



CLEAN AIR PLAN 2010
SOCIOECONOMIC IMPACT ANALYSIS

FINAL

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BAAQMD

Prepared by

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EXECUTIVE SUMMARY

This report analyzes the impacts of the economic costs and benefits of the proposed Bay Area 2010 Clean Air Plan (CAP). The analysis is based on estimates by the Bay Area Air Quality Management District (Air District or BAAQMD) of the annual compliance costs for both private and public sector entities, including businesses, households, local governments, and regional agencies.

The CAP is expected to provide economic benefits, as well as to impose compliance costs. In addition to estimating the costs to implement the plan, the District has also estimated the economic value of the improved health conditions that the plan is anticipated to engender through improved air quality.¹ Moreover, one set of control measures addresses climate change issues and energy efficiency, which could result in lower costs of energy use for most of the affected economic sectors, including the public, in the region. Other economic benefits of the plan include the fact that large portions of the transportation and mobile source programs are funded by state and federal funds that represent transfer income for the San Francisco Bay Area. In addition, some of the compliance costs for construction of new facilities and purchase of emission control equipment will be spent within the Bay Area, and therefore represent increased sales and revenues for certain businesses, while also representing costs for others.

In analyzing the direct impact to affected businesses, consumer groups and local governments as well as the net regional impact across all economic sectors, this report considers the interrelated flows of dollars and imputed benefits between economic sectors. Overall, the CAP is estimated to increase employment by 31,500 jobs in the Bay Area region, and increase economic output by \$3.95 billion per year, as shown in the net total impacts entry in the table below.

The components of these costs and benefits include the following:

- The total annual dollar cost of implementing the control measures (for which such estimates are available), is \$3.97 billion. The Gross Domestic Product (GDP) for the nine-county San Francisco Bay region is estimated at \$498.5 billion.
- Of the \$3.97 billion in total annual costs:
 - Net stationary source measure costs are estimated at \$44.8 million per year;
 - Net mobile source measure costs are estimated at \$108.2 million per year;
 - Net transportation control measures costs are estimated at \$3.8 billion per year;

¹ The estimated value of the improved health outcomes from the 2010 CAP are discussed in Volume I, Chapter 4 of the CAP, as well as in the District's Multi-Pollutant Evaluation Method Technical Document. Both these documents are available on the District's website at: www.baaqmd.gov/Divisions/Planning-and-Research/Plans/Clean-Air-Plans.aspx.

- Net energy and climate measures costs are estimated at \$22.7 million per year; and,
 - Land use and local impact measure costs are estimated at \$2.9 million per year.
- Of the total annual impacts, state and federal funds will cover \$2.97 billion, meaning that the balance of \$1.0 billion to be covered by local and regional sources represent the net impact to the region.
 - Air District staff analysis estimates that the health benefits of the control measures in the CAP (i.e., avoided health and social costs due to improved air quality) are in the range of \$770 million per year. For purposes of this analysis, this benefit is treated as an increase in productivity and income across all economic sectors, although in fact some portion of the benefit may represent a transfer from the health care sector to households and other business sectors.

The net effects of these trade flows are shown in the table below. Direct effects stem from the CAP measures themselves while indirect effects represent business to business transactions and induced impacts are generated by employee household spending.

**SUMMARY OF MULTIPLIER IMPACTS FROM ALL CONTROLS
(DOLLAR FIGURES IN MILLIONS)**

Control Benefits	Direct Impacts	Indirect Impacts	Induced Impacts	Total Impacts
Industry Output	\$3,318.1	\$982.9	\$1,612.7	\$5,913.8
Employment	26,500	4,800	10,100	41,400
Labor Income	\$1,730.1	\$370.2	\$559.0	\$2,659.3
Control Costs *	Direct Impacts	Indirect Impacts	Induced Impacts	Total Impacts
Industry Output	(\$1,065.1)	(\$407.9)	(\$487.1)	(\$1,960.1)
Employment	(5,300)	(1,700)	(2,900)	(9,900)
Labor Income	(\$401.9)	(\$141.4)	(\$172.3)	(\$715.7)
Net Control Impacts	Direct Impacts	Indirect Impacts	Induced Impacts	Total Impacts
Industry Output	\$2,253.0	\$575.1	\$1,125.7	\$3,953.7
Employment	21,200	3,100	7,200	31,500
Labor Income	\$1,328.1	\$228.7	\$386.7	\$1,943.5

Source: ADE Inc., data from IMPLAN input-output model

* In the table above, Control Costs shows the local share of costs only. It does not reflect costs that are expected to be covered by state and federal funds.

The direct benefits of \$3.3 billion in the top section of the table represent the combined total of health benefits, energy savings and state and federal infusions of funds into the region. The direct costs of \$1.06 billion in the middle section of the table are the compliance costs for industry and households, some of which are in the form of regional tax and fee revenues that help to fund transportation and air quality programs. It is important to note that any direct impact job losses noted in the table above represent a worse case scenario in which affected industries are not able to absorb costs stemming from the proposed CAP control measures. However, the analysis shows that for those control measures where cost

information is available, impacts are less than significant across the board, based on the threshold of significance described on pages 29-30.

The CAP measures will affect business sectors, regional households and local government differently:

- Costs and benefits to businesses include: \$2.69 billion in annual benefits resulting in approximately 16,900 new jobs, and \$137.9 million in costs resulting in loss of almost 670 jobs.
- Households would experience annual costs of \$865.1 million resulting in loss of slightly over 4,150 jobs from reduced household spending on retail goods and services. Over 90 percent of these costs are attributable to taxes and fees to pay for the regional share of transportation control measures. As noted above, state/federal transfers would contribute \$2.96 billion, or nearly 80 percent of the cost of the transportation control measures.
- Local government, including regional agencies such as MTC and the BAAQMD, will expend funds to operate transportation and air quality programs. Much of these efforts will be funded by state and federal revenues, but a portion will be funded by local tax and fee programs. Implementation of CAP control measures would result in benefits of \$660.4 million and costs of \$71.0 million to the public sector.

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INTRODUCTION

This report identifies a wide range of industries in the nine-county San Francisco Bay Area that are potentially impacted by proposed 2010 CAP control measures. Some industries could be impacted a number of times by different control measures.

The first section of the report describes the larger social and economic contexts within which officials are evaluating the 2010 CAP. Following this, in Chapter 2, we identify industries potentially impacted by various control measures, as well as describe whether these industries are growing or declining in terms of number of establishments and employment. Chapter 3 identifies cost associated with each control measure. The costs estimates were prepared by the Bay Area Air Quality Management District. (The Air District collaborated with the Metropolitan Transportation Commission to develop the cost estimates for the transportation control measures.) Chapter 3 also includes annual benefits stemming from each control measure, in terms of the economic value of improved health conditions.

Chapter 4 compares industry net profits against costs stemming from various control measures, to identify which industries, if any, could be significantly impacted by which control measures. A number of control measures directly and indirectly affect households in the region. In this section, we also analyze whether impacts on households would be significant or not.

In Chapter 5, we present findings with respect to how the proposed control measures directly and indirectly impact the Bay Area economy as a whole. As part of this analysis, we include the economic health benefits stemming from the control measures, leading to a net impact analysis of the 2010 CAP control measures. In Chapters 6 and 7, we summarize regional impacts by sectors and we analyze impacts of alternative scenarios per CEQA.

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1. GENERAL SOCIAL AND ECONOMIC TRENDS AND PROJECTIONS

This chapter describes the larger social and economic contexts within which policy-makers are considering the 2010 CAP. Between 2000 and 2004, the regional population grew by less than one percent a year, at 0.73 percent (Table 1). Between 2004 and 2008, the region grew annually by slightly over one percent, at 1.05 percent a year. In both periods, the region did not grow as fast as the rest of California. Overall, there are 7,375,678 people in the region. At 1,857,621, Santa Clara County has the most people, while Napa has the least, at 137,571.

**TABLE 1
POPULATION GROWTH: SAN FRANCISCO BAY AREA, 2000 - 2008**

	Persons			Annual Percent Change		
	2000	2004	2008	00-04	04-08	00-08
California	34,430,970	36,676,931	38,292,687	1.59%	1.08%	1.34%
Bay Area	6,871,151	7,073,168	7,375,678	0.73%	1.05%	0.89%
Alameda County	1,465,144	1,498,967	1,556,657	0.57%	0.95%	0.76%
Contra Costa County	966,095	1,016,407	1,060,435	1.28%	1.07%	1.17%
Marin County	248,879	251,586	258,618	0.27%	0.69%	0.48%
Napa County	125,975	132,280	137,571	1.23%	0.99%	1.11%
San Francisco County	785,534	806,433	845,559	0.66%	1.19%	0.92%
San Mateo County	712,289	720,042	745,858	0.27%	0.88%	0.58%
Santa Clara County	1,701,385	1,753,041	1,857,621	0.75%	1.46%	1.10%
Solano County	401,367	418,876	426,729	1.07%	0.47%	0.77%
Sonoma County	464,483	475,536	486,630	0.59%	0.58%	0.58%

Source: Applied Development Economics, based on total population estimates from The California Department of Finance (E-5 Report) (January 1, 2009).

Because population growth is a function of household formation, Table 2 below tracks the number of households in the region. Currently, there are an estimated 2,656,487 households in the nine-county region, an increase of 82,549 over the number of households in 2004 of 2,573,938. Bay Area households increased in numbers by 0.93 percent per year, which was slower than annual household growth for the state as a whole, which was 1.28 percent per year. Household formation was the greatest on a percentage basis in Contra Costa, Napa, and Solano Counties.

**TABLE 2
HOUSEHOLD GROWTH: SAN FRANCISCO BAY AREA, 2000-2008**

	Households			Annual Percent Change		
	2000	2004	2008	00-04	04-08	00-08
California	11,502,871	12,184,688	12,733,414	1.45%	1.11%	1.28%
Bay Area	2,466,020	2,573,938	2,656,487	1.08%	0.79%	0.93%
Alameda County	523,366	541,262	555,772	0.84%	0.66%	0.75%
Contra Costa County	344,129	367,742	387,147	1.67%	1.29%	1.48%
Marin County	100,650	103,089	104,239	0.60%	0.28%	0.44%
Napa County	45,402	48,923	50,807	1.88%	0.95%	1.42%
San Francisco County	329,700	338,024	347,916	0.63%	0.72%	0.67%
San Mateo County	254,104	259,813	263,848	0.56%	0.39%	0.47%
Santa Clara County	565,863	593,092	612,463	1.18%	0.81%	0.99%
Solano County	130,403	141,188	146,663	2.01%	0.96%	1.48%
Sonoma County	172,403	180,805	187,632	1.20%	0.93%	1.06%

Source: Applied Development Economics, based on total household estimates from The California Department of Finance (E-5 Report)

A number of impacts stemming from proposed 2010 CAP control measures would fall directly on households in the region. In addition, manufacturers, distributors, retailers and local governments may pass some costs stemming from the contemplated control measures onto households. To deal with potential costs, households might shift spending from retail or services. Overall, households in the region annually spend \$66 billion at various retail and service establishments (Table 3). While not readily apparent in the table below, the underlying analysis supporting the data accounts for spending differences by income and broad ethnic categories of Latino and not-Latino, as well as age group (see Appendix A for spending by broad ethnicity and age.)

**TABLE 3
HOUSEHOLD CONSUMER SPENDING: RETAIL AND SELECT SERVICES ONLY: SF BAY AREA, 2008
(DOLLARS IN \$ MILLIONS)**

	All Households	Select Consumer Spending By Age of Householder			
		<25	25-34	35-64	>65
Total (Retail and Select Services)	\$66,626	\$1,270	\$9,176	\$46,805	\$9,375
Apparel Store	\$2,726	\$69	\$450	\$1,923	\$283
General Merchandise	\$10,146	\$181	\$1,366	\$6,985	\$1,613
Specialty Retail	\$3,753	\$59	\$498	\$2,700	\$496
Food, Eating and Drinking	\$18,238	\$377	\$2,629	\$12,562	\$2,670
Building Materials/ Homefurnishings	\$5,470	\$68	\$578	\$4,158	\$667
Automotive	\$19,918	\$418	\$2,935	\$13,717	\$2,847
Professional Services	\$287	\$2	\$26	\$193	\$67
Medical Services	\$1,734	\$18	\$182	\$1,229	\$304
Personal Services	\$1,297	\$22	\$162	\$1,039	\$74
Select Entertainment and Recreation	\$881	\$21	\$109	\$672	\$78
Mail and Package Delivery	\$369	\$3	\$44	\$253	\$69
Select Repair Services	\$1,807	\$31	\$197	\$1,373	\$206

Source: ADE, Inc., based on US Bureau of Labor Statistics

Businesses in the region employ over three million workers (Table 4). The number of jobs in the region grew annually by 1.2 percent between 2004 and 2008, after having declined

dramatically between 2000 and 2004 by 2.7 percent a year. Of the 3.1 million positions in 2008, almost 13.4 percent are in the public sector. In the state, almost 15 percent of all jobs are in the public sector. Relative to the state as a whole, manufacturing, professional/ business services, and education/ health service sectors comprise a greater proportion of the employment base. In the region, these sectors comprise 10.2 percent (manufacturing), 18 percent (professional/ business services), and 11.4 percent (education/ health services), respectively, of total employment. In the state, these sectors respectively comprise 9.1 percent, 14.4 percent, and 10.8 percent of statewide job base. As a percent of total workforce, the region employs more people in sectors and industries that are more advanced and higher-paying than similar industries statewide: manufacturing positions in the nine-county Bay Area pay \$91,600 on average versus the statewide average of \$65,900. Likewise, professional/ business services and education/ health services pay average wages of \$88,100 and \$56,400 versus the statewide average of \$64,300 and \$48,500 respectively.² The epicenter of high-tech manufacturing, Santa Clara County, is driving the Bay Area's relatively high average annual wage of \$91,600: without the jobs in this county, the average wage for Bay Area manufacturing would fall to \$76,300 – still higher than the statewide average by over \$10,000.

**TABLE 4
REGIONAL EMPLOYMENT TRENDS: 2000-2008**

	Employment			Distribution 2008		Annual Percentage Change	
	2000	2004	2008	SFBA	California	00-04	04-08
Private and Public: All	3,353,821	3,003,430	3,148,847			-2.7%	1.2%
Total, all industries (private ownership):	2,939,710	2,588,823	2,727,987			-3.1%	1.3%
Goods-Producing	650,274	515,647	503,436			-5.6%	-0.6%
Natural Resources and Mining	22,267	17,599	16,120	0.5%	2.7%	-5.7%	-2.2%
Construction	173,663	169,409	165,536	5.3%	5.0%	-0.6%	-0.6%
Manufacturing	454,346	328,642	321,780	10.2%	9.1%	-7.8%	-0.5%
Service-Providing	2,289,437	2,073,174	2,224,553			-2.5%	1.8%
Trade, Transportation, and Utilities	582,710	521,223	526,559	16.7%	18.3%	-2.7%	0.3%
Information	147,606	110,639	112,028	3.6%	3.0%	-7.0%	0.3%
Financial Activities	190,053	197,996	186,333	5.9%	5.5%	1.0%	-1.5%
Professional and Business Services	661,810	502,453	567,658	18.0%	14.4%	-6.7%	3.1%
Education and Health Services	304,028	323,039	358,359	11.4%	10.8%	1.5%	2.6%
Leisure and Hospitality	282,104	284,461	314,110	10.0%	10.1%	0.2%	2.5%
Other Services	120,900	133,027	148,383	4.7%	4.8%	2.4%	2.8%
Unclassified	0	338	11,123	0.4%	0.5%		
Government:							
Federal Government	62,225	52,493	49,969	1.6%	1.6%	-4.2%	-1.2%
State Government	74,725	81,082	82,135	2.6%	3.0%	2.1%	0.3%
Local Government	277,161	281,032	288,756	9.2%	11.3%	0.3%	0.7%

Source: ADE, Inc. based on EDD LMID

Table 5 shows that the region's gross regional product amounts to \$67,589 per person, compared to the per capita gross regional product for California as a whole, of \$48,227. In

²California LMID-EDD, Quarterly Census of Employment and Wages at <http://www.labormarketinfo.edd.ca.gov/qcew/qcew-select.asp>

other words, the region's gross regional product is 1.4 times greater than that of the state as a whole on an average per capita basis. Between 2004 and 2008, per capita gross regional product increased by one percent a year, double the rate of growth for the state economy. The region contains 19 percent of the state's population, yet generates almost 27 percent of the state's gross regional product, to further underscore the disproportionate contribution of the region to California's economic vitality. See Appendix K for more discussion on gross regional product.

