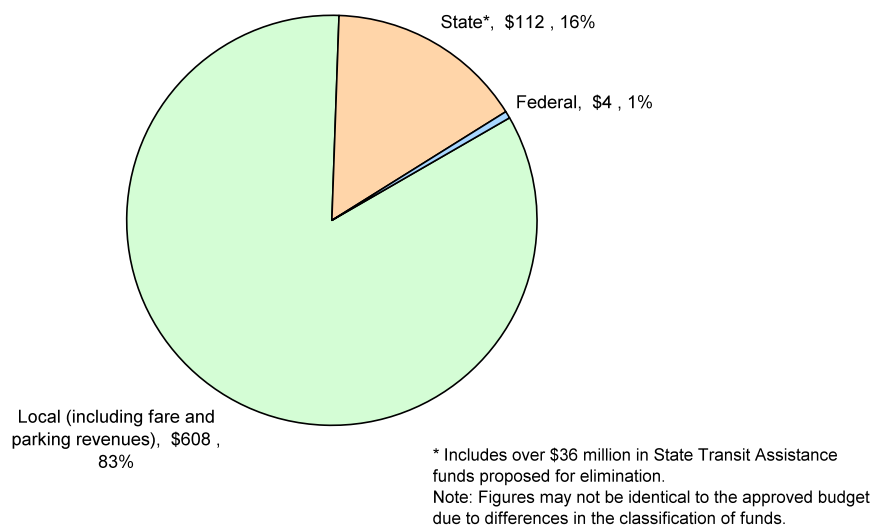
#### *Immediate Operating Budget Shortfall*

The SFMTA is currently facing a mid-year \$40 million operating shortfall that threatens its ability to maintain existing services, let alone to implement the initiatives necessary to achieve GHG emissions targets. To help address this deficit, the SFMTA is freezing more than 400 vacant positions and most hiring outside of transit operations has been deferred. The SFMTA is also exploring cost cutting in other areas such as maintenance, contracting, rent and supplies while endeavoring to generate more revenues, possibly from advertising and parking fees.

### SFMTA Operating Revenue Sources by Funding Type Adopted FY 2008-09 Operating Budget (millions)



### SFMTA Operating Revenue Sources by Funding Origin Adopted FY 2008-09 Operating Budget (millions)



### *State Funding Cutbacks*

Having a diverse funding base would normally provide a cushion against a decline in any one source, but the current economic crisis has impacted revenues at all levels, including critical state transit assistance funds. Currently the SFMTA receives over \$36 million in State Transit Assistance (STA) funds, a large amount of funding resources for transit service and other transportation programs.

Over the past several years operating funding from the STA program has been diverted to other uses and most recently threatened with cutbacks. The STA is the only ongoing source of state funding for local public transportation operations. STA funds originate from a variety of sources, including sales taxes on gasoline which are statutorily dedicated to transit and other transportation operating and capital projects under Proposition 42, which was passed in March 2002. The STA program is also funded by spillover revenues generated when the sales tax on gasoline increases at a faster rate than all other taxable items. Spillover funding was designed to enable transit agencies to cover their own fuel costs and to provide additional service for motorists seeking alternatives to high gasoline prices. Until the second half of 2008 spillover revenues had been rising rapidly due to a multi-year escalation of gas prices.

Over the past several years, significant amounts of state transit funds have been diverted to the state's General Fund. For example, the FY 2007-08 state budget diverted \$1.26 billion away from transit. The most immediate cause of the SFMTA's mid-year financial crisis is Governor Schwarzenegger's proposal to scale back the already diminished STA program and then eliminate it altogether in order to address a state budget crisis. . The Governor has called for a \$230 million cut to STA funds, a 75 percent reduction from September's allocation of \$306 million, and the complete elimination of the program beginning in 2009-10.

While the State legislature has resisted eliminating the program altogether, it is proposing to reduce the STA program by over 50 percent to \$150 million per year statewide, equivalent to less than a \$5 contribution from every Californian. The earlier allocation of \$306 million itself represented a diversion of 84 percent of available transit funding to cover non-transit holes in the state General Fund. If enacted, the plan would result in a total 2008-09 diversion of more than \$1.8 billion in revenues created by voters through a series of statewide initiatives specifically for public transit funding.

Clearly, the most immediate short-term funding priority is to ensure the continuation of state transit funding. Without this funding, the SFMTA may be forced to eliminate transit routes and/or reduce service frequency, making it impossible to comply with state GHG emission reduction targets.

A second major concern relates to the SFMTA revenues received from the City's General Fund. Passed by San Francisco voters in November 1999, Proposition E formed the SFMTA out the San Francisco Municipal Railway, Department of Parking and Traffic and Parking Authority. Proposition E set a funding level for the SFMTA based on the General Fund allocations then received by those independent agencies. For subsequent years, it tied funding adjustments to the percentage increase or decrease in aggregate City discretionary revenues. With the current national economic situation, the City's General Fund revenues have decreased, which in turn has decreased funding available to the SFMTA.

### *Long-Term Structural Operating Budget Challenges*

The SFMTA's local mixture of operating funding sources, including transit fares, parking and traffic collections and fines and General Fund revenues provides over 80 percent of operating revenue, or more than \$600 million annually. These sources have not proven to be sufficient to support SFMTA transportation programs and the current national economic downturn is likely to exacerbate the situation.

In particular, San Francisco's General Fund provides an important source of revenue for the SFMTA, comprising over one quarter of the operating budget. However, as currently structured, the General Fund is

unlikely to be able to fund significant increases in transit service and other potential climate change mitigation measures administered by the SFMTA. Proposition E's provision that adjusts City contributions based on changes to total General Fund revenues essentially allows the SFMTA to grow or shrink based on the state of the economy. When the economy is weak, SFMTA's funding may be reduced, which may lead to transit service reductions, fare increases and cutbacks to bicycle, pedestrian and other programs. Even when the economy is strong, the net revenue increase, after adjusting for inflation, may only be a few percentage points. Furthermore, as the economy has historically been cyclical, it is unlikely that net inflation-adjusted revenue growth can be sustained over time.

Passed by San Francisco voters in November 2007, Proposition A amended Proposition E to include additional supplemental operating revenues. SFMTA now retains 80 percent of parking tax receipts and 100 percent of additional revenues generated from changes in parking policy and enforcement. Previously the SFMTA had been allocated 40 percent of parking tax receipts and 50 percent of additional parking revenues, with the remainder going to the General Fund. These provisions are estimated to generate approximately \$26 million annually.

The SFMTA is working to identify new operating revenues. In 2007 Mayor Gavin Newsom's Revenue Panel was convened to discuss potential funding options consisting of representatives from various City departments, the Mayor's Office, the MTC and the SFMTA Board of Directors. Funding sources that have been discussed include a hotel tax, sales tax, motor vehicle license fee and a transit impact fee/assessment district. While none of these sources alone is likely to generate all of the funding needed to achieve transportation sector greenhouse gas emissions targets, in combination with other sources such a new revenue-producing measure may be able to generate substantial resources to begin to implement improvements that will reduce automobile use.

### **Capital Funding Capacity**

For FY 2008-09 the SFMTA budgeted to receive approximately \$250 million in capital funding for vehicle replacements, operating and maintenance facilities, system modernization and other state of good repair needs. A little over a quarter of this funding originates from the federal government through formula programs (Sections 5307 and 5309) administered by the FTA. Unless funds are diverted, a similar amount is projected to come from the State's Transportation Improvement Program (STIP) and State Transportation Infrastructure Bonds (Proposition 1B) passed by California voters in November 2006. The remainder of capital funding is assumed to come from matching local sources, primarily through Proposition K.<sup>56</sup>

The FTA also provides New Starts Funding for large transit investments throughout the United States. However, this funding is limited - less than \$1.6 billion nationwide per year. In FY 2009 two new rail projects were awarded New Starts funds. The multi-year grant application process requires cities and regions across the country to meet stringent criteria and compete against one another for funding. The SFMTA received a Medium High evaluation rating from the FTA for the proposed Central Subway, making it eligible for a grant award pending final federal approval.

The SFMTA's existing capital program is currently underfunded. The SFMTA has identified annual capital needs of at least \$600 million over the next several years, resulting in funding shortfalls of as much as \$400 million each year.

### **Potential Revenue Sources**

The following section discusses several potential revenue sources.

- Mayor Gavin Newsom's Revenue Panel funding sources – The panel, which explored various

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<sup>56</sup> Amounts of Proposition K funds allocated to capital needs depend on the matching fund requirements of individual projects.



options including a hotel tax, sales tax, motor vehicle license fee and a transit impact fee/assessment district to fund transit operations, has not yet determined which potential sources to advance.

- **Fares** – The SFMTA Board has approved a fare increase on monthly passes for July 1, 2009. Adult Fast Passes will increase from \$45 to \$55, while discount passes for seniors, persons with disabilities and youths will increase from \$10 to \$15. This is expected to raise total revenues by nearly \$20 million. The SFMTA Board has also approved subsequent fare increases tied to inflation levels. Fares currently fund approximately 20 percent of SFMTA's operating budget. Thus, large fare increases cannot be expected to generate huge amounts of revenue needed either to replace state funding threatened for elimination or to expand service. However, large fare increases would likely result in significant ridership losses.
- **Federal Operating Assistance** – In November 2008 the American Public Transportation Association (APTA) and the Community Transportation Association of America advocated for the reintroduction of federal operating assistance: "With so many states facing severe budget deficits and rapid declines in sales and property tax revenues due to the failing economy, provide operating aid to transit agencies to help speed the recovery of the economy and stabilize America's public transportation systems."<sup>57</sup> Federal operating assistance was once a major source of funding for transit systems nationwide. Two years after U.S. transit ridership reached an all-time low, and in the midst of the first energy crisis, the National Mass Transportation Act of 1974 established federal support for transit operating costs. As recently as FY 1981-82, Muni received \$14 million in federal operating assistance<sup>58</sup> (\$33 million in current dollars). During the 1980s and 1990s, however, federal operating assistance declined in real terms and by the late 1990s was phased out for urbanized areas with populations greater than 200,000.
- **Federal Paratransit Operating Assistance** - The decline of federal operating assistance has been compounded by well-intentioned but unfunded federal mandates. Beyond providing accessible transit vehicles and facilities, transit systems must offer door-to-door paratransit service for eligible persons with disabilities under the 1990 Americans with Disabilities Act. Comprising roughly one percent of ridership, SFMTA's contracted paratransit program costs exceed \$20 million per year. Without additional funding, transit systems have struggled to effectively meet the needs of people with disabilities while providing adequate service for their communities as a whole.
- **Federal Capital Assistance** – The incoming administration has expressed interest in stimulating the economy, creating employment and protecting the environment through infrastructure projects. This presents opportunities to secure additional funding for new vehicles, rail extensions, the replacement and establishment of new operating and maintenance facilities and other major transit investments.
- **SFpark** – Currently the SFMTA collects slightly over \$30 million in revenues from on-street parking meters and another \$35 million from City-owned parking garages. The variable pricing of parking under SFpark could generate an incremental \$10 million or more annually in parking revenues. While this would provide an important supplemental source of revenue, the primary purpose of SFpark is to better manage the City's limited parking supply that is currently oversubscribed.
- **Congestion Pricing** – The SFCTA anticipates that a congestion pricing program could generate a net of \$35 million to \$65 million annually for undetermined transportation purposes after administrative costs are covered. This projection assumes a congestion fee of \$3 per vehicle during peak hours. Like the SFpark program, congestion pricing could provide an important supplemental source of revenue, but in and of itself is unlikely to generate the level of funding needed to implement the climate change mitigation measures described in this report.
- **Tax Increment Financing** – Improvements to transit services can raise the values of residential and business properties by providing enhanced access. Tax Increment Financing (TIF) is a method of raising revenues to pay for these transit improvements by capturing a portion of tax revenues that