TABLE 5
SF BAY AREA GROSS REGIONAL PRODUCT: 2008

	SF Bay Area		California	
	Aggregate (in millions)	Per Capita	Aggregate (in millions)	Per Capita
04-08 Annual Percent Change	2.2%	1.0%	1.7%	0.5%
04-08 Change	\$39,525	\$2,697	\$114,968	\$1,010
2008	\$498,515	\$67,589	\$1,846,760	\$48,227
2007	\$506,461	\$70,396	\$1,871,292	\$49,395
2006	\$492,357	\$69,126	\$1,845,001	\$49,237
2005	\$477,122	\$67,455	\$1,795,379	\$48,411
2004	\$458,990	\$64,892	\$1,731,792	\$47,217

Source: ADE, Inc. based on US Bureau of Economic Analysis

It is important to note that while the Bay Area exhibits a stronger economic record along numerous indicators, such as gross regional product and wages, the region is not immune to the recent downturn in the state, national and global economies. As the table below shows, between first quarter 2008 and second quarter 2009, the private sector in the Bay Area shed six percent of its workforce, a rate of decline faster than the decline over the same period for the state as a whole. Over the same period, private sector jobs declined statewide by 5.4 percent, or 5.3 percent when Bay Area is excluded from the statewide numbers. Another way to see how the Bay Area has been disproportionately affected by the recent downturn is by recognizing that, whereas the region retains 19 percent of the state's population, 24 percent of all statewide private sector jobs losses occurred in the nine-county region.

TABLE 6
QUARTERLY PRIVATE SECTOR EMPLOYMENT TRENDS: SAN FRANCISCO BAY AREA VERSUS CALIFORNIA, 2008 Q1-2009 Q2

	2008 Q1	2008 Q2	2008 Q3	2008 Q4	2009 Q1	2009 Q2	08 Q1 - 09 Q2	
							Change	Percentage Chg
California	12,958,485	13,160,091	13,137,523	12,905,076	12,276,168	12,257,737	-700,748	-5.4%
California (excluding Bay Area)	10,083,431	10,252,943	10,227,672	10,034,319	9,538,928	9,551,389	-532,042	-5.3%
San Francisco Bay Area Region	2,875,054	2,907,148	2,909,851	2,870,757	2,737,240	2,706,348	-168,706	-5.9%

Source: ADE, Inc., based on CA EDD-LMID QCEW database

2. TREND OF INDUSTRIES POTENTIALLY IMPACTED BY PROPOSED 2010 CAP CONTROL MEASURES

The discussion above described the larger social and economic contexts within which proposed 2010 CAP control measures would operate. In this chapter, we analyze trends of Bay Area industries most likely affected by proposed 2010 CAP control measures. There are five sub-sections that correspond to each of the broad types of control measures (i.e. stationary source measures, mobile source measures, transportation control measures, energy & climate measures, and land use & local impacts measures). A number of the control measures directly affect households in the region, not just businesses.

2.1 STATIONARY SOURCE CONTROL MEASURES

Table 7 below identifies industries that will be potentially impacted by proposed stationary source control measures included in 2010 CAP. There is a wide breadth of industries, including industries in the public sector.

**TABLE 7
LIST OF INDUSTRIES POTENTIALLY IMPACTED BY PROPOSED 2010 CAP
STATIONARY SOURCE MEASURES**

Control Measures	NAICS Codes
SSM1 Metal Melting Facilities	
Foundries	3315
Ferrous/Non-Ferrous Forging	332111/332112
Materials Recovery	562920
SSM2 Digital Printing	
Digital Printing	323115
SSM3 Livestock Waste	
Dairies	112120
SSM4 Natural Gas Production and Distribution	
Crude Oil and Natural gas Extraction	211111
Natural Gas Liquid Extraction	211112
SSM5 Vacuum Trucks	
Petroleum Refineries	32111
Hazardous Waste Treatment And Disposal	562211
SSM6 General Particulate Matter Weight Rate Emission Limitation	
Stone Mining And Quarrying	21231
Sand, Clay, & Refractory Mineral Mining	21232
Construction	23
Manufacturing	31-33
Petroleum Refineries	32411
Cement & Concrete Product Manufacturing	3273
SSM7 Open Burning	
Crop farming	111000
SSM8 SO2 from Petroleum Coke Calcining Operations	
ConocoPhillips Carbon Plant	324199
SSM9 Cement Kilns	
Lehigh Southwest Cement (Plant #17)	327310
SSM10 Refinery Boilers and Heaters	
Petroleum Refineries	32111

**TABLE 7
LIST OF INDUSTRIES POTENTIALLY IMPACTED BY PROPOSED 2010 CAP
STATIONARY SOURCE MEASURES**

Control Measures	NAICS Codes
SSM11 Residential Fan Type Furnaces	
Households and commercial operations generally	
Air conditioning & warm air heating Equipment	333415
SSM12 Large Residential & Commercial Space Heating	
Households and commercial operations generally	
Air conditioning & warm air heating Equipment	333415
Heating equipment manufacturing	333414
SSM13 Dryers, Ovens and Kilns	
Industrial process furnace and oven manufacturing	311-32-332/336
SSM14 Glass Furnaces	
Glass Container Manufacturing	327213
SSM15 GHG in Permitting: Energy Efficiency	
Food Production	3111
Petroleum Refineries	32111
SSM16 New Source Review: Addressing PM2.5:	
Commercial/Industrial generally in impacted communities	
SSM17 New Source Review for Air Toxics Contaminants	
Commercial/Industrial generally in impacted communities	
SSM18 Revise Air Toxics "Hot Spots" Program	
Commercial/Industrial generally in impacted communities	

Source: ADE, Inc., based on BAAQMD

Trends on number of establishments, workers, and aggregate payroll are included in Table 8 below. In general, heavier industries such as refineries, mining & quarrying, and food production have not exhibited growth in the Bay Area, while services industries in the table below have grown, in part because population in the region increased between 2004 and 2008. The number of food production manufacturers declined slightly, dropping by 51 to 1,802 establishments. In contrast, the number of food production workers increased to 31,219, up from 30,110 in 2004. It is important to note that a few industries (such as refineries) are affected by several stationary source control measures.

TABLE 8
2004-2008 INDUSTRY TRENDS FOR INDUSTRIES POTENTIALLY IMPACTED BY PROPOSED STATIONARY SOURCE MEASURES: SSM 1 - SSM 14

Proposed CAP Control Measures	NAICS	2004			2008			'04-08		
		Estab.	Employment	Avg Pay	Estab.	Employment	Avg Pay	Estab.	Employment	Avg Pay
Private Sector Industries										
Crop Farming	111000	1,260	11,671	\$28,372	1,027	9,720	\$29,842	-5.0%	-4.5%	1.3%
Dairies	112120	115	716	\$25,131	99	594	\$29,591	-3.7%	-4.6%	4.2%
Crude Oil and Natural Gas Extraction	211111	0	0	\$0	2	5	\$112,095			
Natural Gas Liquid Extraction	211112	0	0		1	12	\$112,079			
Stone Mining and Quarrying	212310	13	41	\$52,245	9	43	\$52,245	-9.2%	1.2%	0.0%
Sand, Clay, & Refractory Mineral Mining	212320	2	6	\$59,632	1	5	\$64,235	-15.9%	-6.2%	1.9%
Construction	23	14,520	169,409	\$52,269	14,238	165,536	\$64,542	-0.5%	-0.6%	5.4%
Manufacturing	31-33	8,913	328,642	\$87,642	7,764	321,780	\$100,507	-3.4%	-0.5%	3.5%
Food production	311100	1,853	30,110	\$38,479	1,802	31,219	\$43,450	-0.7%	0.9%	3.1%
Digital Printing	323115	53	698	\$54,893	62	777	\$53,117	3.7%	2.7%	-0.8%
Petroleum refineries *	324110	15	3,974	\$59,163	9	2,280	\$59,163	-13.0%	-13.0%	0.0%
Asphalt paving materials made from purchased asphaltic materials	324121	15	86	\$64,197	12	69	\$74,493	-5.4%	-5.4%	3.8%
Glass container manufacturing	327213	4	48	\$62,689	5	59	\$61,524	5.7%	5.1%	-0.5%
Foundries	331500	39	259	\$53,618	36	128	\$50,460	-2.0%	-16.1%	-1.5%
Heat treating, annealing	332811	13	134	\$45,681	11	145	\$51,887	-4.1%	2.0%	3.2%
All other industrial machinery manufacturing	333298	25	351	\$57,708	21	331	\$68,466	-4.3%	-1.5%	4.4%
Heating Equipment (except warm air furnaces) manufacturing	333414	11	30	\$40,778	15	131	\$59,728	8.1%	44.1%	10.0%
Air Conditioning and Warm Air Heating Equipment	333415	15	243	\$46,364	15	310	\$51,933	0.0%	6.3%	2.9%
Industrial process furnace and oven manufacturing*	311-32-332/336	55	1,940	\$56,053	47	1,605	\$62,091	-4.0%	-4.6%	2.6%
Hazardous Waste Treatment and Disposal	562211	23	598	\$58,927	32	483	\$56,861	8.8%	-5.2%	-0.9%
Materials Recovery	562920	6	250	\$41,157	3	110	\$46,307	-15.9%	-18.6%	3.0%
Public Sector Industries: Local Government										
Hazardous Waste Treatment and Disposal	562211	1	66	\$50,246	1	68	\$48,911	0.0%	0.6%	-0.7%

Source: ADE, Inc., based on US BLS\EDD (*note: "industrial process furnace and oven manufacturing" comprises of Coffee Tea Mfg (311312), Commercial Bakeries (311423), Spice Mfg (311812), Fabric Coat Mill (311920), Soap Detergent Mfg (311942), Gypsum Prod Mfg 313320), Asphalt Pav Prod (324121), Ship Mfg (325188), Mineral Wool Mfg (325611), Dried, Dehyd Food (327420), Inorg Chem Mfg (327993), Sugar Refining (332431), Metal Can Mfg (336611))

* There are five are large petroleum refineries in the Bay Area. These are Chevron in Richmond (242,900 barrels per day), Tesoro in Rodeo (166,000 barrels per day), Shell Oil in Martinez (155,600 barrels per day), Valero's Benicia refinery (144,000), and ConnocoPhillips in Rodeo (76,000 barrels per day).

Through its Community Air Risk Evaluation (CARE) program, the Air District has identified six communities as disproportionately impacted by exposure to harmful air pollutants. These communities include specified areas within the cities of Richmond, San Jose, Concord, and San Francisco. A fifth impacted community encompasses neighborhoods in Redwood City and East Palo Alto. A sixth impacted community stretches from Berkeley to Hayward along the 880 corridor. Best available economic data for the impacted communities come from the US Census, whose ZIP Business Patterns databases identifies the number of businesses by ZIP Code and by nine size of employer categories.³ There are 70,608 private sector establishments in the impacted communities, and these businesses employ slightly over one million workers (Table 9).⁴

**TABLE 9
INDUSTRIES POTENTIALLY IMPACTED IN IMPACTED COMMUNITIES BY PROPOSED STATIONARY SOURCE
MEASURES SSM 15 - SSM 16, 2004-2007**

	2004		2007		'04-07	
	Estab.	Employment	Estab.	Employment	Estab.	Employment
<i>Private Sector Industries</i>	68,528	1,140,511	70,608	1,099,335	1.0%	-1.2%
Goods-Producing	8,500	177,961	8,490	169,327	0.0%	-1.6%
Natural Resources and Mining	50	401	45	1,660	-3.5%	60.5%
Construction	4,517	73,116	4,778	70,863	1.9%	-1.0%
Manufacturing	3,933	104,444	3,667	96,805	-2.3%	-2.5%
Service-Providing	60,028	962,550	62,118	930,008	1.1%	-1.1%
Trade, Transportation, and Utilities	14,208	203,363	14,262	205,888	0.1%	0.4%
Retail	8,110	96,840	8,219	98,494	0.4%	0.6%
Wholesale	4,680	63,001	4,585	62,634	-0.7%	-0.2%
Transportation/Warehousing	1,390	41,600	1,419	42,544	0.7%	0.8%
Utilities	28	1,921	39	2,216	11.7%	4.9%
Information	1,996	67,471	2,041	51,222	0.7%	-8.8%
Financial Activities	8,020	116,653	8,521	108,816	2.0%	-2.3%
Professional and Business Services	15,038	263,127	15,852	255,650	1.8%	-1.0%
Education and Health Services	7,565	135,812	7,860	128,953	1.3%	-1.7%
Leisure and Hospitality	7,031	123,888	7,467	130,014	2.0%	1.6%
Other Services	6,170	52,236	6,115	49,465	-0.3%	-1.8%

Source: ADE, Inc., based on US Census Zip Business Patterns

It is worth noting that employment in the impacted communities in aggregate declined at an annual rate of 1.2 percent between 2004 and 2007⁵, whereas in the nine-county region as a whole, employment increased by 1.2 percent a year. In part, this may be due to the fact that the impacted communities include highly urbanized central cities areas, where economic activities have not been as robust as in outlying suburban areas within the nine-county region.

2.2 MOBILE SOURCE CONTROL MEASURES

³The US Census organizes data in ZIP Business Patterns by number of establishments by size categories, of 1 to 4 workers, 5 to 9 workers, 10 to 19 workers, 20 to 49, 50 to 99, 100 to 249, 250 to 499, 500 to 999, and over 1000 workers. ADE estimated discrete number of workers by industry by ZIP Code based on these categories.

⁴It is important to note that boundaries of ZIP Codes do not seamlessly coincide with boundaries of their respective impacted communities. As a result, a number of workers included in Table 8 could actually be working outside of the impacted communities, all the while working within the ZIP Code.

⁵2007 data are most current ZIP Code data from the US Census ZIP Business Patterns

Table 10 identifies sources that are potentially affected by the proposed mobile source measures (MSMs) . In general, affected entities would either be consumers purchasing new fuel efficient vehicles, or operators of large fleets of public or private vehicles. In addition, MSMs could affect individual consumers or businesses purchasing construction and/or farming equipment. It is important to note that the MSMs would not be adopted and implemented as regulations by the Air District. Instead, the MSMs would be implemented primarily by means of partnerships, and by providing grants and incentives to offset the incremental cost of cleaner vehicles. Implementation of these measures will depend upon the level of available incentives. The MSMs will not be mandatory in nature, nor will they impose an “unfunded mandate.”

TABLE 10
LIST OF ENTITIES POTENTIALLY AFFECTED BY PROPOSED MOBILE SOURCE MEASURES

Mobile Source Measures	Potentially Impacted Entities
MSM A-1 - Clean fuel efficient vehicles	Consumers purchasing new fuel efficient vehicles
MSM A-2 - Zero emission vehicles	Consumers purchasing new fuel efficient vehicles
MSM A-3 - Green fleets	Local governments / private sector with large fleets Purchasing new fuel efficient vehicles
MSM A-4 Replacement or Repair of High-Emitting Vehicles	Private sector with autos subject to this measure
MSM B-1 HDV Fleet Modernization	Private sector with autos subject to this measure
MSM B-2 - Low NOX retrofits HD ORVs	Private sector with autos subject to this measure Local governments / private sector with large fleets
MSM B-3 - Efficient Drive Trains	Purchasing new fuel efficient vehicles
MSM C-1 - Construction and Farming Equipment	Private sector with equipment subject to this measure
MSM C-2 - Lawn Garden Equipment Emissions	Consumers purchasing new low-emission equipment
MSM C-3 - Recreational Watercraft Emissions	Consumers purchasing new low-emission watercraft

Source: ADE, Inc.

2.3 TRANSPORTATION CONTROL MEASURES

As in the case of the mobile source measures, the transportation control measures (TCMs) proposed in the 2010 CAP would not be regulatory in nature. Rather, the TCMs will be implemented by means of state and federal funding, allocation of revenues from existing user fees, grants and incentives, partnerships, public education, etc. For the most part, the TCMs would not exert a discrete cost on affected sources, such as public transit agencies, commuters, or goods-moving industries.

Among the industries potentially affected by the proposed TCMs in the 2010 CAP, many are transit-related industries (Table 11). Construction-related industries could benefit from the TCMs that entail construction or expansion of transit systems, roadway improvements, or bicycle and pedestrian facilities.

TABLE 11
LIST OF INDUSTRIES POTENTIALLY IMPACTED BY PROPOSED
TRANSPORTATION CONTROL MEASURES

Control Measures	NAICS
TCM A-1 - Bus service improvements	
Interurban and Rural Bus Transportation	48521
TCM A-2 - Regional rail improvements	
Urban Transit Systems	48511
TCM B-1 - Freeways and arterials operational strategies	
Highway, Street, and Bridge Construction	237310
Transportation Program Administration (state)	926120
TCM B-2 - Transit efficiency strategies	
Inland Water Transportation	48321
Urban Transit Systems	48511
Interurban and Rural Bus Transportation	48521
Scenic/Sightseeing Transportation, Water	487210
TCM B-3 - Bay Area Express Lane Network	
Highway, Street, and Bridge Construction	237310
Transportation Program Administration (state)	926120
TCM B-4 - Goods Movement Improvements	
Highway, Street, and Bridge Construction	237310
Transportation Program Administration (local)	926120
TCM C-1 - Support Voluntary Employer-Based Trip Reduction Programs	
Commercial/industrial/public sector generally	
TCM C-2 - Safe Routes to Schools	
Elementary and Secondary Schools (local government)	611110
TCM C-3 - Rideshare Services & Incentives	
Transportation Program Administration (local)	926120
TCM C-4 - Public Outreach & Education	
Transportation Program Administration (local)	926120
TCM C-5 - Smart Driving	
Transportation Program Administration (local/state)	926120
TCM D-1 - Bicycle Access & Facilities Improvements	
Transportation Program Administration (local)	926120
TCM D-2 - Pedestrian Access & Facilities Improvements	
Transportation Program Administration (local)	926120
TCM D-3 - Local Land Use Strategies	
Executive, Legislative, & Gen Government (local)	921110
Transportation Program Administration (local)	926120
TCM E-1 - Value Pricing Strategies	
Executive, Legislative, & Gen Government (local/state)	921110
Transportation Program Administration (local)	926120
TCM E-2 - Parking Policies	
Executive, Legislative, & Gen Government (local)	921110
Transportation Program Administration (local)	926120
TCM E-3 - Transportation Pricing Reform	
Executive, Legislative, & Gen Government (local)	921110
Transportation Program Administration (local)	926120

Source: ADE, Inc., based on BAAQMD

Employment trends for private and public sector bus services, water transit operations, as well as other privately-operated urban transit systems showed declines between 2004 and 2008, as shown in Table 12. There were 12 private bus-related establishments (NAICS 48521) in 2008, down by four from the 16 in 2004. In 2008, public sector bus services hired 400 more workers than in 2004, going from 3,535 to 3,941.

TABLE 12
2004-2008 INDUSTRY TRENDS FOR INDUSTRIES POTENTIALLY IMPACTED BY PROPOSED TRANSPORTATION CONTROL MEASURES, EXCEPT
EMPLOYER TRIP REDUCTION PROGRAM

Proposed CAP Control Measures	NAICS	2004			2008			'04-08		
		Estab.	Employment	Avg Pay	Estab.	Employment	Avg Pay	Estab.	Employment	Avg Pay
Private Sector Industries										
Highway, Street, and Bridge Construction	237310	170	5,762	\$79,332	143	5,530	\$81,983	-4.1%	-1.0%	0.8%
Inland Water Transportation	48321	6	221	\$124,718	3	97	\$92,853	-15.9%	-18.6%	-7.1%
Interurban and Rural Bus Transportation	48521	16	748	\$128,814	12	593	\$118,302	-6.6%	-5.7%	-2.1%
Urban Transit Systems	48511	7	333	\$195,975	7	346	\$163,399	0.0%	1.0%	-4.4%
Scenic/Sightseeing Transportation, Water	487210	30	82	\$25,864	33	580	\$31,196	2.6%	63.2%	4.8%
Public Sector: Local Governments										
Inland Water Transportation	48321	22	2,459	\$72,298	22	2,463	\$72,104	0.0%	0.0%	-0.1%
Interurban and Rural Bus Transportation	48521	20	3,535	\$70,819	20	3,941	\$71,579	0.0%	2.8%	0.3%
Elementary and Secondary Schools	611110	2,084	108,391	\$47,874	2,176	104,968	\$49,327	1.1%	-0.8%	0.8%
Executive, Legislative, & Gen Government	921110	126	24,003	\$66,419	125	23,177	\$67,618	-0.1%	-0.9%	0.4%
Transportation Program Administration	926120	12	897	\$83,047	11	865	\$82,262	-2.2%	-0.9%	-0.2%
Public Sector: State and Federal Governments										
Transportation Program Administration	926120	137	4,532	\$54,385	123	4,539	\$59,057	-2.6%	0.0%	2.1%

Source: ADE, Inc., based on US BLS/CA EDD

Because TCM C-1 (Voluntary Employer-Based Trip Reduction Programs) cuts across all public and private sector entities, Table 13 reproduces data on the number of public and private sector establishments operating in the San Francisco region. There are approximately 243,174 public and private sector establishments employing 3,148,847 workers. While the number of businesses increased annually by 2.8 percent, more than double the rate of annual employment growth (or 1.2 percent per year), it is important to note that the bulk of growth occurred in “Other services” and “Unclassified” sectors, which tend to be very small businesses that provide low-pay for their respective workers. The number of establishments in these sectors grew annually by 6.3 percent and 175 percent respectively between 2004 and 2008.

TABLE 13
2004-2008 INDUSTRY TRENDS FOR INDUSTRIES POTENTIALLY IMPACTED BY VOLUNTARY EMPLOYER TRIP REDUCTION MEASURE

	2004			2008			'04-08		
	Estab.	Employment	Avg Pay	Estab.	Employment	Avg Pay	Estab.	Employment	Avg Pay
Private and Public: All	218,089	3,003,430	\$58,740	243,174	3,148,847	\$68,410	2.8%	1.2%	3.9%
Total, all industries (private ownership):	213,327	2,588,823	\$59,310	238,314	2,727,987	\$69,094	2.8%	1.3%	3.9%
Goods-Producing	24,799	515,647	\$74,183	23,113	503,436	\$86,882	-1.7%	-0.6%	4.0%
Natural Resources and Mining	1,370	17,599	\$33,785	1,112	16,120	\$44,297	-5.1%	-2.2%	7.0%
Construction	14,520	169,409	\$52,269	14,238	165,536	\$64,542	-0.5%	-0.6%	5.4%
Manufacturing	8,913	328,642	\$87,642	7,764	321,780	\$100,507	-3.4%	-0.5%	3.5%
Service-Providing	188,528	2,073,174	\$55,611	215,203	2,224,553	\$65,069	3.4%	1.8%	4.0%
Trade, Transportation, and Utilities	31,552	521,223	\$43,833	30,840	526,559	\$49,147	-0.6%	0.3%	2.9%
Information	3,811	110,639	\$110,201	3,477	112,028	\$126,013	-2.3%	0.3%	3.4%
Financial Activities	18,775	197,996	\$90,825	18,775	186,333	\$111,539	0.0%	-1.5%	5.3%
Professional and Business Services	36,047	502,453	\$74,128	36,804	567,658	\$89,492	0.5%	3.1%	4.8%
Education and Health Services	19,227	323,039	\$47,070	19,855	358,359	\$56,994	0.8%	2.6%	4.9%
Leisure and Hospitality	16,301	284,461	\$20,983	16,886	314,110	\$24,555	0.9%	2.5%	4.0%
Other Services	62,667	133,027	\$28,726	79,983	148,383	\$30,191	6.3%	2.8%	1.3%
Unclassified	151	338	\$79,908	8,593	11,123	\$49,647	174.7%	139.5%	-11.2%
Government:									
Federal Government	501	52,493	\$61,511	546	49,969	\$68,321	2.2%	-1.2%	2.7%
State Government	1,613	81,082	\$58,103	1,585	82,135	\$65,324	-0.4%	0.3%	3.0%
Local Government	2,648	281,032	\$53,151	2,729	288,756	\$62,833	0.8%	0.7%	4.3%

Source: ADE, Inc., based on US BLS/CA EDD

2.4 ENERGY AND CLIMATE MEASURES

The energy and climate measures (ECMs) proposed in the draft 2010 CAP potentially affect the all Bay Area industries and households, particularly ECM-1 (“Energy efficiency”) and ECM-3 (“Urban heat island mitigation”). When implemented, ECM-1 and ECM-2 would result in savings to Bay Area industries and households. ECM-2 (“Renewable Energy”) would affect new residential and non-residential construction projects, although this measure is strictly voluntary and costs associated with this measure would be offset by incentives and grants. ECM-4 (“Shade-tree planting”) mostly affects the public sector, which would be encouraged to plant more trees.

TABLE 14
LIST OF INDUSTRIES POTENTIALLY IMPACTED BY
PROPOSED ENERGY AND CLIMATE MEASURES

Control Measures	NAICS
ECM-1 Energy Efficiency	
All private sector industries	221
All public sector industries	236115
Bay Area Households	236116
ECM-2 Renewable Energy	
Residential/non-residential construction	221
ECM-3 Urban Heat Island Mitigation	
All private sector industries	921110
All public sector industries	
Bay Area Households	
ECM-4 Shade-Tree Planting	
Executive, Legislative, & Gen Government	921110

Source: ADE, Inc.

For trends with respect to Bay Area households and industries, particularly since these sources will benefit from ECM-1 and ECM-3 see Tables 2, 4 and 13 above. As noted above, ECM-2 would not require the construction industry to adopt new energy-efficient technologies when building new residential and/or non-residential projects. Nonetheless, it should be noted this industry has been hard-hit by the recent downturn in the economy. Employment in single-family housing construction dropped by seven percent per year between 2004 and 2008 (see Table 15). Local government agencies will potentially play a role in implementing all four of the ECMs. Table 15 below also includes local government employment trends, which have dropped almost one percent per year between 2004 and 2008.

TABLE 15
2004-2008 INDUSTRY TRENDS FOR INDUSTRIES POTENTIALLY IMPACTED BY PROPOSED ENERGY & CLIMATE MEASURES

	2004			2008			'04-08			
	Estab.	Employment	Avg Pay	Estab.	Employment	Avg Pay	Estab.	Employment	Payroll	
<i>Private Sector Industries: ECM-2 Industries</i>										
New Single-Family Housing Construction	236115	2,713	22,059	\$56,582	2,769	16,292	\$55,827	0.5%	-7.3%	-0.3%
New Multifamily Housing Construction	236116	579	7,966	\$49,100	579	8,381	\$47,416	0.0%	1.3%	-0.9%
<i>Public Sector: Local Governments: ECM-4 Industries</i>										
Executive, Legislative, & Gen Government	921110	126	24,003	\$66,419	125	23,177	\$67,618	-0.1%	-0.9%	0.4%

Source: ADE, Inc.

2.5 LAND USE & LOCAL IMPACT MEASURES

The proposed land use and local impact measures (LUMs) included in the 2010 CAP will affect a limited number of industries, namely home builders and some non-residential construction industries (Table 16). Freight trucking would also be affected, as would local governments and a few state and federal entities. All the private sector industries potentially impacted by the LUMs either grew very slightly or declined between 2004 and 2008 (Table 17).

**TABLE 16
LIST OF INDUSTRIES POTENTIALLY
IMPACTED BY PROPOSED LAND USE &
LOCAL IMPACT MEASURES**

LUM-1 Goods Movement
General Freight Trucking
Transportation Program Administration

LUM-2 Indirect Source Review Regulation
New Single-Family Housing Construction
New Multifamily Housing Construction
Nonresidential Building Construction
Executive, Legislative, & Gen Government

LUM-3 Updated CEQA Guidelines
New Single-Family Housing Construction
New Multifamily Housing Construction
Nonresidential Building Construction
Executive, Legislative, & Gen Government

LUM-4 Land Use Guidance
Executive, Legislative, & Gen Government

LUM-5 Reduce Health Risk in Impacted Communities
Executive, Legislative, & Gen Government

LUM-6 Enhanced Air Quality Monitoring
Executive, Legislative, & Gen Government
Transportation Program Administration

Source: ADE, Inc.

TABLE 17
2004-2008 INDUSTRY TRENDS FOR INDUSTRIES POTENTIALLY IMPACTED BY PROPOSED LAND USE MEASURES

	2004			2008			'04-08		
	Estab.	Employment	Avg Pay	Estab.	Employment	Avg Pay	Estab.	Employment	Payroll
<i>Private Sector Industries</i>									
New Single-Family Housing Construction	2,713	22,059	\$56,582	2,769	16,292	\$55,827	0.5%	-7.3%	-0.3%
New Multifamily Housing Construction	579	7,966	\$49,100	579	8,381	\$47,416	0.0%	1.3%	-0.9%
Nonresidential Building Construction	851	14,461	\$77,309	800	17,386	\$87,567	-1.5%	4.7%	3.2%
General Freight Trucking	1,266	16,705	\$49,100	1,158	16,545	\$47,416	-2.2%	-0.2%	-0.9%
<i>Public Sector: Local Governments</i>									
Transportation Program Administration	12	897	\$83,047	11	865	\$82,262	-2.2%	-0.9%	-0.2%
Executive, Legislative, & Gen Government	126	24,003	\$66,419	125	23,177	\$67,618	-0.1%	-0.9%	0.4%
<i>Public Sector: State and Federal Governments</i>									
Transportation Program Administration	167	6,339	\$59,228	157	6,997	\$68,963	-1.5%	2.5%	3.9%

Source: ADE, Inc.

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3. ANNUAL COST OF PROPOSED CONTROL MEASURES

This chapter discusses annual costs stemming from each of the proposed control measures contemplated in the 2010 CAP (Tables 18-22). The costs estimates come from the Bay Area Air Quality Management District. The Air District and MTC collaborated to develop cost estimates for the transportation control measures. For a number of control measures, the Air District has not yet developed annual costs estimates.

The costs to implement the emission control measures are all shown as annual costs for purposes of the socioeconomic analysis. However, the total annual cost for any particular measure may be composed of a combination of one-time capital costs and ongoing operations and maintenance costs. Depending on the type of measure, the one-time capital costs may be expressed in terms of average annual expenditures over each phase (Phase 1 from 2010 through 2012, or Phase 2 from 2013 to 2020), or they may be annualized costs over a fixed financing period such as ten years. This latter case is typical for emissions control equipment purchased by private industries to reduce emission from industrial processes while the former approach is typical of public sector infrastructure expenditures, such as transit or roadway improvements.

In relation to the emission control measures, capital costs may include any of the following:

- Industrial emissions control equipment, and/or process changes
- The marginal (incrementally higher) cost of advanced low-emission or fuel-efficient vehicles or engines
- The cost of incentives to induce (or accelerate) purchase of cleaner vehicles or equipment
- Infrastructure for transit, roadways or other facilities
- Transit equipment and rolling stock
- Costs of programs to buy and retire older vehicles or equipment
- Increased household costs for products whose production costs are increased due to air emissions compliance

Operations and maintenance costs typically include the following types of categories:

- Private sector labor, materials and energy costs for increased equipment inspections, recordkeeping, maintenance of emission control equipment and the like

- Staff and consultant costs for local government and regional public agencies to design and administer various air quality programs such as green fleet certification, incentive programs, or land use planning to reduce greenhouse gas emissions
- Consumer or commuter costs for transportation control measures such as increased bridge tolls, regional gas taxes, or other congestion pricing programs

It is also important to note that in some cases the emission control measures work to reduce annual costs, such as those that improve energy efficiency, although there may be an initial capital expenditure necessary to achieve the annual cost savings. In this case, the annual savings shown in the tables below reflect the net reduction in costs.