<sup>57</sup> A Policy Agenda For Public Transportation, Presented to the Transportation Transition Team of President Elect Barack Obama, November 25, 2008

<sup>58</sup> San Francisco Municipal Railway Short-Range Transit Plan, 1984-1989

result from property value increases.

- **Cap and Trade** – Cap and Trade is an approach that could be used to control GHG emissions. Under Cap and Trade, the local, state or federal government would cap the amount of CO<sub>2</sub> and subsequently gradually reduce the amount that can be emitted. Companies would be issued emission permits and would either sell or buy credits, depending on whether they emitted less or more than their emission quota. The total amount of permits would represent the total amount of acceptable emissions. A portion of revenues from the buying of credits could partially fund transit and other programs that reduce these emissions.
- **Carbon Tax** – A carbon tax would directly impose a fee on the emission of CO<sub>2</sub>, potentially with the fee increasing over time to encourage emissions reductions. Revenues from this tax could support transit and other emissions reductions programs.

Given the magnitude of additional resources needed to support transportation sector greenhouse gas reduction programs, it is likely that multiple sources of funding, including ones not previously discussed, will need to be secured. At the local level, there remain multiple opportunities to raise additional revenues for enhancements to the transportation system. As climate change is a problem that extends beyond the City's and the region's boundaries and is a national (and international) concern, funding will also likely need to come from the state and federal level. The success of the SFMTA's ability to deploy the strategies and recommendations detailed in this plan will be contingent on identification of adequate resources. If the SFMTA cannot secure necessary resources, this will undoubtedly impact plan implementation.

### **VIII. SUMMARY AND CONCLUSIONS**

The City and County of San Francisco recognizes the significant challenge posed by climate change, and the SFMTA is prepared to contribute to the solution by examining agency operations as well as its role in the transportation sector. The Mayor has established the goal of a 20 percent reduction below 1990 levels in GHG emissions by 2012 for City departments, and Proposition A sets this same goal for the transportation sector. The SFMTA has launched a variety of initiatives to reduce the carbon footprint of its facilities and operations, including using lower emission vehicles and fuels in addition to the already extensive network of electric vehicles. It has also implemented multiple programs to increase transit ridership and encourage sustainable modes of transportation by integrating developments in information technology and customer-focused services. These efforts must be combined with vehicle demand reduction and a passenger car mode shift to greener vehicles.

The time to act is now. With rising emissions from the United States and even greater rates of emission increases from developing countries, it is the responsibility of those cities at the forefront of innovation and responsible governance to actively address global climate change. Given that approximately half of San Francisco's GHG emissions come from the transportation sector, shifting people to transit, walking, bicycling and other sustainable transportation modes can contribute to this effort. Ultimately, success will require government policies and funding that encourage:

- Reduced personal vehicle travel
- Massive production and use of cleaner vehicles
- Substantial increases in public transit, bicycles and walking
- Development of dense land use patterns that support non-auto modes of travel

**ACRONYMS**

AB 32	California Assembly Bill 32, formerly called California Global Warming Solutions Act of 2006.
AB 118	California Assembly Bill 118, created the Energy Commission's Alternative and Renewable Fuel and Vehicle Technology Program.
AB 939	Assembly Bill 939 to begin diverting recyclable waste materials from ever growing landfills.
AC Transit	Alameda Contra Costa County Transit District
AFPP	Alternative Fuel Pilot Program (SFMTA 2001-2003)
ARS	Annual Recycling Survey
AVL	Automatic Vehicle Location system
B20	Biodiesel – B20 is a 20% blend of biodiesel with 80% conventional diesel
BART	Bay Area Rapid Transit
BAAQMD	Bay Area Air Quality Management District
BOS	Board of Supervisors
BTU	British Thermal Unit
CAFÉ	Corporate Average Fuel Economy
Caltrans	California Department of Transportation
CAP	SFMTA Clean Air Plan – Zero Emission 2020
CARB	California Air Resources Board
CCSF	City and County of San Francisco
CEC	California Energy Commission
CMAQ	Congestion Mitigation and Air Quality (FTA)
CNG	Compressed Natural Gas
CO <sub>2</sub>	Carbon Dioxide
DPH	Department of Public Health
DPT	Department of Parking and Traffic
DPW	Department of Public Works
DTIF	Downtown Transportation Impact Fee
DWA	Department Waste Assessment
F	Fahrenheit
FC	Fuel Cell
FTA	Federal Transit Administration
GHG	Greenhouse Gas
GPS	Global Positioning System
H <sub>2</sub>	Hydrogen
HD	Heavy-duty (vehicle)
HOV	High Occupancy Vehicle
LED	Light Emitting Diode
LEED	Leadership in Energy and Environmental Design, standard for Green Building Design
LNG	Liquid Natural Gas
LRV	Light Rail Vehicle
MD	Medium duty (vehicle)
MECA	Mayor's Energy Conservation Account
MTC	Metropolitan Transportation Commission
Muni	San Francisco Municipal Railway
NOx	Oxides of nitrogen
ppm	Parts per million (ppm)
PUC	Public Utility Commission
RCO	Resource Conservation Ordinance
RCP	Resource Conservation Plan

SamTrans	San Mateo County Transit District
SB 375	California Senate Bill 375, links land use planning with global warming.
SFCTA	San Francisco County Transportation Authority
SFE	SF Environment – San Francisco Department of the Environment
SFMTA	San Francisco Municipal Transportation Agency
SFO	San Francisco International Airport
SMS	Short message service
SOP	Renewable Energy Standard Offer Program. Promotes energy efficiency; also Standard Operating Procedure
SUV	Sport Utility Vehicle
SRTP	Short Range Transit Plan
TA	Transportation Authority (SFCTA)
TDM	Transportation Demand Management
TEP	Transit Effectiveness Project
TFV	Transit Fleet Vehicle
TOD	Transit Oriented Development
USDOE	United States Department of Energy
VMT	Vehicle Miles Travelled
VTA	Santa Clara Valley Transportation Authority
WETA	Water Emergency Transportation Authority
ZEB	Zero Emission Bus
ZEV	Zero Emission Vehicle



**APPENDIX A - SFMTA INTRODUCTION**

The following section is included for format consistency with citywide climate action plan categories.

**Mission**

The San Francisco Municipal Transportation Agency (SFMTA) is the City's umbrella transportation agency, including both the Municipal Railway (Muni) and the Division of Parking and Traffic (DPT), formerly the Department of Parking and Traffic). The SFMTA mission is "...providing timely, convenient, safe and environmentally friendly transportation alternatives. SFMTA enhances the quality of life of San Francisco." The SFMTA is responsible for planning, design and operation of: public transit and paratransit service/facilities, bicycle and pedestrian facilities, traffic and parking (both on-street parking and off-street facilities and parking enforcement). Taxis will join the SFMTA in March 2009.

**Employees and Budget**

SFMTA has 4,865 employees and has an annual operating budget of about \$790 million. Table 1 provides the FY 2007-08 budgeted positions by division.

**SFMTA Employees by Division**

<b>Division</b>	<b>Budgeted Positions FY 2008 (approx)</b>	<b>Percent of Total</b>
Muni Service Delivery and Operations	3,575	73%
External Affairs	115	2%
Technology Planning	38	1%
Transportation Planning & Development	236	5%
Finance & Information Technology	155	3%
Executive Office	8	0.2%
Human Resources	72	2%
Security and Enforcement	485	10%
Parking & Traffic/Parking Authority	180	4%
Total	4,865	100%

Muni operates public transportation in the City and County of San Francisco. It is the Bay Area's largest transit operator and eighth largest in the country, based on ridership. Muni carries roughly 700,000 trips every weekday (about 220 million trips per year).

**Facilities**

SFMTA facilities include:

**Muni operating/maintenance divisions**

- Kirkland Division
- Woods Division
- Flynn Division
- Islais Creek Division (future)
- Potrero Division
- Presidio Division
- Green Division
- Green Annex
- Geneva Yard and Shop (with Upper Yard)

- Cable Car Barn
- Metro East

Muni Operations Control

- Central Control

Non-revenue Vehicles

- Scott Division

Maintenance Facilities

- 1401 Bryant/2502 Alameda
- Power Control Center
- 700 Pennsylvania
- 1399 Marin Street
- Burke Avenue warehouse

Administrative Offices

- 875 Stevenson
- One South Van Ness
- 401 Van Ness

**Partners**

SFMTA works with numerous partners and funding agencies. Key local oversight, funding and partner agencies include:

- Mayor's Office
- Board of Supervisors
- City Controller
- San Francisco County Transportation Authority
- Peninsula Corridor Joint Powers Board (Caltrain)
- Transbay Joint Powers Authority
- Metropolitan Transportation Commission
- Mayor's Office of Emergency Services
- Mayor's Office on Disability
- San Francisco Department of the Environment
- San Francisco Fire Department
- San Francisco Planning Department
- San Francisco Police Department
- San Francisco Department of Public Health
- San Francisco Department of Public Works
- San Francisco Recreation & Park Department
- San Francisco Redevelopment Agency
- Port of San Francisco
- Association of Bay Area Governments
- Bay Area Air Quality Management District
- Public Utilities Commission
- Bay Area Transit District
- Alameda Contra Costa Transit District
- Golden Gate Bridge, Highway & Transportation District
- San Mateo County Transit District
- Santa Clara Valley Transportation Authority
- WETA

The SFMTA sponsors and meets with a number of citizens advisory committees. The SFMTA also works closely with dozens of community organizations, including schools, neighborhood associations and community advocacy groups.