The tables below also include estimated annual health and climate protection benefits stemming from each control measure, as calculated based upon the Air District's multi-pollutant evaluation method (MPEM).⁶ These estimated benefits are taken from Table 4-8 in Volume I of the draft 2010 CAP. The health benefits include reduced health treatment costs, enhanced productivity, and extended average lifespan (due to reduction in premature mortality). The climate benefits are valued at \$18 per metric ton of CO₂-equivalent reduced, based on the estimated value of avoided climate change impacts, as discussed in Section 5.3 of the *Multi-Pollutant Evaluation Method Technical Document*.

While in a number of instances specific industries and households bear costs stemming from particular control measures, annual benefits are spread across the entire economy. Improved air quality reduces public health impacts due to air pollution; this provides benefits in terms of reduced health care costs, increased worker productivity, and longer life expectancy. This in turn leads to new spending that stimulates the local and regional economies, creating new jobs and leading to even more spending. However, for the purposes of socioeconomic impact analysis of each control measure, we do not offset cost impacts to specific industries with dollar benefits derived by the region as a result of measure implementation except in the aggregate, as part of the regional input-output analysis which is presented in Chapter 5.⁷

⁶ See the *Multi-Pollutant Evaluation Method Technical Document* (April 2010) on the Air District website at www.baaqmd.gov/Divisions/Planning-and-Research/Plans/Clean-Air-Plans/Resources-and-Technical-Docs.aspx.

⁷ Since compliance costs are not available for every measure, the analysis in Chapter 5 does not include health benefits for measures for which estimated compliance costs are not available. For stationary source measures, available estimated compliance costs total \$44.7 million as shown in Table 18. Corresponding health and climate protection benefits for the measures with estimated costs are \$75.3 million. Similarly for the Land Use Measures in Table 22, available estimated implementation costs are \$2.9 million and corresponding health benefits are estimated at \$118 million.

**TABLE 18
ANNUAL COST & BENEFIT FOR PROPOSED STATIONARY SOURCE CONTROL MEASURES**

	Annual Cost	Annual Benefits (MPEM)
SSM 1 Metal Melting Facilities	TBD	TBD
SSM 2 Digital Printing	TBD	TBD
SSM 3 Livestock Waste	\$1,200,000	\$1,126,000
SSM 4 Natural Gas Production and Distribution	TBD	\$1,636,000
SSM 5 Vacuum Trucks	\$21,900,000	\$10,459,125
SSM 6 General Particulate Matter Weight Rate Limitation	TBD	\$47,811,000
SSM 7 Open Burning	TBD	\$15,089,000
SSM 8 SO2 from Petroleum Coke Calcining Operations	\$5,700,000	\$35,993,000
SSM 9 Cement Kilns	\$2,800,000	\$11,641,000
SSM10 Refinery Boilers and Heaters	TBD	\$7,709,000
SSM11 Residential Fan Type Furnaces	\$5,000,000	\$11,163,000
SSM12 Large Residential and Commercial Space Heating	\$6,833,333	\$3,191,000
SSM13 Dryers Ovens Kilns	\$570,000	\$532,000
SSM14 Glass Furnaces	\$760,000	\$1,197,000
SSM15 GHG in Permitting: Energy Efficiency	TBD	TBD
SSM16 New Source Review addressing PM2.5	TBD	TBD
SSM17 New Source Review for Air Toxic Contaminants:	TBD	TBD
SSM18 Revise Air Toxics "Hot Spots" Program	TBD	TBD
Total	\$44,763,333	\$ 147,547,000

Source: ADE, Inc., based on Bay Area Air Quality Management District

**TABLE 19
ANNUAL INCENTIVE FUNDS FOR PROPOSED MOBILE SOURCE CONTROL MEASURES**

	Annual Incentive Funds *	Annual Benefits (MPEM)
MSM A-1 - Clean fuel efficient vehicles	\$10,000,000	\$1,005,000
MSM A-2 - Zero emission vehicles	\$14,400,000	\$883,000
MSM A-3 - Green fleets	\$550,000	\$3,422,000
MSM A-4 - Replacement or Repair of High-Emitting Vehicles	\$333,333	\$17,279,000
MSM B-1 - HDV Fleet Modernization	\$58,333,333	\$30,042,000
MSM B-2 - Low NOX retrofits in Heavy-Duty Trucks	\$12,500,000	\$2,632,000
MSM B-3 - Efficient Drive Trains	\$6,666,667	\$2,374,000
MSM C-1 - Construction and Farming Equipment	\$2,400,000	\$5,149,000
MSM C-2 - Lawn & Garden Equipment Emissions	\$2,000,000	\$94,000
MSM C-3 - Recreational Watercraft Emissions	\$1,000,000	\$1,632,000
Total	\$108,183,333	\$64,511,000

Source: ADE, Inc., based on Bay Area Air Quality Management District

* Estimated annual incentive funds in Table 19 are based on a combination of Air District grant programs and anticipated funding from other sources.

As indicated earlier, many of the transportation control measures involve the allocation of funds from federal, state, and regional agencies towards achieving certain objectives with respect to regional transit planning, service delivery, and infrastructure. As a result, many of the measures shown in Table 20 do not exert a discrete cost on affected sources, such as commuters or goods-moving industries.

**TABLE 20
ANNUAL COST FOR PROPOSED TRANSPORTATION CONTROL MEASURES**

	Annual Cost	Annual Benefits (MPEM)
TCM A-1 - Bus service improvements	\$340,433,333	\$617,000
TCM A-2 - Regional rail improvements	\$1,200,000,000	\$12,430,000
TCM B-1 - Freeways and arterials operational strategies	\$51,666,667	\$55,387,000
TCM B-2 - Transit efficiency strategies	\$25,667,000	\$152,000
TCM B-3 - Bay Area Express Lane Network	\$108,000,000	\$70,685,000
TCM B-4 - Goods Movement Improvements	\$40,000,000	\$82,172,000
TCM C-1 - Support Voluntary Employer-Based Trip Reduction Program	\$3,600,000	\$2,240,000
TCM C-2 - Safe Routes to Schools	\$13,333,000	\$211,000
TCM C-3 - Rideshare Services & Incentives	\$5,667,000	\$3,808,000
TCM C-4 - Public Outreach & Education	\$4,333,333	\$981,000
TCM C-5 - Smart Driving	\$1,000,000	\$3,753,000
TCM D-1 - Bicycle Access & Facilities Improvements	\$1,500,000	\$110,000
TCM D-2 - Pedestrian Access & Facilities Improvements	\$40,000	\$49,000
TCM D-3 - Local Land Use Strategies	\$5,866,667	\$36,598,000
TCM E-1 - Value Pricing Strategies	\$26,000,000	\$733,000
TCM E-2 - Parking Policies *	\$1,478,171,000	\$7,268,000
TCM E-3 - Transportation Pricing Reform	\$471,143,000	\$5,561,000
Total	\$3,776,421,000	\$281,755,000

Source: ADE, Inc., based on Bay Area Air Quality Management District

* The estimated compliance cost for TCM E-2 is based on a “worst-case” scenario. The actual cost to implement this measure is likely to be much lower. See discussion re: TCM E-2 on p. 42.

**TABLE 21
ANNUAL COST AND/OR BENEFITS FOR PROPOSED ENERGY AND CLIMATE MEASURES**

	Annual Cost and/or Benefits	Annual Benefits (MPEM)
ECM-1 Energy Efficiency	(\$20,086,000)	\$65,906,000
ECM-2 Renewable Energy	\$11,392,000	\$6,000
ECM-3 Urban Heat Island Mitigation	(\$39,649,000)	\$3,137,000
ECM-4 Tree Planting	\$71,049,000	\$9,093,000
Total	\$22,706,000	\$78,142,000

Source: ADE, Inc., based on Bay Area Air Quality Management District

**TABLE 22
ANNUAL COST FOR PROPOSED LAND USE & LOCAL IMPACT MEASURES**

	Annual Cost	Annual Benefits * (MPEM)
LUM-1 Goods Movement	\$1,449,000	\$65,101,000
LUM-2 Indirect Source Review Regulation	\$1,412,000	\$52,864,000
LUM-3 Updated CEQA Guidelines	TBD	\$76,216,000
LUM-4 Land Use Guidance	TBD	&2,805,000
LUM-5 Reduce Health Risk in Impacted Communities	TBD	TBD
LUM-6 Enhanced Air Quality Monitoring	TBD	TBD
Total	\$2,861,000	\$196,986,000

Source: ADE, Inc., based on Bay Area Air Quality Management District

* Benefits are only shown for measures for which implementation costs have been estimated.

4. SOCIOECONOMIC ANALYSIS OF PROPOSED CLEAN AIR PLAN 2010

This section of the report analyzes socioeconomic impacts stemming from each of the control measures within the five categories of control measures. We examine private sector impacts separately from public sector impacts. In part, we do so because costs associated with specific control measures are compared against private sector estimated net profits. With respect to public sector entities, costs are measured against estimated general fund revenues of affected public entities. In some instances, the Air District has not developed cost estimates for specific control measures. We included industries affected by proposed control measures in any event, as a placeholder for future analysis.

Please note that control measures that will be adopted as rules by the Air District, including the stationary source measures and LUM -2 (indirect source review regulation), will undergo more detailed socio-economic analysis as part of the District's rule development process.

4.1 METHODOLOGY

Applied Development Economics (ADE) began the analysis by preparing a statistical description of the industry groups of which the affected sources are a part, analyzing data on the number of establishments, jobs, and payroll. We also estimated sales generated by impacted industries, as well as net profits for each affected industry.

This report relies heavily on the most current data available from a variety of sources, such as the 2002 Economic Census, US Bureau of Labor Statistics, and the State of California's Employment Development Department (EDD) Labor Market Information Division. We updated the 2002 US Economic Census data with data from the US Census' Annual Survey of Manufacturers and the US Census Annual Services Report. For purposes of estimating profits, ADE reviewed industry-specific financial ratios issued by the US Internal Revenue Service.

With this information, ADE was able to estimate net after-tax profit ratios for emissions sources affected by the proposed control measures. ADE calculated ratios of profit per dollar of revenue for affected industries. The result of the socioeconomic analysis shows what proportion of profits the compliance costs represent. Based on assumed thresholds of significance, ADE discusses in the report whether the affected sources are likely to reduce jobs as a means of recouping the cost of rule compliance or as a result of reducing business operations. To the extent that such job losses appear likely, the indirect multiplier effects of the jobs losses are estimated using a regional IMPLAN input-output model. In some instances, particularly where consumers are the ultimately end-users of goods and services subject to proposed control measures, we also analyzed to determine whether compliance costs could be passed to households in the region.

When analyzing the socioeconomic impacts of proposed new rules and amendments, ADE attempts to work closely within the parameters of accepted methodologies discussed in a 1995 California Air Resources Board report called “Development of a Methodology to Assess the Economic Impact Required by SB513/AB969” (by Peter Berck, PhD, UC Berkeley Department of Agricultural and Resources Economics, Contract No. 93-314, August, 1995). The author of this report reviewed a methodology to assess the impact that California Environmental Protection Agency proposed regulations would have on the ability of California businesses to compete. The California Air Resources Board (CARB) has incorporated the methodologies described in this report in its own assessment of socioeconomic impacts of its own air quality rules. One methodology relates to determining the threshold above which a rule and its associated costs is deemed to have significant impacts. Berck reviewed the threshold in his analysis and wrote, “The Air Resources Board’s (ARB) use of a 10 percent change in [Return on Equity] ROE (i.e. a change in ROE from 10 percent to a ROE of 9 percent) as a threshold for a finding of no significant, adverse impact on either competitiveness or jobs seems reasonable or even conservative.”

For purposes of the socioeconomic analysis in the present report, ADE defines net profit as return on sales (ROS). We compare regulatory costs against ROS because this yields a more conservative analysis, especially for medium- to large-size establishments (see Appendix J for detail). As part of the ROS analysis, we review a number of sources when estimating rates of return (ROS), including the US IRS, Dun and Bradstreet, CCH, and RMA, which publish various financial ratios at the national level for detailed industries. We apply industry-specific returns rates (ROS) against revenues generated by industries in the region, to estimate net profits based on sales.

In terms of analyzing impacts to local, state, and federal governments, we relied on the 2002 US Census of the Public Sector as well as the California State Controller’s Annual Local Government and Redevelopment Agency Reports. We calculated general fund expenditures for local governments and redevelopment agencies throughout the nine-county region. For state and federal expenditures, we analyzed the Legislative Analysts Office and the White House 2008-2009 Budget. We compared costs stemming from the proposed measures against public sector expenditures on the grounds that general fund expenditures reflect priorities of elected and appointed officials, who are in a position to alter their priorities in some manner when confronted with new priorities, such as costs stemming from the proposed 2010 CAP. We also analyzed the Comprehensive Annual Financial Report (CAFR) of the Metropolitan Transportation Commission for the years 2004 through 2009.

The discussion below is separated into sub-sections that correspond to the five control measure categories in the CAP. Each sub-section includes a direct impact analysis, meaning that we analyze potential costs stemming from control measures against revenue and net profit estimates for affected emissions sources. Since a number of industries could be affected by multiple control measures, in these instances we compare combined costs against industry revenues and or net profits, resulting in a cumulative impact analysis by industry. Where appropriate, we also analyze impacts to small businesses, as state law requires

socioeconomic analyses to determine if small businesses are disproportionately impacted by proposed rules. (For definition of small business, see Appendix J.) At this point, there is not enough detailed information to discern specific ways that proposed control measures will affect different-sized businesses. Thus, to determine the extent to which small business comprise an affected industry, we distribute the number of establishments within affected industries by their nine different size categories, starting with the smallest employers employing one to four workers and ending with largest size category of employers, those with more than 1,000 workers. It is important to remember that some control measures do not lend themselves to a small business disproportionate impact analysis, as they either affect households or local governments, or, in the case of a number of transportation control measures, do not exert discrete impacts on specific sources.

Stationary Source Control Measure 18 (“revise air toxics ‘hot spots’ program”), Land Use Measure 5 (“reduce health risk in impacted communities”) and Land Use Measure 6 (“enhanced air quality monitoring”) affect specific areas defined as “impacted communities” by the Air District’s CARE program. At this juncture, there is not enough detail to perform a detailed socioeconomic impact analysis on how any of these measures specifically affect households and industries in any one of the six impacted communities. However, we compare economic trends in these areas against the larger region, to see if there are any notable trends of relevance to SSM-18, LUM-5 and/or LUM-6.

4.2 STATIONARY SOURCE MEASURES

For the most part, impacts are below the threshold used for determining whether costs stemming from a rule significantly impact affected industries (see Table 23). The table below shows that industries potentially subject to the various SSMs generate in aggregate an estimated \$171.2 billion in revenues, as well as \$10.4 billion in net profits. Since costs are not yet available for all industries, revenues generated by industries subject to control measures with known costs amount to \$39.6 billion, with net profits at \$2.4 billion. At 1.8 percent, the overall cost-to-overall net profit ratio is below the threshold employed to determine whether costs stemming from the proposed SSMs are significant.

TABLE 23
INDUSTRIES POTENTIALLY IMPACTED BY PROPOSED STATIONARY SOURCE MEASURES

Industry	NAICS	Affected Industry Revenues (est.) (in thousands)	Affected Industry Net Profits (est.) (in thousands)	Annual SSM Costs Borne By Affected Industry	Annual Cost as Percent of Net Profits
Crop Farming	111000	\$1,658,167	\$85,595	<i>TBD</i>	
Dairies	112120	\$154,782	\$2,848	\$1,200,000	<i>passed to consumers</i>
Crude Oil and Natural Gas Extraction	211111	\$2,255	\$42	<i>TBD</i>	
Natural Gas Liquid Extraction	211112	\$18,951	\$351	<i>TBD</i>	
Stone Mining and Quarrying	212310	\$9,684	\$550	<i>TBD</i>	
Sand, Clay, & Refractory Mineral Mining	212320	\$36,513	\$2,073	<i>TBD</i>	
Construction	230000	\$14,043,404	\$1,279,760	<i>TBD</i>	
Manufacturing	310000	\$115,653,222	\$6,563,320	<i>TBD</i>	
Cement manufacturing	327310	\$2,200,000	\$318,676	\$2,830,000	0.9%
Food production	311100	\$26,454	\$1,500	<i>TBD</i>	
Digital Printing	323115	\$112,279	\$0	<i>TBD</i>	
Petroleum refineries	324110	\$17,073,243	\$967,971	\$27,600,000	2.9%
Glass container manufacturing	327213	\$19,165,333	\$1,086,582	\$760,000	0.1%
Foundries	331500	\$22,707	\$1,287	<i>TBD</i>	
Heating Equipment (except warm air furnaces) manufacturing	333414	\$52,834	\$1,210	\$2,027,799	<i>passed to consumers</i>
Air Conditioning and Warm Air Heating Equipment	333415	\$125,208	\$2,867	\$9,805,534	<i>passed to consumers</i>
Industrial process furnace and oven manufacturing	311-32-332/336	\$831,897	\$47,210	\$570,000	1.2%
Materials Recovery	562920	\$17,418	\$769	<i>TBD</i>	
Total		\$171,204,353	\$10,362,611		
<i>Only industries where costs are included</i>		<i>\$39,603,298</i>	<i>\$2,427,364</i>	<i>\$44,793,333</i>	<i>1.8%</i>
<i>Excluding industries that pass costs to consumers</i>		<i>\$39,270,473</i>	<i>\$2,420,439</i>	<i>\$31,760,000</i>	<i>1.3%</i>

Source: ADE, Inc.

SMALL BUSINESS IMPACT ANALYSIS

Table 24 below distributes affected industries by size of establishments. For example, 78 percent of all Bay Area crop farm establishments (NAICS 111000) employ less than 50 workers. More detail on any one of the proposed stationary source control measures will emerge as these rules proceed through the rule development process, resulting in greater understanding as to how small businesses will be affected by any one of the measures. As it stands, the bulk of businesses in impacted industries employ less than 50 workers, meaning that most are small businesses. It is worth noting that in general most measures (for which cost estimates are available) do not significantly impact small businesses, assuming the compliance costs are scalable to the size of the business operation.

**TABLE 24
DISTRIBUTION OF FIRMS BY EMPLOYMENT SIZE CATEGORY FOR INDUSTRIES POTENTIALLY IMPACTED BY
PROPOSED STATIONARY SOURCE MEASURES**

	NAICS	1 - 49	50 - 99	100 - 249	250 - 499	>500
<i>Private Sector Impacts</i>						
Crop Farming	111000	78.1%	18.9%	2.0%	0.8%	0.1%
Dairies	112120	94.5%	3.0%	1.6%	0.7%	0.2%
Crude Oil and Natural Gas Extraction	211111	83.3%	8.3%	0.0%	0.0%	8.3%
Natural Gas Liquid Extraction	211112	84.2%	5.3%	0.0%	5.3%	5.3%
Stone Mining and Quarrying	212310	85.7%	14.3%	0.0%	0.0%	0.0%
Sand, Clay, & Refractory Mineral Mining	212320	84.2%	5.3%	0.0%	5.3%	5.3%
Food production	311100	87.3%	6.7%	4.7%	0.7%	0.6%
Digital Printing	323115	96.6%	3.4%	4.2%	1.3%	1.4%
Petroleum refineries	324110	0.0%	0.0%	0.0%	0.0%	100.0%
Conocophillips Carbon Plant	324199	0.0%	100.0%	0.0%	0.0%	0.0%
Glass container manufacturing	327213	0.0%	0.0%	0.0%	100.0%	0.0%
Foundries	331500	81.3%	6.3%	6.3%	3.1%	3.1%
Heating Equip (except warm air furnaces) manufacturing	333414	82.8%	6.9%	10.3%	0.0%	0.0%
Air Conditioning and Warm Air Heating Equipment	333415	82.8%	6.9%	10.3%	0.0%	0.0%
Industrial process furnace and oven manufacturing	311-32-332/336	96.4%	1.8%	1.8%	0.0%	0.0%
Hazardous Waste Treatment and Disposal	562211	97.1%	1.8%	0.9%	0.2%	0.1%
Materials Recovery	562920	57.9%	31.6%	10.5%	0.0%	0.0%
Cement manufacturing (1 firm)		0.0%	0.0%	100.0%	0.0%	0.0%

Source: ADE, Inc.

HOUSEHOLD IMPACT ANALYSIS (SSM 3, SSM 11, AND SSM 12 ONLY)

A number of the proposed stationary source measures affect households, not simply particular industries. These are SSM 3 (“livestock waste”), SSM 11 (“residential fan type furnace”) and SSM 12 (“large residential and commercial space heating”). Stationary Source Measure 3 primarily affects Bay Area dairies, which, as the table below shows, will be able to pass costs to consumers. The Air District estimates annual costs stemming from SSM 3 at \$1.2 million. Since dairies in the Bay Area typically produce 9.2 million hundred weight pounds (Cwt) of milk, the \$1.2 million cost amounts to \$0.13 per one-hundred pounds of milk, which equals approximately \$0.01 per gallon. As milk is generally selling for \$2.69 a gallon, the addition of \$0.01 will not significantly impact consumers in the Bay Area.

TABLE 25
SSM 3 (“LIVESTOCK WASTE”) IMPACTS ON SAN FRANCISCO
BAY AREA DAIRY INDUSTRY

Annual Compliance Cost: SSM 3	\$1,200,000
Average Annual Milk Production	9,232,412 Cwt
Cost Per Unit (Cwt)	\$0.13
Cost per gallon of milk	\$0.01
Current price of a gallon of milk	\$2.69

Source: ADE, Inc., based on California Agricultural Commissioners’ Annual Reports

SSMs 11 and 12 affect households and owners of large rental buildings. In particular, at the point in time households or property owners seek to replace equipment subject to either SSM 11 or SSM 12, they will have to purchase equipment that complies with the provisions of these control measures, if adopted. Impacts stemming from either SSM 11 or SSM 12 amount to the difference between the original cost and the higher cost of equipment that would comply with tighter emission limits.

Tables 26 and 27 shows that households living in owner-occupied and renter-occupied homes will not be significantly impacted by SSM 11 or SSM 12, as the incremental cost is small fraction of their overall consumer spending, or even spending on household furnishings and household equipment.

**TABLE 26
HOUSEHOLD IMPACT OF PROPOSED STATIONARY SOURCE MEASURE 11**

	SSM 11 (Residential Fan Type Furnace: Incremental Annual Cost As Percent of Annual Retail and Select Service Spending)				SSM 11 (Residential Fan Type Furnace: Incremental Annual Cost As Percent of Annual Household Furnishing and Equipment Spending)			
	All Households	Owner-Occupied w/Mortgage	Owner-Occupied w/o Mortgage	Renter-Occupied	All Households	Owner-Occupied w/Mortgage	Owner-Occupied w/o Mortgage	Renter-Occupied
Total	0.2%	0.1%	0.2%		2.3%	2.0%	2.8%	3.9%
Owner-Occupied building type:								
Single, detached or attached	0.2%	0.1%	0.2%	N/A	2.0%	2.0%	2.8%	N/A
Multi-family	0.2%	0.2%	0.2%	N/A	2.3%	2.3%	3.2%	N/A
Renter-Occupied building type:								
Single, detached or attached	0.2%	N/A	N/A	0.2%	2.8%	N/A	N/A	2.8%
Multi-family	0.3%	N/A	N/A	0.3%	3.9%	N/A	N/A	3.9%

Source: ADE, Inc., based on BAAQMD, US Census, and US BLS

**TABLE 27
HOUSEHOLD IMPACT OF PROPOSED STATIONARY SOURCE MEASURE 12**

	SSM 12 (Large Residential and Commercial Space Heating: Incremental Annual Cost As Percent of Annual Retail and Select Service Spending)				SSM 12 (Large Residential and Commercial Space Heating: Incremental Annual Cost As Percent of Annual Household Furnishing and Equipment Spending)			
	All Households	Owner-Occupied w/Mortgage	Owner-Occupied w/o Mortgage	Renter-Occupied	All Households	Owner-Occupied w/Mortgage	Owner-Occupied w/o Mortgage	Renter-Occupied
Total Multi-family units	0.3%	0.3%	0.3%	0.4%	4.6%	3.6%	5.1%	5.1%
Owner-Occupied	0.3%	0.3%	0.3%	N/A	4.1%	3.6%	5.1%	N/A
Renter-Occupied	0.4%	N/A	N/A	0.4%	5.1%	N/A	N/A	5.1%

Source: ADE, Inc. , based on BAAQMD, US Census, and US BLS

ANALYSIS OF IMPACTED COMMUNITIES

For more than twenty years, the Air District has implemented programs that are designed to identify and reduce the public's exposure to toxic air contaminants (TACs). In 2004, the District initiated the Community Air Risk Evaluation (CARE) program, which focuses on assessing air pollution health impacts for specific Bay Area priority communities (or "impacted communities") which have been identified as areas that bear a disproportionate share of population exposure to air pollution. The CARE program takes a broader look at air pollution health impacts than the District's other air toxics programs by including both stationary and mobile sources of air pollution in the health impacts analysis, and by evaluating the cumulative health impacts that arise from multiple causes of air pollution in any one of the six impacted communities. The District is pursuing multiple mitigation measures (e.g. grants, incentives, land use guidance, rules, and regulations) to reduce health impacts related to air pollution in these priority communities. Among other things, the District is seeking to prevent significant increases in health risks resulting from new and modified sources of TACs based on preconstruction permit review, by requiring updated control requirements when older, more highly polluting, sources are modified or replaced. Thus, industries in the impacted communities could potentially bear more costs relative to those outside of these areas if more stringent requirements were imposed on businesses in these communities, although whether this will occur will be determined as more information and details emerge through the rule development process. In analyzing control measures in the CAP, no additional compliance costs have been identified for industries located in priority communities. It should also be noted that these communities, and businesses located therein, may benefit as recipients of funding through the Air District's grant programs, based upon District policy to prioritize grants for projects in these communities.

Table 28 below compares the economic profile of the six impacted communities against the larger Bay Area. The analysis in the table below is based on ZIP Codes, data for which comes from the US Census. It is important to note that ZIP Code boundaries do not seamlessly coincide with boundaries of their respective impacted communities. As a result, a number of workers included in Table 28 could actually be working outside of the impacted communities, all the while working within the ZIP Code. Thus, although the data below comes from the best available source, the indicated proportions may actually overstate the case. Of the 2,727,989 private sector jobs, 1,099,335 are with establishments located in six impacted communities ZIP Codes, or 40 percent. Fifty-eight percent of financial activities positions are in these areas, most likely because the downtown of San Francisco, Oakland, and San Jose are located in these communities. At 47 percent, almost half of all manufacturing establishments are located in these areas, underscoring the disproportionate amount of industrial activity occurring in these communities, which constitute significantly less than half of the urbanized area of the nine-county San Francisco Bay Area.

**TABLE 28
COMPARISON OF SF BAY AREA AND IMPACTED COMMUNITIES INDUSTRY PROFILES**

Industry	SF Bay Area		Impacted Communities		Comparison	
	Estab.	Employment	Estab.	Employment	Estab.	Employment
<i>Private Sector Industries</i>	238,314	2,727,989	70,608	1,099,335	29.6%	40.3%
Goods-Producing	23,114	503,436	8,490	169,327	36.7%	33.6%
Natural Resources and Mining	1,112	16,120	45	1,660	4.0%	10.3%
Construction	14,238	165,536	4,778	70,863	33.6%	42.8%
Manufacturing	7,764	321,780	3,667	96,805	47.2%	30.1%
Service-Providing	215,213	2,224,553	62,118	930,008	28.9%	41.8%
Trade, Transportation, and Utilities	30,840	526,559	14,262	205,888	46.2%	39.1%
Information	3,477	112,028	2,041	51,222	58.7%	45.7%
Financial Activities	18,775	186,333	8,521	108,816	45.4%	58.4%
Professional and Business Services	36,804	567,658	15,852	255,650	43.1%	45.0%
Education and Health Services	19,855	358,359	7,860	128,953	39.6%	36.0%
Leisure and Hospitality	16,886	314,110	7,467	130,014	44.2%	41.4%
Other Services	88,576	159,506	6,115	49,465	6.9%	31.0%

Source: ADE, Inc. , based on US Census

Table 29 identifies the extent to which industries potentially affected by stationary source control measures are located in the impacted communities. In the Bay Area, there are 36 foundries (NAICS 3315) and 1,323 fabricated metal product manufacturing plants (NAICS 332). Of these 62 percent and 55 percent respectively are located in the impacted communities, as are 50 percent and 47 percent of the digital printing (NAICS 323115) and solid waste collection industries (NAICS 562212). All this underscores the disproportionate extent to which certain heavy industries are located in the impacted communities, relative to the rest of the Bay Area.

TABLE 29
COMPARISON OF SF BAY AREA AND IMPACTED COMMUNITIES INDUSTRIES SUBJECT
TO STATIONARY SOURCE MEASURES

Proposed CAP Control Measures	NAICS	SFBA	Impacted communities	Concentration
<i>Private Sector Industries</i>				
Crop Production	111	1,027		
Animal Production	112	261		
Natural Gas Liquid Extraction	211112	2		
Stone Mining And Quarrying	21231	9	1	11%
Sand, Clay, & Refractory Mineral Mining	21232	16	5	31%
Construction	23	14,238	4,778	34%
Manufacturing	31-33	7,764	3,667	47%
Food Production	3111	16	3	19%
Digital Printing	323115	62	31	50%
Petroleum Refineries	32411	5	1	23%
ConocoPhillips Carbon Plant	324199	1	0	0%
Fertilizer (Mixing Only) Manufacturing	325314	6		
Cement & Concrete Product Manufacturing	3273	122	33	27%
Lehigh Southwest Cement (Plant #17)	327310	1	0	0%
Glass Container Manufacturing	327213	5	1	20%
Foundries	3315	36	22	62%
Fabricated Metal Product Manufacturing	332	1,323	728	55%
Machinery Manufacturing	333	500	179	36%
Materials Recovery Facilities	562920	3		
Hazardous Waste Treatment And Disposal	562211	32	9	28%

Source: ADE, Inc., based on US Census

4.3 MOBILE SOURCE MEASURES

The 2010 CAP includes a number of mobile source measures (MSMs) that will be implemented primarily by means of voluntary partnerships with public and private fleets, by providing grants and incentives to offset the incremental cost of cleaner vehicles, and by offering incentives to accelerate the retirement or replacement of high-emitting vehicles and equipment. Entities that participate in implementing the MSMs would do so on a voluntary basis. The MSMs would not be regulatory in nature, nor would they impose any “unfunded mandate.” With respect to analyzing the socioeconomic impacts of the various MSMs, impacts stemming from these measures are covered in the regional impact analysis, largely because the MSM represent an infusion of dollars into the regional economy.