Labor unions play an important role at the SFMTA. Seventeen unions represent about 4,800 employees, ranging from Transport Workers Union Local 250A, which represents the approximately 2,200 Muni operators, to the Glaziers Local 718, which represents five employees. Work rules and compensation for these employees are governed by collective bargaining agreements between the unions and the SFMTA.

**APPENDIX B – STATE CLIMATE CHANGE LEGISLATION****AB 32:**

California Assembly Bill 32, formerly called California Global Warming Solutions Act of 2006, establishes first-in-the-world comprehensive program of regulatory and market mechanisms to achieve real, quantifiable, cost-effective reductions of GHGs (GHG). AB-32 makes the Air Resources Board (ARB) responsible for monitoring and reducing GHG emissions.

**AB 118**

California Assembly Bill 118 created the Energy Commission's Alternative and Renewable Fuel and Vehicle Technology Program. The program is intended to increase the use of alternative and renewable fuels and innovative technologies that will transform California's fuel and vehicle types to help attain the state's climate change policies.

**SB 375**

On September 30, 2008 California Governor Arnold Schwarzenegger signed SB 375, making it the first law in the nation to link land use planning with global warming. SB 375 provides a plan for reducing greenhouse gas emissions through strategic land use and development. SB 375 directs CARB to set regional caps for automobile and light truck emissions that would help the state achieve its greenhouse emissions cap of 1990 levels by 2020 originally set in AB 32. The bill also sets forth a Sustainable Communities Strategy, which directs metropolitan planning organizations, in conjunction with CARB, to examine land-use patterns and to create long-term housing and transportation plans that can be used to achieve the regional caps.

The bill also provides incentives for initiatives under the Sustainable Communities Strategy. Projects in high density areas with easy access to public transportation will be exempt from certain administrative requirements under the California Environmental Quality Act and will get priority transportation funding. Similarly, traffic mitigation initiatives will not be required to file certain traffic impact reports. Streamlining these processes is expected to encourage adherence to the Sustainable Communities Strategy.

**AB 939**

In 1989 California enacted Assembly Bill 939 in an effort to begin diverting recyclable waste materials from the ever growing landfills, which were fast becoming a national crisis. AB 939 required cities and counties and other municipalities to divert 50 percent of their waste from landfills by the year 2000.

## APPENDIX C – PROPOSITION A

## LEGAL TEXT OF PROPOSITION A

## PROPOSITION A

Describing and setting forth a proposal to the qualified voters of the City and County of San Francisco to amend the Charter of the City and County of San Francisco by: amending Sections 8A.100 through 8A.106, 8A.108 through 8A.110, 8A.112 through 8A.113, and A8.404; repealing Section 16.110; re-numbering Sections 16.100 and 16.102 as 8A.114 and 8A.115, respectively and amending Section 8A.115; and requiring the Board of Supervisors to adopt an ordinance amending the Traffic Code to repeal any provision in conflict with this measure and convert such provisions to rules and regulations of the Municipal Transportation Agency Board of Directors, all to increase the efficiency, effectiveness and autonomy of the Municipal Transportation Agency and to reduce greenhouse gas emissions from San Francisco's transportation sector.

The Board of Supervisors hereby submits to the qualified voters of the City and County, at an election to be held on November 6, 2007, a proposal to amend the Charter of the City and County by: amending Sections 8A.100 through 8A.106, 8A.108 through 8A.110, 8A.112 through 8A.113, and A8.404; repealing Section 16.110; re-numbering Sections 16.100 and 16.102 as 8A.114 and 8A.115 and amending Section 8A.115; and requiring the Board of Supervisors to adopt an ordinance amending the Traffic Code to repeal any provision in conflict with this measure and convert such provisions to rules and regulations of the Municipal Transportation Agency Board of Directors, to read as follows:

Note: Additions are single underline italics Times New Roman.  
Deletions are ~~strikethrough italics Times New Roman~~.

Section 1. The San Francisco Charter is hereby amended by amending Sections 8A.100 through 8A.106, 8A.108 through 8A.110, and 8A.112 through 8A.113, to read as follows:  
**SEC. 8A.100. PREAMBLE.**

(a) An effective, efficient, and safe transportation system is vital for San Francisco to achieve its goals for quality of life, environmental sustainability, public health, social justice, and economic growth. The Municipal Transportation Agency must manage San Francisco's transportation system – which includes automobile, freight, transit, bicycle, and pedestrian networks – to help the City meet those goals. Through this measure, the voters seek to provide the Municipal Transportation Agency with improved resources and expanded independence and authority in order to create a transportation system that is among the best in the world. The Municipal Railway and the Department of Parking and Traffic are vital to the economic and social fabric of San Francisco. San Francisco's transit system should be comparable to the best urban transit systems in the world's major cities.

(b) This article requires the Municipal Transportation Agency to develop clear, meaningful and quantifiable measures of its performance and goals and to regularly publicize those standards. This article also recognizes that the workers of the Municipal Transportation Agency are vital to the success of the Agency and to achieving the improvements voters seek. Therefore, it authorizes incentives for excellence and requires accountability for both managers and employees.

(c) Specifically, San Francisco residents require:

1. Reliable, safe, timely, frequent, and convenient transit service to all neighborhoods;
2. A reduction in breakdowns, delays, over-crowding, preventable accidents;
3. Clean and comfortable transit vehicles and stations, operated by competent, courteous, and well trained employees;
4. Support and accommodation of the special transportation needs of the elderly and the disabled;
5. Protection from crime and inappropriate passenger behavior on the Municipal Railway; and
6. Responsive, efficient, and accountable management;
7. Roads that are not gridlocked with congestion;

8. A safe and comprehensive network of bicycle lanes;
9. A safe and inviting environment for pedestrians;
10. Efficient movement of goods and deliveries;
11. A transportation sector that promotes environmental sustainability and does not contribute to global warming; and
12. A well-managed and well-coordinated transportation system that contributes to a livable urban environment.

Through this measure, the voters seek to provide the transportation system with the resources, independence and focus necessary to achieve these goals.

(d) The voters find that one of the impediments to achieving these goals in the past has been that responsibility for transportation has been diffused throughout City government. Accordingly, this Article places within the Municipal Transportation Agency the powers and duties relating to transit now vested in other departments, boards, and commissions of the City and County. This Article further requires that, to the extent other City and County agencies provide services to the Municipal Transportation Agency, those departments must give the highest priority to the delivery of such services.

(e) At the same time, this Article is intended to ensure sufficient oversight of the Municipal Transportation Agency by, among other things, preserving the role of the City's Controller as to financial matters, the City Attorney as to legal matters, and the Civil Service Commission, as to merit system issues. In addition, this Article requires that outside audits be performed to ensure that required service levels are obtained with a minimum of waste.

This Article also requires that the Municipal Transportation Agency develop clear, measured performance goals, and publicize both its goals and its performance under those goals. As the workers of the Municipal Transportation Agency are vital to the improvements the voters seek, this Article authorizes incentives for excellence, and requires accountability for both managers and employees when performance falls short.

(f) Finally, this Article is intended to strengthen the Municipal Transportation Agency's authority to: 1) manage its employees; 2) establish efficient and economical work rules and work practices that maximize the Agency's responsiveness to public needs; and 3) protect the Agency's Railway's right to select, train, promote, demote, discipline, lay-off and terminate employees, managers, and supervisors based upon the highest standards of customer service, efficiency and competency.

(g) ~~(b)~~ The effective management of traffic flow and parking are The Department of Parking and Traffic performs functions vital to the operation of the Municipal Railway. Congestion on city streets causes delays in transit operations. Therefore, the Municipal Transportation Agency must manage parking and traffic flow to ensure that transit vehicles move through City streets safely and efficiently.

(h) In addition, the residents of San Francisco require that the Agency Department of Parking and Traffic: 1) value and protect the safety of pedestrians and bicyclists; 2) reduce congestion and air pollution through efficient use of the streets; and 3) protect the City's economic health by giving priority to commercial deliveries and access to local businesses.

(i) ~~(c)~~ The voters find that reducing the carbon emissions from San Francisco's transit sector is fundamental to the City's health and wellbeing and shall be among the Agency's policy priorities. Because the Agency has significant influence on San Francisco's transportation sector, which is responsible for fully half of the carbon emissions produced within the City, the voters direct the Agency to develop and implement strategies for substantially reducing those emissions. The voters further affirm the goals of the City's Climate Action Plan.

(j) ~~(d)~~ This Article shall be interpreted and applied in conformance with the above goals.

## SEC. 8A.101. MUNICIPAL TRANSPORTATION AGENCY.

(a) There shall be a Municipal Transportation Agency. The Agency shall include a Board of Directors and a Director of Transportation. The Agency shall include the Municipal Railway and the





## LEGAL TEXT OF PROPOSITION A

former Department of Parking and Traffic, as well as any other departments, bureaus or operating divisions hereafter created or placed under the Agency. There shall also be a Citizens Advisory Committee to assist the Agency.