4.4 TRANSPORTATION CONTROL MEASURES

Similar to the mobile source measures, the transportation control measures (TCMS) are not regulatory in nature. For the most part, the TCMs will not impose discrete costs on household, private sector and public sector stakeholders. The TCMs will be implemented by a variety of means including partnerships, public education, grants and incentives, and allocation of funding for capital or operating costs by the Metropolitan Transportation Commission (MTC), the Air District, or partner agencies. The TCM descriptions identify the estimated amount of funds that will be available to implement the various measures. However, the extent to which the TCMs are implemented will depend, in many cases, upon the availability of funding based upon future programming decisions. Measures may be

scaled back if available funding is less than anticipated. The bulk of the costs identified represent either transfers from MTC to local, regional, and state transportation agencies, or expenditures on the part of MTC to achieve certain objectives with respect to improving transit in the region. Table 30 below identifies MTC programs listed under various transportation control measures of the 2010 CAP. The MTC is already implementing a number of these to some degree. The annual program costs for the TCMs identified below amount to \$453.1 million. The amount of funds that the MTC allocates to achieve the objectives of any one of the proposed TCMs may vary from year to year depending on programming decisions made by MTC's governing board. MTC programming decisions are summarized in the Transportation Improvement Program (TIP).⁸ MTC prepares and adopts the TIP every two years. By law, the TIP must cover at least a four-year period and contain a priority list of projects grouped by year. The 2009 TIP contains approximately 1066 projects totaling about 12.8 billion dollars (\$12.8 billion). The TIP is also financially constrained – meaning that the amount of funding programmed does not exceed the amount of funding reasonably expected to be available. Based on the mix of funding sources that comprise MTC's budget, it is anticipated that nearly 80 percent of the TCM costs will be funded by state and federal funds.

TABLE 30
TRANSPORTATION CONTROL MEASURES: ESTIMATED IMPLEMENTATION COSTS

		Annual Program Costs
<i>Transportation Control Measures: Impacts Covered By Agency Funds</i>		
TCM A-1	Improve Local & Area-Wide Bus Service	\$340,433,333
TCM B-1	Implement Freeway Performance Initiative	\$51,666,667
TCM B-2	Improve Transit Efficiency and Use	\$25,667,000
TCM C-1	Voluntary Employer Trip Reduction Program	\$3,600,000
TCM C-2	Safe Routes to School and Transit	\$13,333,000
TCM C-3	Promote Rideshare Services	\$5,666,667
TCM C-4	Public Outreach and Education	\$4,333,333
TCM C-5	Public Outreach and Education for Smart Driving/Speed Moderation	\$1,000,000
TCM D-1	Improve Bicycle Access and Facilities	\$1,500,000
TCM D-2	Improve Pedestrian Access and Facilities	\$40,000
TCM D-3	Support Local Land Use Strategies	\$5,866,667
		\$453,106,667

Source: ADE, Inc., based on BAAQMD

In addition to the measures identified in Table 30, there are also a number of the transportation control measures that could potentially impact certain entities, from commuters utilizing regional highways and bridges, good-moving industries, and local and county governments. Table 31 below identifies transportation control measures that will potentially affect the private sector and households.

⁸ See: www.mtc.ca.gov/funding/tip/

It is anticipated that TCM B-3 (Bay Area express lane network) will be funded primarily by user fees on single-occupant vehicles that chose to pay for the use of the high-occupancy vehicle lanes. Payment of such a fee would be strictly at the discretion of each solo driver.

TABLE 31
ENTITIES AFFECTED BY PROPOSED TRANSPORTATION CONTROL MEASURES (TCM A-2, B-3, B-4, E-1 AND E-3)

Transportation Control Measures		Annual Program Costs	Potential Impacted Entities	Impacted Units
TCM B-3	Bay Area Express Lane Network	\$108,000,000	Highway commuters	2,390,923
TCM B-4	Goods Movement Improvements & ER Strategies	\$40,000,000	Commercial truck operators and/or households	17,292
TCM E-1	Value Pricing Strategies	\$26,000,000	Drivers who cross bridges during weekday peak periods	75,875,881
TCM E-3	Implement Transportation Pricing Reform	\$471,143,000	Vehicle operators	2,450,790
			Operators of vehicles in commercial fleets (est.)	24,332
			Commercial truck operators (est.)	17,292

Source: ADE, Inc., based on BAAQMD, US Census, and MTC

The table above shows costs related to TCM B-3 (express lanes), TCM B-4 (goods movement), TCM E-1 (value pricing), and TCM E-3 (transportation pricing reforms). Both BAAQMD and the MTC will seek federal, state, and other sources of funds to cover the costs of TCM B-3, B-4, E-1, and E-3. In the event funds are not available, the table above identifies sources that might be called upon to cover any shortfall in funds per TCM. It is likely, however, that the sources identified in the table above may not have to absorb costs, as MTC and/or the Air District may limit the scope of these TCM to amount of available funds. The precise manner in which TCMs B-3, B-4, E-1, and E-3 affect sources in the Bay Area will become more clear as these agencies move forward to implement the measures.

TCM E-2 would encourage local governments to consider revising parking policies and using pricing mechanisms to better align parking demand with parking supply. For purposes of analyzing the emission reduction potential of this measure, Air District staff relied on available estimates as to how much the imposition of parking fees at Bay Area worksites would reduce vehicle trips and emissions. It should be emphasized that neither BAAQMD nor MTC is proposing to require worksite parking fees as part of TCM E-2. However, for analytical purposes only, if such a fee were implemented at all worksites on a District-wide basis, this would result in an annual cost of up to \$1.48 billion, which would be borne by employees who continue to park in employer-provided parking in the region. The \$1.48 billion estimate is based on a \$3.18 employee daily parking fee.⁹ On average, private sector employees in the nine-county Bay Area gross \$1,300 in weekly pay (i.e. not including benefits), whereas public sector employees gross \$1,200 on average per week.¹⁰ At \$3.18 per day, the average private sector or public sector employee who drives to work and uses employer-provided parking would pay \$15.90 per week, or approximately one-percent of her or his respective weekly gross paycheck. It is important to emphasize that TCM E-2 does not require actual expenditures on the part of local governments, employers, or employees. In any event, a hypothetical \$3.18 employee daily parking fee would not appear to pose a significant impact on Bay Area employees. Employees could reduce exposure to, if not altogether avoid, a fee through a variety of strategies, including ride-sharing with co-workers, or by using alternative modes such as transit, bicycling, walking, or telecommuting. It is possible that costs associated with implementing this rule might also represent a benefit to public transit agencies in the region, as fees collected via TCM E-2 could be re-directed to alternative forms of mass transit. The precise manner in which TCM E-2 affects sources in the Bay Area will become clearer as regional and local agencies move forward to implement this measure.

⁹ The \$3.18 per day parking fee is derived from earlier study (Deakin & Harvey, 1997) of the impact of a \$2.00 per day parking fee; the \$2.00 fee equals \$3.18 in 2009 dollars.

¹⁰ ADE, Inc., based on California EDD LMID QCEW database

TABLE 32
IMPACT ANALYSIS OF PROPOSED TRANSPORTATION CONTROL MEASURE TCM E-2

Aggregate Annual Cost: TCM E-2	\$1,478,171,150
Daily Parking Fee on which \$1,478,171,150 is predicated	\$3.18
\$3.15 Daily Fee Expressed As Weekly Amount	\$15.90
Average Weekly Gross Pay: Private Sector	\$1,300
Average Weekly Gross Pay: Public Sector	\$1,200
Weekly Fee as Percent Average Weekly Gross Pay: Private Sector	1.2%
Weekly Fee as Percent Average Weekly Gross Pay: Public Sector	1.3%

Source: ADE, Inc., based on BAAQMD and California EDD-LMID QCEW database

4.5 ENERGY AND CLIMATE MEASURES

There are four energy and climate measures and, of the four, two would provide economic benefits to businesses and households in the region. These are ECM-1 (energy efficiency) and ECM-3 (urban heat island). ECM-2 pertains to renewable energy, particularly with respect to new residential and/or commercial-industrial development. ECM-4 would promote urban tree-planting.

When ECM-1 is fully implemented, affected entities could potentially save \$20.1 million a year due to more efficient use of energy at work and in the home. These same entities could also benefit by \$39.6 million per year by implementing the cool-roofing and cool-paving elements of ECM-3. Table 33 distributes ECM-1 and ECM-3 savings across industries and households. Distribution is based on per capita energy consumption by specific industries and households (see Appendix F). The household analysis factored in tenure, type of unit, and income by combining home energy consumption data from the US BLS and household characteristics data from the US Census.

TABLE 33
SOURCES POTENTIALLY IMPACTED BY PROPOSED ENERGY AND CLIMATE MEASURES ECM-1
(ENERGY EFFICIENCY) AND ECM-3 (URBAN HEAT ISLAND MITIGATION)

	Number of Affected Sources	Distribution of ECM-1 Savings	Distribution of ECM-3 Savings	Total Savings
All		(\$20,086,000)	(\$39,640,000)	(\$59,726,000)
Private and Public Sectors Establishments	243,187	(\$10,440,427)	(\$20,604,314)	(\$31,044,741)
SF Bay Area Region Households	2,453,626	(\$9,645,573)	(\$19,035,686)	(\$28,681,259)
Private and Public Sectors Establishments	243,187	(\$10,440,427)	(\$20,604,314)	(\$31,044,741)
Total, all industries (private ownership):	238,327	(\$9,241,907)	(\$18,239,013)	(\$27,480,920)
Goods-Producing	23,114	(\$5,073,517)	(\$10,012,665)	(\$15,086,182)
Natural Resources and Mining	1,112	(\$165,879)	(\$327,392)	(\$493,271)
Construction	14,238	(\$670,694)	(\$1,323,613)	(\$1,994,307)
Manufacturing	7,764	(\$4,236,944)	(\$8,361,660)	(\$12,598,604)
Service-Providing	215,213	(\$4,168,390)	(\$8,226,347)	(\$12,394,737)
Trade, Transportation, and Utilities	30,840	(\$1,373,002)	(\$2,709,645)	(\$4,082,647)
Information	3,477	(\$319,032)	(\$629,606)	(\$948,638)
Financial Activities	18,775	(\$204,203)	(\$402,995)	(\$607,198)
Professional and Business Services	36,804	(\$488,451)	(\$963,971)	(\$1,452,422)
Education and Health Services	19,855	(\$551,784)	(\$1,088,940)	(\$1,640,724)
Leisure and Hospitality	16,886	(\$935,357)	(\$1,845,928)	(\$2,781,285)
Other Services	79,983	(\$275,881)	(\$544,454)	(\$820,335)
Unclassified	8,593	(\$20,680)	(\$40,808)	(\$61,488)
Government Ownership:	4,860	(\$1,198,520)	(\$2,365,302)	(\$3,563,822)
Federal Government	546	(\$142,301)	(\$280,835)	(\$423,136)
State Government	1,585	(\$233,903)	(\$461,614)	(\$695,517)
Local Government	2,729	(\$822,316)	(\$1,622,853)	(\$2,445,169)
Households	2,453,626	(\$9,645,573)	(\$19,035,686)	(\$28,681,259)
Households in owner-occupied units	1,441,328	(\$6,548,105)	(\$12,922,784)	(\$19,470,889)
Households in renter-occupied units	1,012,298	(\$3,097,468)	(\$6,112,901)	(\$9,210,369)

Source: ADE, Inc., based on BAAQMD, US BLS/CA EDD, US Census and US BLS

The renewable energy control measure (ECM-2) would promote the installation of solar energy and other forms of renewable energy. While the cost associated with this measure is estimated \$11.4 million a year, it is important to note that ECM-2 is not regulatory in nature, meaning that implementation of this measure is either predicated on availability of incentive dollars or voluntary. In other words, ECM-2 would not impose any mandatory cost on developers or other entities. As Table 34 shows, over the seven-year period from 2000 to 2007, the Bay Area experienced, on average, \$14.0 billion of new residential and non-residential development. These projects generated an estimated \$1.3 billion in net profits to project proponents. Measured against the net profits, annual costs stemming from ECM-2 amount to 0.9 percent of net profits, meaning that affected stakeholders would not be significantly impacted by ECM-2.

**TABLE 34
IMPACT ANALYSIS OF ENERGY AND CLIMATE MEASURE ECM-2 (RENEWABLE ENERGY)**

San Francisco Bay Area Construction Activity	Average Annual Valuation	Net Profit	Annual Cost of ECM-2	Cost as Percent of Net Profits
Residential Permits	\$7,814,405,321	\$781,440,532		
Non-Residential Permits	\$6,228,998,672	\$498,319,894		
	\$14,043,403,993	\$1,279,760,426	\$11,392,000	0.89%

Source: ADE, Inc. , based California Statistical Abstract, BAAQMD, and US IRS (note: while costs associated with ECM-2 are estimated at \$11.4 million a year, ECM-2 is not regulatory in nature, meaning that implementation is predicated either on availability of incentive dollars or is voluntary.

Table 35 below shows that local governments would not be significantly affected by cost stemming from ECM-4, the tree planting measure.

**TABLE 35
IMPACT ANALYSIS OF PROPOSED ENERGY AND CLIMATE MEASURE E-4 (TREE PLANTING)**

	Estab.	Employment	Annual General Fund Expenditures	Annual Redevelopment Expenditures	Annual Cost ECM-4	Annual Cost Per Local Revenue Sources
Local and County Gov't	125	23,177	\$14,531,429,454	\$1,897,139,160	\$71,049,000	0.4%

Source: ADE, Inc. , based on BAAQMD, US Census, and California Controller

SMALL BUSINESS IMPACTS

Measure ECM-2 (promoting renewable forms of energy) will affect a number of residential and non-residential developers and the construction industries. However, as indicated earlier, ECM-2 is a voluntary measure that does not require affected businesses to install fuel-efficient units when building new residential or non-residential projects. Table 36 shows that the bulk of construction businesses in the Bay Area employ less than 50 workers. To the extent that ECM-2 is successful in increasing demand for solar or other forms of renewable energy, small construction businesses that install renewable energy systems may benefit from increased business.

**TABLE 36
EMPLOYMENT SIZE DISTRIBUTION OF INDUSTRIES POTENTIALLY IMPACTED BY ECM E-2**

	NAICS	1 - 49	50 - 99	100 - 249	250 - 499	>500
Construction of Residential/Non-residential Buildings	236	97.5%	1.3%	0.9%	0.1%	0.1%

Source: ADE, Inc. based on US Census

4.6 LAND USE & LOCAL IMPACT MEASURES

Table 22 above identifies annual costs for the land use and local impact measures that address goods movement (LUM-1) and a potential indirect source review (ISR) regulation (LUM-2). The District is continuing to analyze potential costs associated with the remaining land use measures.

Table 37 shows that, at 1.1 percent of net profits, impacts stemming from LUM-1 are significantly below the threshold employed to determine whether affected industries would be significantly impacted. However, it is important to remember that the freight truck operators are, in effect, delivering goods valued at \$333 billion.¹¹ In this context, assuming a four percent profit rate on these goods, then the costs associated with LUM-1 amount to 0.10 percent of net profits anticipated from the sale of these goods.¹² It is likely, therefore, that the trucking industry would be able to pass on the costs of LUM-1 to their customers, reducing the possibility that LUM-1 would result in significant impacts.

TABLE 37
IMPACT ANALYSIS FOR INDUSTRIES POTENTIALLY IMPACTED BY PROPOSED LAND USE MEASURES
(DOLLARS IN \$ MILLIONS)

	Estab.	Employment	Payroll	Revenues	Net Profits	Annual Costs	Annual Cost as Percent of Net Profits
LUM-1 Goods Movement	73	455	\$31	\$5,197	\$134	\$1,449,000	
General Freight Trucking	8,220	24,479	\$31	\$5,197	\$134	\$1,449,000	1.1%
LUM-2 Indirect Source Rule	4,148	42,059	\$2,829	\$14,657	\$1,328	\$1,412,000	0.1%
New Single-Family Housing Construction	2,769	16,292	\$910	\$3,770	\$377	\$546,959	0.1%
New Multifamily Housing Construction	579	8,381	\$397	\$3,978	\$398	\$281,360	0.1%
Nonresidential Building Construction	800	17,386	\$1,522	\$6,909	\$553	\$583,681	0.1%

Source: ADE, Inc., based on BAAQMD, US Census, US IRS, and US BLS/CA EDD

An ISR regulation as described in LUM-2 would require development projects above a given threshold to implement measures to reduce emissions from motor vehicle trips or area sources, such as fireplaces and heating and cooling equipment, associated with the project. The specific requirements and provision of an ISR regulation will be determined through the District's rule development process. The table above shows that impacts to industries subject to LUM-2 are expected to be less than significant. However, further analysis of compliance costs will be performed during the rule development process for this measure.

¹¹ Cambridge Systematics, "Regional Goods Movement Study for the SF Bay Area: Data Reconnaissance and Trends Final Report (Task 2)"(2003)page ES-21.

¹² 0.10 percent = \$13.3 million / (\$333 billion * .04)

SMALL BUSINESS IMPACT ANALYSIS

The Indirect Source Review (ISR) Regulation (LUM-2) will affect a number of residential and non-residential developers and construction industries. More detail via the formal rule development process will emerge as to how the ISR will affect small businesses. As indicated earlier in Table 36, the bulk of businesses in construction are small businesses.

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5. REGIONAL IMPACT ANALYSIS

In addition to the direct impacts stemming from the proposed control measures in terms of costs absorbed by affected industries, the 2010 CAP is expected to indirectly affect other industries in the nine-county region. This occurs because establishments engaged in buyer-supplier relations with industries directly affected by the proposed control measure may lose contracts and sales as customers/industries directly affected by the measures reduce their respective expenditures. Conversely, the positive effects of the CAP measures have economic benefits that help to offset the negative impacts. This section presents findings with respect to indirect impacts stemming from the proposed measures. First, we review our impact analysis methodology. Then, we present our overall findings. After this, we discuss direct and indirect impacts by broad control measure categories.

METHODOLOGY

To estimate the cumulative jobs multiplier effects resulting from the proposed control measures, ADE used the IMPLAN input-output model. This model can estimate economic impacts resulting from changes in business output, employment, income, and value added. In this case, all of the multiplier effects derive from cost data that was provided by the District.

The application used to interpret the data and generate the impact calculations is IMPLAN Impro Professional 2.0. This application calculates impacts and buyer-supplier relationships for 440 individual industry and commodity categories. The industry classification system used in the IMPLAN model roughly approximates, but still differs significantly from the commonly used Standard Industry Classification (SIC) and North American Industry Classification System (NAICS). The input-output matrices that form the main database come from the 2007 Bureau of Economic Analysis (BEA) dataset, and the analysis used an individual county-specific dataset for San Francisco Bay Area. The calculations in the analysis use the default data in the IMPLAN dataset, and did not include any modifications to the default model assumptions.

The economic impacts estimated by the model fall into one of three categories -- direct, indirect, and induced. These impacts are calculated on the basis of annual impacts. In this analysis, direct impacts represent the estimated jobs, labor income, and industry output that result directly from costs or savings stemming from the proposed control measures. Indirect impacts represent the estimated effects that result from demand for commodities and services provided by suppliers. Examples of supplier industries include business services, industrial machinery, and other equipment. Induced impacts represent the potential effects resulting from household spending at local businesses by the workers. These impacts generally affect retail businesses, health services, and personal services providers.

OVERALL REGIONAL IMPACT FINDINGS

Table 38 below shows the estimated direct impacts, indirect impacts, induced impacts, and total impacts for the 2010 CAP control measures as whole. The table shows economic benefits (Control Benefits), economic costs (Control Costs), and net control impacts.

In terms of direct effects, the control measures are expected to provide an annual \$3.3 billion benefit to the region due to new construction and other activities, and improved health resulting from cleaner air. Of the \$3.3 billion in benefits, \$1 billion is attributable to construction and other activities and \$641 million in economic benefit stems from improved air quality. Direct costs impacts are estimated at \$1.065 billion per year, as discussed below. Thus, on a net basis, the control measures are expected to benefit the region by \$2.25 billion per year.

The table below also includes the net effects, including indirect impacts and induced impacts, of the proposed control measures under 2010 CAP. The measures directly benefit the region in the amount of \$2.2 billion in industry output, which translates into 21,200 net new jobs. The \$2.2 billion in net direct impact generates \$575.1 million in indirect economic activity due to buyer-supplier relations with industries directly affected by the control. These indirect impacts, in turn, could increase the number of jobs by 3,100 workers. The direct and indirect effects would generate a net increase of another 7,200 jobs, as new workers in industries directly and indirectly affected by the control measures purchase goods and services from local retailers and service-providers. The net impact of the proposed control measures is an increase of 31,500 jobs to the region.

While total annual costs stemming from the proposed control measures amounts to \$3.97 billion, a portion of the costs are expected to be covered by federal and state funds. Moreover, a portion of the \$3.97 billion is also for construction-related activities that, for purposes of the multiplier impact analysis, are treated as benefits to the region, not costs. For these reasons, the actual direct regional cost stemming from the proposed control measures is \$1.065 billion a year.

It is important to note that any direct impact job losses noted in the table below represent a worse case scenario in which affected industries are not able to absorb costs stemming from the proposals. However, the analysis shows that for those control measures where cost information is available, impacts are less than significant across the board, based on the criteria for significance discussed in the Methodology Chapter above. Thus, in the worse case, an impact of \$1.065 billion translates to the potential direct loss of about 5,300 jobs across a number of industries. The \$1.065 billion in direct cost results in a loss of another \$407.9 million by other establishments with which businesses directly affected by the control measures engage in buyer-supplier relations. Establishments indirectly affected by the control measures, in turn, decrease employment by 1,700 jobs, in the worse case scenario. The direct and indirect job losses, in turn, induce the loss of another 2,900 jobs. The induced impacts result from reduced retail and services expenditures by workers in their respective communities.

TABLE 38
SUMMARY OF MULTIPLIER IMPACTS FROM ALL CONTROLS
(DOLLARS IN \$ MILLIONS)

Control Benefits	Direct Impacts	Indirect Impacts	Induced Impacts	Total Impacts
Industry Output	\$3,318.1	\$982.9	\$1,612.7	\$5,913.8
Employment	26,500	4,800	10,100	41,400
Labor Income	\$1,730.1	\$370.2	\$559.0	\$2,659.3
Control Costs	Direct Impacts	Indirect Impacts	Induced Impacts	Total Impacts
Industry Output	(\$1,065.1)	(\$407.9)	(\$487.1)	(\$1,960.1)
Employment	(5,300)	(1,700)	(2,900)	(9,900)
Labor Income	(\$401.9)	(\$141.4)	(\$172.3)	(\$715.7)
Net Control Impacts	Direct Impacts	Indirect Impacts	Induced Impacts	Total Impacts
Industry Output	\$2,253.0	\$575.1	\$1,125.7	\$3,953.7
Employment	21,200	3,100	7,200	31,500
Labor Income	\$1,328.1	\$228.7	\$386.7	\$1,943.5

Source: ADE Inc., data from IMPLAN input-output model

CONTROL MEASURE IMPACT ANALYSIS

The Air District is proposing 18 stationary source measures in the 2010 CAP. The overall impact of these measures is summarized in Table 39. Of the 18 measures, the District has provided preliminary cost estimates for eight control measures, totaling \$44.8 million per year. It is important to note that two measures affect households in the amount of \$11.8 million a year, with the balance of \$35.6 million falling on industries in the nine-county region. In addition to costs from the proposed SSMs, these measures also generate health benefits directly valued at \$147.5 million a year. For purposes of the regional impact analysis, we only analyze health benefits for those control measures that also have known costs, so as to not overstate the benefits-to-cost analysis. Of the \$147.5 million in health benefits, \$75.4 million are in control measures with known costs. It is important to note that any direct impact job losses noted in the table below represent a worse case scenario in which affected industries are not able to absorb costs stemming from the proposals.

However, the analysis shows that for those stationary source measures where cost information is available, impacts are less than significant across the board. Taking into account costs and benefits, on balance, the SSM will generate \$30.6 million in net direct benefits, which will stimulate \$22.3 million in net indirect economic activity, and another \$30.1 million in induced economic activity, resulting in an overall net increase of 600 jobs.

TABLE 39
SUMMARY OF MULTIPLIER IMPACTS FROM STATIONARY SOURCE CONTROLS
(DOLLARS IN \$ MILLIONS)

Stationary Source Control Health Benefits	Direct Impacts	Indirect Impacts	Induced Impacts	Total Impacts
Industry Output	\$75.4	\$33.7	\$36.9	\$146.0
Employment	400	100	200	700
Labor Income	\$28.0	\$11.7	\$13.1	\$52.8
Stationary Source Control Losses	Direct Impacts	Indirect Impacts	Induced Impacts	Total Impacts
Industry Output	(\$44.8)	(\$11.4)	(\$6.8)	(\$63.0)
Employment	(100)	0	0	(200)
Labor Income	(\$5.4)	(\$3.3)	(\$2.5)	(\$11.2)
Net Stationary Source Control Impacts	Direct Impacts	Indirect Impacts	Induced Impacts	Total Impacts
Industry Output	\$30.6	\$22.3	\$30.1	\$83.0
Employment	300	100	200	600
Labor Income	\$22.6	\$8.4	\$10.6	\$41.6

Source: ADE Inc., data from IMPLAN input-output model

The overall impacts of the ten mobile source measures in the 2010 CAP are summarized in Table 40. The MSMs are expected to provide economic benefits in the form of grants and incentives of \$108.2 million per year, along with \$64.6 million per year in health benefits. These measures are also estimated to impose \$54.1 million in annual costs, all are considered direct impacts on the region as a whole for purposes of the regional multiplier impact analysis. The resulting net direct benefits total \$118.6 million and 700 positions. The total net benefit amounts to 1,200 jobs, taking into account indirect and induced multiplier effects.

TABLE 40
SUMMARY OF MULTIPLIER IMPACTS FROM MOBILE SOURCE CONTROLS
(DOLLARS IN \$ MILLIONS)

Mobile Source Control Health Benefits	Direct Impacts	Indirect Impacts	Induced Impacts	Total Impacts
Industry Output	\$64.6	\$28.8	\$31.6	\$125.0
Employment	300	100	200	600
Labor Income	\$24.0	\$10.1	\$11.2	\$45.3
Mobile Source Control Incentives	Direct Impacts	Indirect Impacts	Induced Impacts	Total Impacts
Industry Output	\$108.2	\$32.1	\$42.9	\$183.2
Employment	600	200	300	1,100
Labor Income	\$42.4	\$12.6	\$15.7	\$70.6
Mobile Source Control Costs	Direct Impacts	Indirect Impacts	Induced Impacts	Total Impacts
Industry Output	(\$54.1)	(\$24.2)	(\$26.5)	(\$104.8)
Employment	(300)	(100)	(200)	(500)
Labor Income	(\$20.1)	(\$8.4)	(\$9.4)	(\$37.9)
Net Mobile Source Control Impacts	Direct Impacts	Indirect Impacts	Induced Impacts	Total Impacts
Industry Output	\$118.6	\$36.8	\$48.0	\$203.4
Employment	700	200	300	1,200
Labor Income	\$46.2	\$14.2	\$17.5	\$77.9

Source: ADE Inc., data from IMPLAN input-output model

The CAP also includes 17 transportation control measures (TCMs). The TCMs are different from control measures in the other categories. Most TCMs involve the Metropolitan Transportation Commission as the lead agency with respect to funding and coordinating activities. The way in which the impacts flow from lead agency to affected sources and industries also differs from the other control measures. Overall annual costs associated with the TCMs total \$3.75 billion, nearly 80 percent of which would be covered by federal and state funds (\$2.93 billion). The remaining \$821.2 million would be paid from a variety of local funds, which include local taxes as well as fees such as bridge tolls and other direct charges to the public for various air specific programs.

In Table 41, the state/federal portion of these costs are treated as a regional benefit to extent that they would support infrastructure construction activity, local purchase of transit or transportation equipment and operation of programs within the region. Purchase of transit equipment or other items from outside the Bay Area is not treated as a local economic benefit. The use of the funds for services (program operation), equipment purchase, and infrastructure construction are separated in the table because the economic effects on the region, including indirect multipliers, are different for each activity.

The local share of the TCM costs (\$821.2 million) represent both a negative cost impact for the households and businesses and pay the funds, but also a positive economic effect to extent the funds support local jobs and create wages and income. Again, the multiplier effects on the cost side may be different than those on the income side, so they are treated separately in Table 41 below. The benefits of the combined state/federal/local TCM expenditures are shown in the upper part of the table and the cost effects are shown in the lower part. As the table shows, the net direct impact of the various TCMs is a positive \$2.0 billion, and the multiplier effects increase this benefit to \$3.5 billion per year during the term of the plan. The TCMs for which costs are known generate 20,100 direct net jobs, with a total positive impact of 29,100 jobs, taking into account indirect and induced multiplier effects.

TABLE 41
SUMMARY OF MULTIPLIER IMPACTS FROM TRANSPORTATION CONTROLS
(DOLLARS IN \$ MILLIONS)

Transportation Control Health Benefits	Direct Impacts	Indirect Impacts	Induced Impacts	Total Impacts
Industry Output	\$288.9	\$129.0	\$141.6	\$559.5
Employment	1,400	500	800	2,800
Labor Income	\$107.3	\$45.0	\$50.3	\$202.6
Transportation Control Services Benefits (program operation)	Direct Impacts	Indirect Impacts	Induced Impacts	Total Impacts
Industry Output	\$522.2	\$0.0	\$343.2	\$865.4
Employment	8,900	0	2,200	11,100
Labor Income	\$466.2	\$0.0	\$118.0	\$584.2
Transportation Control Equipment Benefits	Direct Impacts	Indirect Impacts	Induced Impacts	Total Impacts
Industry Output	\$146.5	\$55.7	\$40.7	\$242.9
Employment	1,300	200	300	1,800
Labor Income	\$36.9	\$18.4	\$14.0	\$69.3
Transportation Control Construction Benefit	Direct Impacts	Indirect Impacts	Induced Impacts	Total Impacts
Industry Output	\$1,900.2	\$612.0	\$877.8	\$3,390.0
Employment	12,500	3,200	5,500	21,300
Labor Income	\$951.7	\$240.6	\$301.9	\$1,494.2
Transportation Control Services Costs (program operation)	Direct Impacts	Indirect Impacts	Induced Impacts	Total Impacts
Industry Output	(\$143.1)	(\$55.6)	(\$60.8)	(\$259.5)
Employment	(700)	(200)	(400)	(1,300)
Labor Income	(\$46.9)	(\$19.5)	(\$21.6)	(\$87.9)
Transportation Control Equipment Costs	Direct Impacts	Indirect Impacts	Induced Impacts	Total Impacts
Industry Output	(\$275.3)	(\$123.0)	(\$134.9)	(\$533.2)
Employment	(1,400)	(500)	(800)	(2,700)
Labor Income	(\$102.2)	(\$42.9)	(\$47.9)	(\$193.1)
Transportation Control Construction Costs	Direct Impacts	Indirect Impacts	Induced Impacts	Total Impacts
Industry Output	(\$402.8)	(\$179.9)	(\$197.4)	(\$780.2)
Employment	(2,000)	(800)	(1,200)	(4,000)
Labor Income	(\$149.6)	(\$62.8)	(\$70.1)	(\$282.5)
Net Transportation Control Impacts	Direct Impacts	Indirect Impacts	Induced Impacts	Total Impacts
Industry Output	\$2,036.6	\$438.2	\$1,010.0	\$3,484.8
Employment	20,100	2,500	6,500	29,100
Labor Income	\$1,263.3	\$178.9	\$344.6	\$1,786.8

Source: ADE Inc., data from IMPLAN input-output model

The energy and climate control measures are unique in that two (ECM-1 “energy efficiency” and ECM-3 “urban heat island mitigation”) are expected to save money for households and affected industries. Thus, the benefits in Table 42 below include these savings, as well as imputed health benefits stemming from the proposed control measures. It is important to note that households’ savings result in reduced revenues to utilities and certain diesel-related industries. As noted below, direct impacts stemming from all of the ECMs amount to \$142.2 million. On balance, these control measures impact the region by \$46.3 million, reducing 500 jobs on direct, indirect, and induced net bases.