~~(b) Effective March 1, 2000, the Agency shall succeed to and assume all powers and responsibilities of the Public Transportation Commission.~~

~~(c) Effective July 1, 2000, the Municipal Railway shall become a department of the Agency and the full provisions of this Article shall be applicable.~~

~~(d) The Department of Parking and Traffic, upon its incorporation into the Agency pursuant to Section 8A.112, become a separate department of the Agency.~~

~~(b) (4) The Board of Supervisors shall have the power, by ordinance, to abolish the Taxi Commission created in Section 4.133, and to transfer the powers and duties of that commission to the Agency under the direction of the Director of Transportation or his or her designee the Board of Directors. In order to fully integrate taxi-related functions into the Agency should such a transfer occur, the Agency shall have the same exclusive authority over taxi-related functions and taxi-related fares, fees, charges, budgets, and personnel that it has over the Municipal Railway and parking and traffic fares, fees, charges, budgets, and personnel. Once adopted, Agency regulations shall thereafter supercede all previously adopted ordinances governing motor vehicles for hire that conflict with or duplicate such regulations.~~

~~(c) (4) Any transfer of functions occurring as a result of the above provisions shall not adversely affect the status, position, compensation, or pension or retirement rights and privileges of any civil service employees who engaged in the performance of a function or duty transferred to another office, agency, or department pursuant to this measure.~~

~~(d) (4) Except as expressly provided in this Article, the Agency shall comply with all of the restrictions and requirements imposed by the ordinances of general application of the City and County, including ordinances prohibiting discrimination of any kind in employment and contracting, such as Administrative Code Chapters 12B et seq., as amended from time to time. The Agency shall be solely responsible for the administration and enforcement of such requirements.~~

~~(e) (4) The Agency may contract with existing City and County departments to carry out any of its powers and duties. Any such contract shall establish performance standards for the department providing the services to the Agency, including measurable standards for the quality, timeliness, and cost of the services provided. All City and County departments must give the highest priority to the delivery of such services to the Agency.~~

~~(f) (4) The Agency may not exercise any powers and duties of the Controller or the City Attorney and shall contract with the Controller and the City Attorney for the exercise of such powers and duties.~~

## SEC. 8A.102. GOVERNANCE AND DUTIES.

(a) The Agency shall be governed by a board of seven directors appointed by the Mayor and confirmed after public hearing by the Board of Supervisors. All initial appointments must be made by the Mayor and submitted to the Board of Supervisors for confirmation no later than February 1, 2000. The Board of Supervisors shall act on those initial appointments no later than March 1, 2000 or those appointments shall be deemed confirmed.

At least four of the directors must be regular riders of the Municipal Railway, and must continue to be regular riders during their terms. The directors must possess significant knowledge of, or professional experience in, one or more of the fields of government, finance, or labor relations. At least two of the directors must possess significant knowledge of, or professional experience in, the field of public transportation. During their terms, all directors shall be required to ride the Municipal Railway on the average once a week.

Directors shall serve four-year terms, provided, however, that two of the initial appointees shall serve for terms ending March 1, 2004, two for terms ending March 1, 2003, two for terms ending March 1, 2002,

and one for a term ending March 1, 2001. Initial terms shall be designated by the Mayor. No person may serve more than three terms as a director. A director may be removed only for cause pursuant to Article XV. The directors shall annually elect a chair. The chair shall serve as chair at the pleasure of the directors. Directors shall receive reasonable compensation for attending meetings of the Agency which shall not exceed the average of the two highest compensations paid to the members of any board or commission with authority over a transit system in the nine Bay Area counties.

(b) The Agency shall:

1. Have exclusive authority over charge of the acquisition, construction, management, supervision, maintenance, extension, operation, use, and control of all property, as well as the real, personal, and financial assets of the Agency Municipal Railway; and have exclusive authority over contracting, leasing, and purchasing by the Agency Municipal Railway, provided that any Agency contract for outside services shall be subject to Charter Sections 10.104(12) and 10.104(15), and that the Agency may not transfer ownership. Ownership of any of the real property of the City and County without approval from the Board of Directors and the Board of Supervisors shall not be transferred to any private entity pursuant to any such contract;

2. Have the sole power and exclusive authority to enter into such arrangements and agreements for the joint, coordinated, or common use with any other public entity owning or having jurisdiction over rights-of-way, tracks, structures, subways, tunnels, stations, terminals, depots, maintenance facilities, and transit electrical power facilities;

3. Have the sole power and exclusive authority to make such arrangements as it deems proper to provide for the exchange of transfer privileges, and through-ticketing arrangements, and such arrangements shall not constitute a fare change subject to the requirements of Sections 8A.106 and 8A.108;

4. Notwithstanding any restrictions on contracting authority set forth in the Administrative Code, have exclusive authority to enter into agreements for the distribution of transit fare media and media for the use of parking meters or other individual parking services;

5. Have the exclusive authority to arrange with other transit agencies for bulk fare purchases, provided that if passenger fares increase as a result of such purchases, the increase shall be subject to review by the Board of Supervisors pursuant to Sections 8A.106 and 8A.108;

6. Notwithstanding Section 2.109, and except as provided in Sections 8A.106 and 8A.108, have exclusive authority to fix the fares charged by the Municipal Railway, rates for off-street and on-street parking, and all other rates, fees, fines, penalties and charges for services provided or functions performed by the Agency;

7. Notwithstanding any provision of the San Francisco Municipal Code (except requirements administered by the Department of Public Works governing excavation, street design and official grade) have exclusive authority to adopt regulations that control the flow and direction of motor vehicle, bicycle and pedestrian traffic, including regulations that limit the use of certain streets or traffic lanes to categories of vehicles and that limit the speed of traffic; and to design, select, locate, install, operate, maintain and remove all official traffic control devices, signs, roadway features and pavement markings that control the flow of traffic with respect to streets and highways within City jurisdiction, provided that:

(i) Notwithstanding the authority established in subsection 7, the Board of Supervisors may by ordinance establish procedures by which the public may seek Board of Supervisors review of any Agency decision with regard to the installation or removal of a stop sign or the creation or elimination of a bicycle lane. In any such review, the Agency's decision shall stand unless the Board of Supervisors reverses the decision of the Agency not later than 60 days after submission of a request to the Board of Supervisors.

(ii) Nothing in this subsection 7 shall modify the authority of ISCOIT, or any successor body, over the temporary use or occupancy of public streets, or the authority of the Board of Supervisors to hear appeals regarding the temporary use or occupancy of public streets.





## LEGAL TEXT OF PROPOSITION A

(iii) *Nothing in subsection 7 shall modify the power of the Board of Supervisors to establish civil offenses, infractions and misdemeanors.*

(iv) *Notwithstanding the authority established in subsection 7, to the extent state law contemplates that Agency action authorized by subsection 7 be effectuated by ordinance, such action shall be effectuated by resolution of the Board of Directors and shall be subject to referendum in accordance with Article 14, and, if a referendum petition contains the requisite number of signatures, the Board of Supervisors shall have the power to reconsider or repeal the action as provided in Article 14.*

8. *Have exclusive authority to adopt regulations limiting parking, stopping, standing or loading as provided by state law and to establish parking privileges and locations subject to such privileges for categories of people or vehicles as provided by state law; to establish parking meter zones, to set parking rates, and to select, install, locate and maintain systems and equipment for payment of parking fees, provided that:*

(i) *Notwithstanding the authority established in subsection 8, the Board of Supervisors may by ordinance establish procedures by which the public may seek Board of Supervisors review of any Agency decision with regard to the creation or elimination of any preferential parking zone, the creation or elimination of any parking meter zone, the adoption of any limitation on the time period for which a vehicle may be parked, or reservation of any parking space for persons with a disability that qualifies for parking privileges under state law. In any review of a decision of the Agency pursuant to this section, the Agency's decision shall stand unless the Board of Supervisors reverses the decision of the Agency not later than 60 days after submission of a request to the Board of Supervisors.*

(ii) *Nothing in subsection 8 shall modify the power of the Board of Supervisors to establish civil offenses, infractions and misdemeanors.*

(iii) *Notwithstanding the authority established in subsection 8, to the extent state law contemplates that any Agency action authorized by subsection 8 be effectuated by ordinance, such action shall be effectuated by resolution of the Board of Directors and, if a referendum petition contains the requisite number of signatures, shall be subject to referendum in accordance with Article 14, and the Board of Supervisors shall have the power to reconsider or repeal the action as provided in Article 14.*

9. *Have exclusive authority to establish policies regarding and procure goods and services for the enforcement of regulations limiting parking, stopping, standing or loading and the collection of parking-related revenues and, along with the Police Department, have authority to enforce parking, stopping, standing or loading regulations;*

10. *Be responsible for chairing the Interdepartmental Staff Committee on Traffic and Transportation (ISCOTT) or any successor body;*

11. *Be responsible for cooperating with and assisting the Police Department in the promotion of traffic safety; studying and responding to complaints related to street design, traffic control devices, roadway features and pavement markings; collecting, compiling and analyzing traffic data and traffic accident data and planning improvements to improve the safety of the City's roadways; and conducting traffic research and planning;*

12. *Have exclusive authority to apply for, accept, and expend state, federal, or other public or private grant funds for Agency purposes;*

13. *To the maximum extent permitted by law, with the concurrence of the Board of Supervisors, and notwithstanding the requirements and limitations of Sections 9.107, 9.108, and 9.109, have authority without further voter approval to incur debt for Agency purposes and to issue or cause to be issued bonds, notes, certificates of indebtedness, commercial paper, financing leases, certificates of participation or any other debt instruments. Upon recommendation from the Board of Directors, the Board of Supervisors may authorize the Agency to incur on behalf of the City such debt or other obligations provided: 1) the Controller first certifies that sufficient unencumbered balances are expected to be avail-*

*able in the proper fund to meet all payments under such obligations as they become due; and 2) any debt obligation, if secured, is secured by revenues or assets under the jurisdiction of the Agency.*

14. *6. Have the authority to conduct investigations into any matter within its jurisdiction through the power of inquiry, including the power to hold public hearings and take testimony, and to take such action as may be necessary to act upon its findings; and*

15. *7. Exercise such other powers and duties as shall be prescribed by ordinance of the Board of Supervisors.*

(c) *The Agency's board Board of directors Directors shall:*

1. *Appoint a director Director of transportation Transportation, who shall serve at the pleasure of the Board. The Director of Transportation shall be employed pursuant to an individual contract. His or her compensation shall be comparable to the compensation of the chief executive officers of the public transportation systems in the United States which the Board of Directors, after an independent survey, determine most closely resemble the Agency in size, mission, and complexity. In addition, the Agency Board of Directors shall provide an incentive compensation plan consistent with the requirements of Section 8A.104(k) under which a portion of the Director's compensation is based on achievement of service standards adopted by the Board of Directors, bonus plan for the director of transportation based upon the Agency's achievement of the milestones adopted pursuant to Section 8A.103.*

2. *Appoint an executive secretary who shall be responsible for administering the affairs of the Board of Directors and who shall serve at the pleasure of the Board.*

3. *In addition to any training that may be required by City, State or federal law, attend a minimum of four hours of training in each calendar year, provided by the City Attorney and the Controller regarding the legal and financial responsibilities of the Board and the Agency.*

(d) *The Director of Transportation shall appoint all subordinate personnel of the Agency, including deputy directors, a deputy director for the Municipal Railway, and, upon its incorporation into the Agency, a deputy director for Parking and Traffic. The deputy directors shall serve at the pleasure of the Director of Transportation. The director of transportation may serve as the deputy director for the Municipal Railway, but shall not be entitled to any greater compensation or benefits on that basis.*

(e) *Upon recommendation of the City Attorney and the approval of the Board of Directors, the City Attorney may compromise, settle, or dismiss any litigation, legal proceedings, claims, demands or grievances which may be pending for or on behalf of, or against the Agency relative to any matter or property solely under the Agency's jurisdiction. Unlitigated claims or demands against the Agency shall be handled as set forth in Charter Section 6.102. Any payment pursuant to the compromise, settlement, or dismissal of such litigation, legal proceedings, claims, demands, or grievances, unless otherwise specified by the Board of Supervisors, shall be made from the Municipal Transportation Fund.*

(f) *The Agency's Board of Directors, and its individual members, shall deal with administrative matters solely through the Director of Transportation or his or her designees. Any dictation, suggestion, or interference by a director in the administrative affairs of the Agency, other than through the Director of Transportation or his or her designees, shall constitute official misconduct; provided, however, that nothing herein contained shall restrict the Board of Directors' powers of hearing and inquiry as provided in this Section.*

(g) *Notwithstanding any provision of Chapter 6 or 21 of the Administrative Code establishing any threshold amount for exercise of executive authority to execute contracts, or any successor provision of the San Francisco Municipal Code, the Agency's Board of Directors may adopt threshold amounts under which the Director of Transportation and his or her designees may approve contracts.*

(h) ~~6.4~~ Except provided in this Article, the Agency shall be subject to the provisions of this Charter applicable to boards, commissions, and departments of the City and County, including Sections 2.114, 3.105, 4.101, 4.103, 4.104, 4.113, 6.102, 9.118, 16.100, and A8.346. Sections 4.102, 4.126, and 4.132 shall not be applicable to the Agency.





## LEGAL TEXT OF PROPOSITION A

## SEC. 8A.103. SERVICE STANDARDS AND ACCOUNTABILITY.

(a) The Municipal Railway shall ~~be restored as soon as practicable to provide~~ a level of service measured in service hours which is not less than that provided under the schedule of service published in the April 1996 timetable, although not necessarily in that configuration.

(b) ~~No later than July 1, 2000, and by July 1 of each year thereafter,~~ the Agency shall adopt milestones ~~for the~~ toward achievement of the goals specified in subsections (c) and (d). Milestones shall be adopted for each mode of transportation of the Municipal Railway, and for the Municipal Railway as a whole, with the goal of full achievement of the standards set in subsection (c) ~~no later than July 1, 2004~~.

(c) The standards for the Agency with respect to the services provided by the Municipal Railway shall include the following minimum standards for on-time performance and service delivery:

1. On-time performance: at least 85 percent of vehicles must run on-time, where a vehicle is considered on-time if it is no more than one minute early or four minutes late as measured against a published schedule that includes time points; and

2. Service delivery: 98.5 percent of scheduled service hours must be delivered, and at least 98.5 percent of scheduled vehicles must begin service at the scheduled time.

(d) ~~The standards for both managers and employees of the Agency with respect to the services provided by the Municipal Railway shall also include other~~ The Board of Directors shall adopt Agency rules setting additional measurable standards for system reliability, system performance, staffing performance, and customer service, including:

1. Passenger, public, and employee safety and security;
2. Coverage of neighborhoods and equitable distribution of service;
3. Level of crowding;
4. Frequency and mitigation of accidents and breakdowns;
5. Improvements in travel time, taking into account adequate recovery and lay-over times for operators;
6. Vehicle cleanliness, including absence of graffiti;
7. Quality and responsiveness of customer service;
8. Employee satisfaction;
9. Effectiveness of the preventive maintenance program; and
10. Frequency and accuracy of communications to the public.

11. ~~The Agency's duties related to parking and traffic functions and any other functions that may be added to the Agency's responsibilities.~~

(e) ~~The Board of Directors shall adopt Agency rules setting forth the methods by which performance shall be measured with respect to each standard established pursuant to subsections (c) or (d) above in accordance with industry best practices to enhance the Agency's ability to compare its performance to that of other comparable transit systems. The performance measures adopted in Section 4 of this measure shall be published as rules of the Agency and utilized to determine the achievement of the performance standards and milestones adopted by the Agency for the Municipal Railway. The performance measures shall be subject to amendment after public hearing by a vote of the Agency board. The Agency shall regularly publish reports documenting the Agency's performance for each standard. Each performance report shall note any changes in the rules governing the methods by which performance is measured so as to inform interpretation of performance trends over time, on its attainment of those standards and milestones. Nothing herein shall prohibit the Agency from using additional performance measures.~~

(f) ~~The Agency shall issue a Climate Action Plan to the Board of Supervisors and the Commission on the Environment by January 1, 2009, and every two years thereafter. The plan shall describe measures taken and progress made toward the goal of reducing greenhouse gas emissions from San Francisco's transportation sector to 80% of 1990 levels by 2012 and shall further address progress toward the following goals:~~

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.~~

~~No later than January 1, 2010, and no less than every ten years thereafter, the Board of Supervisors shall adopt legislation setting goals for reducing greenhouse gas emissions from San Francisco's transportation sector, and other climate action measures set forth above, for periods after 2012.~~

## SEC. 8A.104. PERSONNEL AND MERIT SYSTEM.

(a) The Agency shall establish its own personnel/labor relations office. The ~~d~~Director of ~~t~~ransportation shall appoint a personnel/labor relations manager, who shall serve at the pleasure of the ~~d~~Director of ~~t~~ransportation and shall establish regular meetings with labor to discuss issues within the scope of representation on terms to be determined through collective bargaining.

(b) Except as otherwise provided in this Section, the Agency shall be governed by the rules of the civil service system administered by the City and appeals provided in civil service rules shall be heard by the City's Civil Service Commission. Unless otherwise agreed by the Agency and affected employee organizations, appeals to the Civil Service Commission shall include only those matters within the jurisdiction of the Civil Service Commission which establish, implement, and regulate the civil service merit system as listed in Section A8.409-3.

(c) Effective July 1, 2000, except for the administration of health services, the Agency shall assume all powers and duties vested in the Department of Human Resources and the Director of Human Resources under Articles X and XI of this Charter in connection with job classifications within the ~~Municipal Railway Agency~~ performing "service-critical" functions. Except for the matters set forth in subsection (f), the Department of Human Resources and the Director of Human Resources shall maintain all powers and duties under Articles X and XI as to all other Agency employees.

(d) On or before April 15, 2000, the Agency shall designate "service-critical" classifications and functions for all existing classifications used by the Municipal Railway; provided, however, that employees in classifications designated as "service-critical" shall continue to be covered by any Citywide collective bargaining agreement covering their classifications until the expiration of that agreement.

(e) For purposes of this Article, "service-critical" functions are:

1. Operating a transit vehicle, whether or not in revenue service;
2. Controlling dispatch of, or movement of, or access to, a transit vehicle;

3. Maintaining a transit vehicle or equipment used in transit service, including both preventive maintenance and overhaul of equipment and systems, including system-related infrastructure;

4. Regularly providing information services to the public or handling complaints; and

5. Supervising or managing employees performing functions enumerated above.

The Agency shall consult with affected employee organizations before designating particular job classifications as performing "service-critical" functions. If an employee organization disagrees with the Agency's designation of a particular job classification as "service-critical" pursuant to the above standards, the organization may, within seven days of the Agency's decision, request immediate arbitration. The arbitrator shall be chosen pursuant to the procedures for the selection of arbitrators contained in the memorandum of understanding of the affected employee organization. The arbitrator shall determine only whether the Agency's designation is reasonable based on the above standards. The arbitrator's decision shall be final and binding.

The Agency may designate functions other than those listed above, and the job classifications performing those additional functions, as "service-critical," subject to the consultation and arbitration provisions of this Section. In deciding a dispute over such a designation, the arbitrator shall decide whether the job functions of the designated classes





## LEGAL TEXT OF PROPOSITION A

relate directly to achievement of the goals and milestones adopted pursuant to Section 8A.103 and are comparable to the above categories in the extent to which they are critical to service.

(f) In addition, the Agency shall, with respect to all Agency employees, succeed to the powers and duties of the Director of Human Resources under Article X to review and resolve allegations of discrimination, as defined in Article XVII, against employees or job applicants, or allegations of nepotism or other prohibited forms of favoritism; ~~provided, however, that the Agency's resolution of allegations of discrimination must be approved by the City's Director of Human Resources.~~ To the extent resolution of a discrimination complaint or request for accommodation involves matters or employees beyond the Agency's jurisdiction, the Agency shall coordinate with and be subject to applicable determinations of the Director of Human Resources.

(g) The Agency shall be responsible for creating and, as appropriate, modifying ~~Agency~~ Municipal Railway bargaining units for classifications designated by the Agency as "service-critical" and shall establish policies and procedures pursuant to Government Code sections 3507 and 3507.1 for creation and modification of such bargaining units. When the Agency creates or modifies a bargaining unit, employees in existing classifications placed in such bargaining unit shall continue to be represented by their current employee organizations.

(h) The Agency may create new classifications of ~~Agency~~ employees doing specialized work for the Agency. Such classifications shall be subject to the civil service provisions of the Charter unless exempted pursuant to Section 10.104, or subsection (i).

(i) The Agency may create new classifications and positions in those classifications exempt from the civil service system for managerial employees in MTA bargaining units M and EM in addition to those exempt positions provided in Section 10.104; provided, however, that the total number of such exempt ~~new~~ managerial positions within the Agency shall not exceed ~~not~~ 2.75 percent of the Agency's total workforce, exclusive of the exempt positions provided in Section 10.104. This provision shall not be utilized to eliminate personnel holding existing permanent civil service managerial positions on November 2, 1999.

Persons serving in exempt managerial positions shall serve at the pleasure of the ~~Director of Transportation~~. Such exempt management employees, to the extent they request placement in a bargaining unit, shall not be placed in the same bargaining units as non-exempt employees of the Agency.

(j) The Civil Service Commission shall annually review both exempt and non-exempt classifications of the Agency to ensure compliance with the provisions of subsections (h) and (i).

(k) Upon the expiration of ~~current~~ labor contracts negotiated by the Department of Human Resources and approved by the Board of Supervisors, and except for retirement benefits, the wages, hours, working conditions, and benefits of the employees in classifications within the Municipal Railway designated by the Agency as "service-critical" shall be fixed by the Agency after meeting and conferring as required by the laws of the State of California and this Charter, including Sections A8.346, A8.404 and A8.409. These agreements shall utilize, and shall not alter or interfere with, the health plans established by the City's Health Service Board; provided, however, that the Agency may contribute toward defraying the cost of employees' health premiums. For any job classification that exists both as a "service-critical" classification in the ~~Agency~~ Municipal Railway and elsewhere in City service, the base wage rate negotiated by the Agency for that classification shall not be less than the wage rate set in the Citywide memorandum of understanding for that classification.

(l) Notwithstanding subsection (k), the Agency may, in its sole discretion, utilize the City's collective bargaining agreements with any employee organization representing less than 10 percent of the ~~Agency's~~ Municipal Railway's workforce.

(m) Notwithstanding any limitations on compensation contained in Section A8.404, and in addition to the base pay established in collective bargaining agreements, all agreements negotiated by the Agency relating to compensation for ~~Agency~~ Municipal Railway managers and

employees in classifications designated by the Agency as "service-critical" shall provide incentive bonuses based upon the achievement of the service standards in Section 8A.103(c) and other standards and milestones adopted pursuant to Section 8A.103. Such agreements may provide for additional incentives based on other standards established by the ~~Board of Directors Agency~~, including incentives to improve attendance. The ~~Board of Directors Agency~~ shall also establish a program under which a component of the compensation paid to the Director of Transportation and all exempt managers shall be based upon the achievement of service standard adopted by the Board of Directors. ~~that provides incentive bonuses for all managers, including all managers exempt from the civil service system, based on the achievement of these standards and milestones.~~

(n) For employees whose wages, hours and terms and conditions of employment are set by the Agency pursuant to Sections A8.404 or A8.409 et seq., the Agency shall exercise all powers of the City and County, the Board of Supervisors, the Mayor, and the Director of Human Resources under those sections. For employees covered by Section A8.409 et seq., the mediation/arbitration board set forth in Section A8.409-4 shall consider the following additional factors when making a determination in any impasse proceeding involving the Agency: the interests and welfare of transit riders, residents, and other members of the public; and the Agency's ability to meet the costs of the decision of the arbitration board without materially reducing service. Notwithstanding the timelines described in Section A8.409-4, to be effective the beginning of the next succeeding fiscal year, all collective bargaining agreements must be submitted to the Board of Directors no later than June 15 for final adoption on or before June 30. For employees whose wages, hours and terms and conditions of employment are set by the Agency pursuant to Sections A8.404, the ~~The~~ Agency shall perform the functions of the Civil Service Commission with respect to certification of the average of the two highest wage schedules for transit operators in comparable jurisdictions pursuant to Section A8.404(a), and conduct any actuarial study necessary to implement Section A8.404(f).

(o) The voters find that unscheduled employee absences adversely affect customer service. Accordingly, not later than January 1, 2001, the agency shall create a comprehensive plan for the reduction of unscheduled absences. In addition, the Agency shall take all legally permitted steps to eliminate unexcused absences. The Agency shall have no authority to approve any memorandum of understanding or other binding agreement which restricts the authority of the Agency to administer appropriate discipline for unexcused absences.

(p) Before adopting any ~~tentative collective bargaining agreement reached as a result of negotiations, mediation or arbitration~~, the Agency shall, no later than June 15, at a duly noticed public meeting, disclose in writing the contents of such ~~tentative collective bargaining agreement~~, a detailed analysis of the proposed agreement, a comparison of the differences between the agreement reached and the prior agreement, and an analysis of all costs for each year of the term of such agreement. Such ~~tentative~~ agreement between the Agency and employee organization shall not be approved by the Agency until ~~at least~~ 15 days after the above disclosures have been made.

#### SEC. 8A.105. MUNICIPAL TRANSPORTATION FUND; ~~REV. ENUES FOR PUBLIC TRANSIT.~~

(a) There is hereby established a fund to provide a predictable, stable, and adequate level of funding for the Agency, which shall be called the Municipal Transportation Fund. The fund shall be maintained separate and apart from all other City and County funds. Monies therein shall be appropriated, expended, or used by the Agency solely and exclusively for the operation including, without limitation, capital improvements, management, supervision, maintenance, extension, and day-to-day operation of ~~1) the Agency, including any divisions 2) the Municipal Railway 3) upon its incorporation into the Agency, the Department of Parking and Traffic and 4) any other division of the Agency subsequently created or incorporated into the Agency and performing transportation-related functions.~~ Monies in the Fund may not be





## LEGAL TEXT OF PROPOSITION A

used for any other purposes than those identified in this Section.

(b) Beginning with the fiscal year 2000-2001 and in each fiscal year thereafter, there is hereby set aside to the Municipal Transportation Fund the following:

1. An amount (the "Base Amount") which shall be no less than the amount of all appropriations from the General Fund, including all supplemental appropriations, for the fiscal year 1998-1999 or the fiscal year 1999-2000, whichever is higher (the "Base Year"), adjusted as provided in subsection (c), below, for (1) the Municipal Railway; and (2) all other City and County commissions, departments and agencies providing services to the Municipal Railway, including the Department of Human Resources and the Purchasing Department, for the provision of those services. The Base Amount for the Department of Parking and Traffic and the Parking Authority shall be established in the same fashion but using fiscal years 2000-2001 and 2001-2002 for the services being incorporated into the Agency.

2. Subject to the limitations and exclusions in Sections 4.113 and 4.114, the revenues of the Municipal Railway, and, upon their incorporation into the Agency, the revenues of the Department of Parking and Traffic, and the Parking Authority; and

3. All other funds received by the City and County from any source, including state and federal sources, for the support of the ~~Municipal Railway~~.

(c) The Base Amount shall initially be determined by the Controller. Adjustments to the Base Amount shall be made as follows:

1. The Base Amount shall be adjusted for each year after fiscal year 2000-2001 by the Controller based on calculations consistent from year to year, by the percentage increase or decrease in aggregate City and County discretionary revenues. In determining aggregate City and County discretionary revenues, the Controller shall only include revenues received by the City which are unrestricted and may be used at the option of the Mayor and the Board of Supervisors for any lawful City purpose. Errors in the Controller's estimate of discretionary revenues for a fiscal year shall be corrected by adjustment in the next year's estimate.

2. An adjustment shall also be made for any increases in General Fund appropriations to the Agency in subsequent years to provide continuing services not provided in the Base Year, but excluding additional appropriations for one-time expenditures such as capital expenditures or litigation judgments and settlements.

3. ~~Further, when new parking revenues increase due to policy changes in fines, taxes or newly created positions, the Base Amount shall be reduced by 50 percent of such increase to reduce the Agency's reliance on the General Fund.~~

(d) The Treasurer shall set aside and maintain the amounts required to be set aside by this Section, together with any interest earned thereon, in the Municipal Transportation Fund, and any amounts unspent or uncommitted at the end of any fiscal year shall be carried forward, together with interest thereon, to the next fiscal year for the purposes specified in this Article.

~~(e) It is the policy of the City and County of San Francisco to use parking-related revenues to support public transit. To that end, the following parking-related revenues deposited in the Transportation Fund shall be used to support the capital and operating expenses arising from the Agency's transit functions:~~

~~1. Revenues from parking meters, except those amounts collected from parking meters operated by the Recreation and Park Department and the Port Commission and except to the extent that they are required by law to be dedicated to other traffic regulation and control functions;~~

~~2. Revenues from off-street parking facilities under the jurisdiction of the Agency (excluding facilities owned by the Parking Authority), including facilities leased to private owners and non-profit corporations, except those amounts generated from any parking on or below any land or facilities under the jurisdiction of the Recreation and Park Department and except those amounts obligated by contract executed before 1993 to pay debt service;~~

~~3. Revenues from fines, forfeited bail, or penalties for parking violations, except those amounts to be credited to the courthouse con-~~

~~struction fund as provided in Administrative Code Section 10.117-35.~~

~~(f) In addition, there is hereby set aside from the general revenues of the City and County and deposited in the Transportation Fund to support the Agency's transit services an amount equivalent to 80 percent of the revenues received from the City's tax on occupation of parking spaces. Additional amounts appropriated as a result of this subsection after July 1, 2008 which were not previously available to support transit service shall be used exclusively to:~~

~~1. support implementation of the transit service improvements recommended by the Transit Effectiveness Project or any subsequent system-wide route and service evaluation, with first priority given to the hiring of full time on-going staff and expansion of training for Agency employees, supervisors and managers; and~~

~~2. support the creation of a Labor-Management Implementation and Service Improvement Committee consisting of the Director of Transportation and a designated representative of each union representing Agency employees. This committee shall meet quarterly to discuss implementation of this Section and ongoing system challenges.~~

## SEC. 8A.106. BUDGET.

The Agency shall be subject to the provisions of Article IX of this Charter except:

(a) No later than ~~May~~ ~~March~~ 1 of each ~~even-numbered~~ year, after professional review, public hearing and after receiving the recommendations of the Citizens' Advisory Council, the Agency shall submit its proposed budget with annual appropriation detail in a form approved by the Controller for each of the next two fiscal years year to the Mayor and the Board of Supervisors for their review and consideration. The Agency shall propose a ~~base~~ budget that is balanced without the need for additional funds over the Base Amount, but may include fare increases and decreases, and reductions or abandonment of service. The Mayor shall submit the ~~base~~ budget to the Board of Supervisors, without change. Should the Agency request additional ~~general fund~~ support over the Base Amount, it shall submit an augmentation request for those funds in the standard budget process and subject to normal budgetary review and amendment under the general provisions of Article IX.

(b) At the time the budget is adopted, the Agency shall certify that the budget is adequate in all respects to make substantial progress towards meeting the goals, objectives, and performance standards established pursuant to Section 8A.103 for the fiscal year covered by the budget.

(c) No later than August 1, the Board of Supervisors may allow the Agency's ~~base~~ budget to take effect without any action on its part or it may reject but not modify the Agency's ~~base~~ budget by a ~~two-thirds seven-elevenths~~ vote. Any fare ~~or service~~ change, route abandonment, or revenue measure proposed in the ~~base~~ budget shall be considered accepted unless rejected by a ~~two-thirds seven-elevenths~~ vote on the entire ~~base~~ budget. Should the Board reject the ~~base~~ budget, it shall make additional interim appropriations to the Agency from the Municipal Transportation Fund sufficient to permit the Agency to maintain all operations through the extended interim period until a ~~base~~ budget is adopted. Any request for appropriation of General Fund revenues in excess of the Base Amount ~~augmentation funding~~ shall be approved, modified, or rejected under the general provisions of Article IX.

(d) No later than May 1 of each odd-numbered year, the Agency shall submit any budget amendment that may be required to increase appropriations over those approved in the two year budget or as may be required by law, provided that such budget amendment shall establish a detailed plan with appropriation detail only for those anticipated revenues and expenditures exceeding those approved in the two year budget or as otherwise required by law. The Agency may submit to the Board of Supervisors such additional budget amendments or modifications during the term of the budget, including but not limited to amendments reflecting fare changes, route abandonments and revenue measures, as may be required in the discretion of the Agency. The Board of Supervisors may allow any budget amendment to take effect without any action on its part





## LEGAL TEXT OF PROPOSITION A

*or it may reject but not modify the budget amendment by a seven-elevenths' vote taken within 30 days after its submission to the Board of Supervisors.*

*(e) Notwithstanding any other provisions of this Charter or requirements of the Annual Salary Ordinance, the Controller may authorize the Agency to move funds within its budget and hire personnel without specific Controller approval so long as the Agency's periodic and verifiable projections of spending by the Agency show the Controller that the Agency's spending will be within the approved budget. However, should the projections show that the Agency spending is likely to exceed its budget, the Controller may impose appropriate controls in his or her discretion to keep the Agency within budget.*

#### SEC. 8A.108. FARE CHANGES AND ROUTE ABANDONMENTS.

(a) *Except as otherwise provided in this Section, any proposed change in fares or route abandonments shall be submitted to the Board of Supervisors as part of the Agency's budget or as a budget amendment under Section 8A.106, and may be rejected at that time by a two-thirds seven-elevenths vote of the Board on the budget or budget amendment. Any changes in fares or route abandonments proposed by the Agency specifically to implement a program of service changes identified in a system-wide strategic route and service evaluation such as the Transit Effectiveness Project may only be rejected by a single seven-elevenths' vote of the Board of Supervisors on the budget or budget amendment.*

(b) The Agency shall base any proposed change in Municipal Railway fares on the following criteria:

1. The Municipal Railway's need for additional funds for operations and capital improvements *and optimal maintenance of assets.*
2. The extent to which the increase is necessary to meet the goals, objectives, and performance standards previously established by the Agency pursuant to Section 8A.103.
3. The extent to which the Agency has diligently sought other sources of funding for the operations and capital improvements of the Municipal Railway.
4. The need to keep Municipal Railway fares low to encourage maximum patronage.
5. The need to increase fares gradually over time to keep pace with inflation and avoid large fare increases after extended periods without a fare increase.

*(c) (b) For purposes of this Article, a "route abandonment" shall mean the permanent termination of service along a particular line or service corridor where no reasonably comparable substitute service is offered. If the Agency proposes to abandon a route at any time other than as part of the budget process as provided in Section 8A.106 8A.106(a), it shall first submit the proposal to the Board of Supervisors. The Board of Supervisors may, after a noticed public hearing, reject the proposed route abandonment by a two-thirds seven-elevenths vote of its members taken within 30 days after the proposal is submitted by the Agency.*

#### SEC. 8A.109. ADDITIONAL SOURCES OF REVENUE.

*(a) To the extent allowed by law, the Board of Supervisors may, by ordinance, dedicate to the Agency revenues from sources such as gas taxes, motor vehicle licensing taxes or other available motor vehicle-related revenue sources.*

*(b) The Mayor, the Board of Supervisors, and the Agency diligently shall seek to develop new sources of funding for the Agency's operations, including sources of funding dedicated to the support of such operations, which can be used to supplement or replace that portion of the Municipal Transportation Fund consisting of appropriations from the General Fund of the City and County. To the extent permitted by State law, Unless prohibited by preemptive state law, the Agency may submit any proposal for increased or reallocated funding to support all or a portion of the operations of the Agency, including, without limitation, a tax or special assessment directly to the electorate for approval, or to the owners of property or businesses to be specially assessed, or to any other persons or entities whose approval may be legally required, without the further approval of the Mayor or the Board of Supervisors. The Agency*

shall be authorized to conduct any necessary studies in connection with considering, developing, or proposing such revenue sources.

#### SEC. 8A.110. PLANNING AND ZONING.

The planning and zoning provisions of this Charter and the Planning Code, as they may be amended from time to time, shall apply to all real property owned or leased by the Agency but *shall not impede the Agency's exclusive authority to set rates and other charges pursuant to Section 8A.102(b)(5).*

#### SEC. 8A.112. PARKING AND TRAFFIC; INCORPORATION INTO AGENCY

*(a) By July 1, 2001, the Agency and the Department of Parking and Traffic shall prepare and submit to the Mayor and the Board of Supervisors a joint plan for incorporating the Department into the Agency.*

*(b) Effective July 1, 2002, the Department of Parking and Traffic shall become a separate department of the Municipal Transportation Agency and Charter Section 4.116, establishing the Parking and Traffic Commission, shall be repealed. Effective that date, the Agency shall have all the same powers and duties with respect to the Department of Parking and Traffic that it has with respect to the Municipal Railway, and shall succeed to all powers and duties of the Parking and Traffic Commission.*

*(a) The Municipal Transportation Agency Board of Directors shall succeed to all powers and duties of the former Parking and Traffic Commission. Effective July 1, 2002, the Agency's board of directors shall also exercise all remaining powers of the Parking and Traffic Commission for all purposes, including the power of members of the Parking and Traffic Commission to serve ex officio as members of the Parking Authority Commission under Section 32657 of the Streets and Highways Code. The chair of the Agency's board of directors shall designate annually the directors to serve as members of the Parking Authority Commission. Any person may serve concurrently as a member of the Agency's board of directors and as a member of the Parking Authority Commission. It is the policy of the City and County that the Agency exercise all powers vested by State law in the Parking Authority.*

*(b) It shall be City policy that the offices of Director of Transportation and Parking Authority Executive Director are not incompatible offices, and the Director of Transportation may serve ex officio as Parking Authority Executive Director, but shall not receive any additional compensation for that service.*

*(c) Except as provided in subsection (a), no provision of this Article shall apply to the Department of Parking and Traffic prior to July 1, 2002.*

#### SEC. 8A.113. PARKING AND TRAFFIC; GOVERNANCE.

*(a) The Agency shall be responsible for management of parking and traffic functions within the City, so as to manage the functions of the Department of Parking and Traffic so that the department:*

1. *Provide Provides* priority to transit services in the utilization of streets, particularly during commute hours while maintaining the safety of passengers, pedestrians, cyclists and motorists;
2. *Facilitate Facilitates* the design and operation of City streets to enhance alternative forms of transit, such as pedestrian, bicycle, and pooled or group transit (including taxis);
3. *Propose Proposes* and *implement implements* street and traffic changes that gives the highest priority to public safety and to impacts on public transit, pedestrians, commercial delivery vehicles, and bicycles;
4. *Integrate Integrates* modern information and traffic-calming techniques to promote safer streets and promote usage of public transit; and
5. *Develop Develops* a safe, interconnected bicycle circulation network; and
6. *Ensure that parking policies and facilities contribute to the long term financial health of the Agency.*

*(b) It shall be City policy that the The Agency shall manage the Parking Authority so that it does not acquire or construct new or expanded parking facilities unless the Agency finds that the costs resulting from*



## LEGAL TEXT OF PROPOSITION A

such acquisition, construction, or expansion and the operation of such facilities will not reduce the level of funding to the Municipal Railway from parking and garage revenues under Section 16.110 to an amount less than that provided for fiscal year 1999-2000, as adjusted by the Controller for inflation; further provided that it shall be City policy that before approving the acquisition, construction or expansion of a parking garage, the Agency's Board of Directors shall make a finding that the operation of the garage will advance or be consistent with the City's Transit First Policy.

Section 2. The San Francisco Charter is hereby amended by renumbering Sections 16.100 and 16.102 as Sections 8A.114 and 8A.115 respectively and amending Section 8A.115 to read as follows:

**SEC. 8A.114. ~~16.100~~. CABLE CARS.**

In the conduct of the public transportation system there shall be maintained and operated cable car lines as follows:

1. A line commencing at Powell and Market Streets; thence along Powell Street to Jackson Street; thence along Jackson Street to Mason Street; thence along Mason Street to Columbus Avenue; thence along Columbus Avenue to Taylor Street; thence along Taylor Street to a terminal at Bay Street; returning from Bay and Taylor Streets along Taylor Street to Columbus Avenue; thence along Columbus Avenue to Mason Street; thence along Mason Street to Washington Street; thence along Washington Street to Powell Street; and thence along Powell Street to Market Street, the point of commencement.

2. A line commencing at Powell and Market Streets; thence along Powell Street to Jackson Street; thence along Jackson Street to Hyde Street; thence along Hyde Street to a terminal at Beach; returning from Beach and Hyde Streets along Hyde Street to Washington Street; thence along Washington Street to Powell Street; thence along Powell Street to Market Street, the point of commencement.

3. A line commencing at Market and California; thence along California Street to a terminal at Van Ness Avenue; returning from Van Ness Avenue along California Street to Market Street, the point of commencement.

To fully effectuate the intent of this section, these lines shall be maintained and operated at the normal levels of scheduling and service in effect on July 1, 1971; provided, however, that nothing herein contained shall prevent the increasing of the levels of scheduling and service.

**SEC. 8A.115. ~~16.102~~. TRANSIT-FIRST POLICY.**

(a) The following principles shall constitute the City and County's transit-first policy and shall be incorporated into the General Plan of the City and County. All officers, boards, commissions, and departments shall implement these principles in conducting the City and County's affairs:

1. To ensure quality of life and economic health in San Francisco, the primary objective of the transportation system must be the safe and efficient movement of people and goods.

2. Public transit, including taxis and vanpools, is an economically and environmentally sound alternative to transportation by individual automobiles. Within San Francisco, travel by public transit, by bicycle and on foot must be an attractive alternative to travel by private automobile.

3. Decisions regarding the use of limited public street and sidewalk space shall encourage the use of public rights of way by pedestrians, bicyclists, and public transit, and shall strive to reduce traffic and improve public health and safety.

4. Transit priority improvements, such as designated transit lanes and streets and improved signalization, shall be made to expedite the movement of public transit vehicles (including taxis and vanpools) and to improve pedestrian safety.

5. Pedestrian areas shall be enhanced wherever possible to improve the safety and comfort of pedestrians and to encourage travel by foot.

6. Bicycling shall be promoted by encouraging safe streets for riding, convenient access to transit, bicycle lanes, and secure bicycle parking.

7. Parking policies for areas well served by public transit shall be designed to encourage travel by public transit and alternative transportation.

8. New transportation investment should be allocated to meet the demand for public transit generated by new public and private commercial and residential developments.

9. The ability of the City and County to reduce traffic congestion depends on the adequacy of regional public transportation. The City and County shall promote the use of regional mass transit and the continued development of an integrated, reliable, regional public transportation system.

10. The City and County shall encourage innovative solutions to meet public transportation needs wherever possible and where the provision of such service will not adversely affect the service provided by the Municipal Railway.

*(b) The City may not require or permit off-street parking spaces for any privately-owned structure or use in excess of the number that City law would have allowed for the structure or use on July 1, 2007 unless the additional spaces are approved by a four-fifths vote of the Board of Supervisors. The Board of Supervisors may reduce the maximum parking required or permitted by this section.*

Section 3. The San Francisco Charter is hereby amended by repealing Section 16.110, in its entirety.

**SEC. 16.110. REVENUES FOR PUBLIC TRANSIT.**

*It is the policy of the City and County of San Francisco to use parking-related revenues, where available, to support public transit. To the extent allowed by law, there is hereby set aside from the general revenues of the City and County for the operations and capital improvements of the Department of Public Transportation for each fiscal year an amount equivalent to the City and County's share of revenues realized from:*

*1. Parking meters, except those amounts to be credited to the off-street parking fund as provided in Traffic Code Section 213 and those amounts collected from parking meters operated by the Recreation and Park Department and the Port Commission;*

*2. City-owned off-street parking facilities, including facilities leased to private owners and non-profit corporations, except those amounts to be credited to the off-street parking fund or otherwise dedicated as provided in Traffic Code Section 213 and except those amounts generated from any parking on or below any land or facilities under the jurisdiction of the Recreation and Park Department;*

*3. Fines, forfeited bail, or penalties for parking violations, except those amounts to be credited to the courthouse construction fund as provided in Administrative Code Section 10.117-35; and,*

*4. The tax on occupation of parking spaces, except for the amounts attributable to any surcharges imposed since 1978 and except for the amounts set aside for senior citizens' programs as provided in Section 615 of Part III of the Municipal Code.*

*In determining the amounts to be credited to the off-street parking fund as set forth in subparagraphs (1) and (2) above, sufficient revenues shall be credited to such fund to ensure adequate funding for the purposes for which such fund was created, including without limitation the following: capital outlays for the acquisition of property, construction, completion, and leasing of public parking lots, storage space, garages, structures, and other off-street parking facilities; maintenance and operation of such parking facilities; public works improvements that increase the supply of on-street parking; engineering and construction of on-street parking bays in parking meter districts in neighborhood commercial districts; installation and maintenance of on- and off-street parking meters; and the administration of the parking programs of the City and County.*

*The Treasurer shall set aside and maintain said amounts, together with any interest earned thereon, in a special fund, and any amounts unspent or uncommitted at the end of any fiscal year shall be carried forward to the next fiscal year and, subject to the budgetary and fiscal limitations of the Charter, shall be appropriated then or thereafter for the purposes specified in this section.*

*To the extent allowed by law, the Board of Supervisors may, by ordinance, dedicate additional revenues to the department of public transportation from sources including, but not limited to, gas taxes;*





## LEGAL TEXT OF PROPOSITION A

~~motor vehicle licensing fees or other available motor vehicle-related revenue sources.~~

Section 4. The San Francisco Charter is hereby amended by amending Section A8.404, to read as follows:

**SEC. A8.404. SALARIES AND BENEFITS OF CARMEN.**

The wages, conditions and benefits of employment as provided for in this section of the various classifications of employment of platform employees and coach or bus operators of the municipal railway as compensation, shall be determined and fixed annually as follows:

(a) On or before the first Monday of August of each year, the civil service commission shall certify to the board of supervisors for each classification of employment the average of the two highest wage schedules in effect on July 1st of that year for comparable platform employees and coach or bus operators of other surface street railway and bus systems in the United States operated primarily within the municipalities having each a population of not less than 500,000 as determined by the then most recent census taken and published by the director of the census of the United States, and each such system normally employing not less than 400 platform employees or coach or bus operators, or platform employees, coach and bus operators.

(b) The board of supervisors shall thereupon fix a wage schedule for each classification of platform employees and coach and bus operators of the municipal railway which shall not be ~~in excess of less than~~ the average of the two highest wage schedules so certified by the civil service commission for each such classification.

(c) When, in addition to their usual duties, such employees are assigned duties as instructors of platform employees or coach or bus operators they shall receive additional compensation that shall be subject to negotiation in addition to the rate of pay to which they are otherwise entitled under the wage schedule as herein provided.

(d) The rates of pay fixed for platform employees and coach and bus operators as herein provided shall be effective from July 1st of the year in which such rates of pay are certified by the civil service commission.

(e) The terms "wage schedule" and "wage schedules" wherever used in this section are hereby defined and intended to include only the maximum rate of pay provided in each such wage schedule.

(f) At the time the board of supervisors fixes the wage schedule as provided in (b) above, the board of supervisors may fix as conditions and benefits of employment other than wages as compensation for platform employees and coach or bus operators of the municipal railway, conditions and benefits not to exceed those conditions and benefits granted by collective bargaining agreements to the comparable platform employees and coach or bus operators of the two systems used for certification of the average of the two highest wage schedules by the civil service commission. The board of supervisors may establish such conditions and benefits notwithstanding other provisions or limitations of this charter, with the exception that such conditions and benefits shall not involve any change in the administration of, or benefits of the retirement system, health service system or vacation allowances as provided elsewhere in this charter. For all purposes of the retirement system as related to this section, the word "compensation" as used in Section 8.509 of this charter shall mean the "wage schedules" as fixed in accordance with paragraphs (a) and (b) above, including those differentials established and paid as part of wages to platform employees and coach and bus operators of the municipal railway, but shall not include the value of those benefits paid into the fund established as herein provided. Provided that when in the two systems used for certification as provided above, vacation, retirement and health service benefits are greater than such similar benefits provided by this charter for platform employees, coach or bus operators of the municipal railway, then an amount not to exceed the difference of such benefits may be converted to dollar values and the amount equivalent to these dollar values shall be paid into a fund. The fund shall be established to receive and to administer said amounts representing the differences in values of the vacation, retirement and health service benefits, and to pay out benefits that shall be jointly determined by representatives of the city and county government and the representa-

tives of the organized platform employees and coach and bus operators of the municipal railway. The civil service commission shall adopt rules for the establishment and general administration of the fund as herein provided. Such rules shall provide for a joint administration of the fund by representatives of the city and county government, which shall include representatives of the administrator of the agency responsible for the municipal railway and representatives of the organized platform employees, coach and bus operators of the municipal railway. Such rules may provide a procedure for final and binding arbitration of disputes which may arise between representatives of the city and county government and the representatives of the organized platform employees and coach and bus operators of the municipal railway. Such rules shall provide that all investments of the fund shall be of the character legal for insurance companies in California. Such rules and any amendments thereto shall be effective upon approval by the board of supervisors by ordinance.

(g) Notwithstanding any provisions of this charter, including other subparts of this section, the board of supervisors may, after meeting and conferring with and reaching agreement with the employee organization certified as the representative for municipal railway operators, fix wages and benefits of employment other than wages for platform employees and coach and bus operators of the municipal railway under this section for periods in excess of one year. Any ordinance fixing wages and benefits of employment other than wages adopted pursuant to this section for a period of more than one year shall contain a provision to the effect that during said period of time it shall be unlawful for the employees receiving the compensation so fixed to engage in a strike, work stoppage or conduct delaying or interfering with work at city and county facilities. Wages and benefits of employment other than wages established under this section shall not in any year exceed the limits established under paragraphs (b) and (f) of this section.

(h) Not later than the 25th day of August, the board of supervisors shall have the power and it shall be its duty, subject to the fiscal provisions of the charter but, without reference or amendment to the annual budget, to amend the annual appropriation ordinance and the annual salary ordinance as necessary to include the provisions for paying the rates of compensation and conditions and benefits other than wages fixed by the board of supervisors as in this section provided for platform employees and coach or bus operators for the then current fiscal year.

On recommendation of the civil service commission the board of supervisors shall establish a rate of pay for trainee platform men and bus or coach operators at a level reflecting the current labor market but below the basic hourly rate for motorman, conductor and bus operator.

Section 5. No later than 90 days after the effective date of this measure, the Board of Supervisors shall adopt legislation deleting all provisions of the San Francisco Traffic Code that are not consistent with Article 8A of the Charter and converting such provisions to rules and regulations of the Municipal Transportation Agency Board of Directors that shall be subject to amendment or repeal by the Municipal Transportation Agency Board of Directors; provided however that such transfers shall not disturb the powers of the Port Commission pursuant to Article 13, the powers of the Police Department pursuant to Article 2, 3, 6, 9 and 14, the powers of the Department of Public Works pursuant to Article 3, the powers of the Department of Public Health pursuant to Article 14, or the powers of the Interdepartmental Staff Committee on Traffic and Transportation pursuant to Article 21.