TABLE 42
SUMMARY OF MULTIPLIER IMPACTS FROM ENERGY CLIMATE CONTROLS
(DOLLARS IN \$ MILLIONS)

Energy Climate Control Health and Energy Cost Reduction Benefits	Direct Impacts	Indirect Impacts	Induced Impacts	Total Impacts
Industry Output	\$91.5	\$37.7	\$38.9	\$168.1
Employment	400	200	200	800
Labor Income	\$28.9	\$12.9	\$13.8	\$55.7
Energy Climate Control Losses	Direct Impacts	Indirect Impacts	Induced Impacts	Total Impacts
Industry Output	(\$142.2)	(\$12.7)	(\$59.5)	(\$214.4)
Employment	(800)	(100)	(400)	(1,300)
Labor Income	(\$76.6)	(\$4.1)	(\$20.5)	(\$101.2)
Net Energy Climate Control Impacts	Direct Impacts	Indirect Impacts	Induced Impacts	Total Impacts
Industry Output	(\$50.7)	\$24.9	(\$20.6)	(\$46.3)
Employment	(400)	100	(100)	(500)
Labor Income	(\$47.7)	\$8.8	(\$6.6)	(\$45.6)

Source: ADE Inc., data from IMPLAN input-output model

The Air District has issued preliminary cost estimates for two of the six land use and local impacts measures. The overall impact of these measures is summarized in Table 43. The goods movement measure (LUM-1) and the indirect source review (LUM-2) are estimated to impose \$2.9 million in annual costs. For LUM-2, the estimated costs represent only the costs associated with payment of off-site mitigation fees; the estimate does not include costs that developers may incur to implement on-site mitigations to reduce emissions from new projects subject to an indirect source regulation. These costs are off-set by almost \$121 million in health benefits to the region, resulting in an overall direct impact of \$117.9 million, with about 1,200 net jobs generated on indirect, direct, and induced bases.

TABLE 43
SUMMARY OF MULTIPLIER IMPACTS FROM LAND USE MEASURES
(DOLLARS IN \$ MILLIONS)

Land Use Control Health Benefits	Direct Impacts	Indirect Impacts	Induced Impacts	Total Impacts
Industry Output	\$120.7	\$53.9	\$59.2	\$233.8
Employment	600	200	300	1,200
Labor Income	\$44.8	\$18.8	\$21.0	\$84.6
Land Use Control Losses	Direct Impacts	Indirect Impacts	Induced Impacts	Total Impacts
Industry Output	(\$2.9)	(\$1.1)	(\$1.1)	(\$5.0)
Employment	0	0	0	0
Labor Income	(\$1.1)	(\$0.4)	(\$0.4)	(\$1.9)
Net Land Use Control Impacts	Direct Impacts	Indirect Impacts	Induced Impacts	Total Impacts
Industry Output	\$117.9	\$52.9	\$58.1	\$228.8
Employment	600	200	300	1,200
Labor Income	\$43.7	\$18.4	\$20.6	\$82.8

Source: ADE Inc., data from IMPLAN input-output model

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6. SUMMARY OF IMPACTS BY SECTORS

This chapter describes impacts for each of the three main economic sectors affected by the CAP: businesses/industry, households and local government. The impacts are summarized in Table 44. Impact to small businesses and priority communities as defined by the Air District's CARE program have been addressed in earlier sections of the report and will become more apparent through the more formal rule development process. As discussed earlier in the report, many of the industries and facilities that would be subject to the stationary source measures are located in or near the CARE priority communities.

BUSINESS/INDUSTRY

Businesses in the region would incur direct costs of \$138.0 million per year in compliance costs with the various types of CAP measures. In addition to reduced net income, it is estimated that as many as 669 jobs may be lost as businesses trim labor costs in order to help absorb the compliance costs.

These negative direct effects would be more than offset by the increase in worker productivity from the health benefits of the measures. Reduced health costs and worker absenteeism would increase business output by \$641 million per year, which could stimulate the creation of more than 3,100 new jobs. Therefore, the net effect on the private sector economy on an ongoing annual basis would growth of \$500 million in output and 2,500 jobs. In addition, firms engaged in the construction activity and other equipment production related to implementing the TCMs would see \$2.0 billion per year in sales revenue during the period the plan is implemented, sustaining more than 13,800 jobs.

HOUSEHOLDS

In addition to direct business costs, households in the region would pay out \$856 million annually for implementation of the CAP. Some of this would be direct charges related to specific CAP measures, but most of it would be in the form of taxes and fees that support regional transportation and air quality planning efforts, primarily related to implementation of the TCMs. The reduction in household income due to these expenditures would affect local spending on retail goods and services and other items. It is estimated this reduced income could result more than 4,100 fewer jobs in these local serving kinds of businesses.

Although Table 44 does not list any benefits for households, in reality the health benefits of the CAP measures would be shared by business and households, in the sense that higher worker productivity would result not only in higher business revenues but increase labor income as well. Therefore, the 3,100 new jobs stimulated by the improvements to health would help in part to offset some of the job losses due to reduced retail spending.

LOCAL GOVERNMENT

Local government in this analysis includes not only City and County governments, but also the regional agencies like MTC and the BAAQMD that would administer the programs to implement the CAP. For the most part, the control measures are incentive programs, whereby agencies such as BAAQMD and the MTC receive and, in turn, administer federal and state money to help local and regional governments achieve a variety of objectives with respect to better air quality (see Table 45 for a detailed listing of measures affecting local government). Because the bulk of the control measures listed below are incentive measures, local governments are not required to backfill any shortfall of federal/state funds for any one of the control measures below. In the event insufficient federal/state incentive dollars are available, local governments will not be required to fulfill the objectives of measures for which funding is not available. In other words, the measures below are not “unfunded mandates.”

The Mobile Source and Transportation Control measures in particular would support about \$660 million in local and regional government operations for various programs included in the CAP (Table 44). This spending would support approximately 9,600 jobs. Local government would also incur about \$71 million in costs to implement the tree planting program. Depending on how that is implemented, that cost may also be revenue for the private or not for profit sector, but in this analysis it is not treated as an economic benefit. It is estimated that \$71 million in local government spending could result in the shift of more than 420 jobs from other activities.

When all the compliance costs, construction revenues, federal/state funds, health benefits and energy savings are totaled, the proposed measures will generate a net increase of 21,300 jobs and \$2.3 billion to the region.

**TABLE 44
REGIONAL IMPACT ANALYSIS BY SECTOR
(DOLLARS IN \$ MILLIONS)**

CAP Measures	Net Benefit or Cost By Rule Type	Affected Groups					
		Business and Industry		Households		Public Sector	
		Benefits	Costs	Benefits	Costs	Benefits	Costs
Stationary Source							
Compliance Costs							
Employment Change	(82)		(64)		(18)		
Output Change	(\$44.8)		(\$35.0)		(\$9.8)		
Health Benefits							
Employment Change	378	378					
Output Change	\$75.40	\$75.40					
Mobile Source							
Compliance Costs							
Employment Change	(310)		(232)		(79)		
Output Change	(\$54.1)		(\$40.4)		(\$13.7)		
State/Federal Funding							
Employment Gains	620					620	
Output Gains	\$108.20					\$108.20	
Health Benefits							
Employment Change	324	324					
Output Change	\$64.50	\$64.50					
Transportation Controls							
Compliance Costs							
Employment Change	(2,498)				(3,989)	1,491	
Output Change	(\$704.2)				(\$821.2)	\$117.1	
State/Federal Funding							
Employment Change	21,248	13,796				7,453	
Output Change	\$2,481.9	\$2,046.7				\$435.1	
Health Benefits							
Employment Change	1,449	1,449					
Output Change	\$288.9	\$288.9					
Energy and Climate Control							
Compliance Costs							
Employment Change	(847)		(356)		(68)		(423)
Output Change	(\$142.2)		(\$59.7)		(\$11.4)		(\$71.0)
Health/Energy Saving Benefits							
Employment Change	414	414					
Output Change	\$91.5	\$91.5					
Land Use and Local Impact							
Compliance Costs							
Employment Change	(17)		(17)				
Output Change	(\$2.8)		(\$2.8)				
Health Benefits							
Employment Change	606	606					
Output Change	\$120.72	\$120.72					

TABLE 44
REGIONAL IMPACT ANALYSIS BY SECTOR
(DOLLARS IN \$ MILLIONS)

CAP Measures	Net Benefit or Cost By Rule Type	Affected Groups					
		Business and Industry		Households		Public Sector	
		Benefits	Costs	Benefits	Costs	Benefits	Costs
Total Net Benefits/Costs Impact by Sector							
Compliance Costs							
Employment Change	-3754	0	(669)	0	(4154)	1491	(423)
Output Change	(\$948.2)	0	(\$137.9)	0	(\$856.1)	\$117.1	(\$71.0)
State/Federal/Local							
Employment Change	21,868	13,796	0	0	0	8,073	0
Output Change	\$2,590.1	\$2,046.7	0	0	0	\$543.3	0
Health Benefits							
Employment Change	3,171	3,171	0	0	0	0	0
Output Change	\$641.0	\$641.0	0	0	0	0	0
Summary of Total Net Impacts							
Employment Change	21,285	16,967	(669)	0	(4,154)	9,564	(423)
Output Change	\$2,282.9	\$2,687.7	(\$137.9)	0	(\$856.1)	\$660.4	(\$71.0)

Source: ADE, Inc.

**TABLE 45
CONTROL MEASURES AND THE PUBLIC SECTOR**

CM #s	Proposed Control Measure Description	Administering Public Agencies	Affected Public Agencies	Other Affected Public Agencies	Affected Entities Other than Public Agencies	Annual Cost	Annual Program Incentives and/or federal-state pass throughs
MSM A-1	Clean fuel efficient vehicles	CARB	BAAQMD/MTC		consumers purchasing new fuel efficient vehicles		\$10,000,000
MSM A-2	Zero emission vehicles	CARB	BAAQMD/MTC		consumers purchasing new fuel efficient vehicles		\$14,400,000
MSM A-3	Green fleets	BAAQMD	Local government: City Hall/County seats		private sector with large fleets purchasing new fuel efficient vehicles		\$550,000
MSM A-4	Replacement or Repair of High-Emitting Vehicles	BAAQMD	N/A		private sector with autos subject to this rule		\$333,333
MSM B-1	HDV Fleet Modernization	BAAQMD	N/A		private sector with autos subject to this rule		\$58,333,333
MSM B-2	Low NOX retrofits HD ORVs	BAAQMD	N/A		private sector with autos subject to this rule		\$12,500,000
MSM B-3	Efficient Drive Trains	BAAQMD	Local government: schools		private sector with large fleets purchasing new fuel efficient vehicles		\$6,666,667
MSM C-1	Construction and Farming Equipment	BAAQMD	N/A		private sector with equipment subject to this rule		\$2,400,000
MSM C-2	Lawn Garden Equipment Emissions	BAAQMD	N/A		consumers purchasing new fuel efficient equipment		\$2,000,000
MSM C-3	Recreational Watercraft Emissions	BAAQMD	N/A		consumers purchasing new fuel efficient vehicles		\$1,000,000
TCM A-1	Improve Local & Area-Wide Bus Serv.	MTC	Interurban and Rural Bus Transportation				\$340,433,333
TCM A-2	Rail improvement	MTC	Urban Transit Systems				\$1,200,000,000
TCM B-1	Implement Freeway Performance Initiative	MTC	Highway, Street, and Bridge Construction				\$51,666,667
TCM B-2	Improve Transit Efficiency and Use	MTC	Transportation Program Administration				\$25,333,333
TCM B-3	Bay Area Express Lanes	MTC	Highway, Street, and Bridge Construction				\$108,000,000
TCM B-4	Goods Movement Improvements	MTC	Highway, Street, and Bridge Construction		General Truck freight		\$40,000,000
TCM C-1	Voluntary Employer Trip Reduction Program	BAAQMD	All industries				\$3,600,000
TCM C-2	Safe Routes to School and Transit	MTC	Local government: City Hall/County seats	Local government: schools			\$13,333,000
TCM C-3	Promote Rideshare Services	MTC	Transportation Program Administration (MTC & CMAs)				\$5,666,667
TCM C-4	Public Outreach and Education	MTC	Transportation Program Administration (MTC & CMAs)				\$4,333,333
TCM C-5	Public Outreach: Smart Driving	MTC	Transportation Program Administration (MTC & CMAs)				\$1,000,000
TCM D-1	Improve Bicycle Access and Facilities	MTC	Transportation Program Administration (MTC & CMAs)	Local government: City Hall/County seats			\$1,500,000
TCM D-2	Improve Pedestrian Access and Facilities	MTC	Transportation Program Administration (MTC & CMAs)	Local government: City Hall/County seats			\$40,000
TCM D-3	Support Local Land Use Strategies	MTC	Transportation Program Administration (MTC & CMAs)	Local government: City Hall/County seats			\$5,866,667
TCM E-1	Value Pricing	MTC	Transportation Program Administration (MTC & CMAs)		all commuters travelling over bridges		\$1,000,000
TCM E-2	Parking Policies	MTC	Transportation Program Administration (MTC & CMAs)	Local government: City Hall/County seats			\$1,478,171,150
TCM E-3	Transportation Pricing	MTC	Transportation Program Administration (MTC & CMAs)		vehicle operators / general freight truck operators		\$471,143,320
LUM-2	ISR	BAAQMD	Local government: City Hall/County seats		new residential/non-residential developments	\$53,186,315	
LUM-3	CEQA Guidelines	BAAQMD	Local government: City Hall/County seats		new residential/non-residential developments	\$76,642,368	
ECM-4	Tree Planting	MTC	Local government: City Hall/County seats			\$71,049,000	
						\$200,877,683	\$3,859,270,803

Source: ADE, Inc.

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7. CEQA ALTERNATIVES ANALYSIS

Pursuant to the California Environmental Quality Act (CEQA), the Air District has prepared a Draft Program Environmental Impact Report (DEIR) on the 2010 CAP. The DEIR identifies three alternatives to the preferred project. This chapter presents findings with respect to regional impacts stemming from the alternatives to the proposed project. Alternative One is the “No Project” alternative. No formal regional impact analysis was conducted on Alternative One. Alternative Two is referred to as the “Ozone Control Strategy Only,” and Alternative Three is the “Reduce Criteria Pollutants Only.”

Alternative Two differs from the preferred project in that it does not include several control measures. In particular, SSM-1, SSM-6, SSM-8, SSM-15, SSM-16, SSM-17, SSM-18, LUM-5, and LUM-6 are not included in Alternative Two. Alternative Three excludes SSM-15, SSM-17, SSM-18, LUM-5, and LUM-6.

It is important to note that, for purposes of the socioeconomic analysis of the 2010 CAP, the District has not yet issued cost estimates for SSM-1, SSM-2, SSM-4, SSM-6, SSM 7, SSM-10, SSM-15, SSM-16, SSM-17, SSM-18, LUM-5, and LUM-6. As a result, findings from a socioeconomic impact analysis of Alternative Three at this point in time would be the same as findings regarding the preferred project, since both do not analyze socioeconomic impacts stemming from SSM-1, SSM-6, and SSMs-15 through -18, but do analyze socioeconomic impacts for all the other control measures, which remain intact for both. Thus, the analysis below focuses solely on regional impact analysis of Alternative Two.

OVERALL REGIONAL IMPACT FINDINGS: ALTERNATIVE TWO

In the table below, Alternative Two direct impacts amount to \$1.034 billion; this is very similar to the preferred project direct impact of \$1.039 billion. While Alternative Two excludes a certain number of SSMs, cost data is only available for one of the excluded SSMs, namely SSM-8, petroleum coke calcining. Thus, the SSMs analyzed in the regional impact analysis chapter are the same SSMs analyzed in this chapter, but for that one SSM.

It is important to note that any direct impact job losses noted in the table below represent a worst-case scenario in which affected industries are not able to absorb costs stemming from the proposals. However, the analysis shows that for those control measures where cost information is available, impacts are less than significant across the board. Thus, in the worst case, an impact of \$1.034 billion translates to the potential direct loss of almost 5,200 jobs across a number of industries. The \$1.034 billion in direct impact results in a loss of another \$403.4 million by other establishments with which those directly affected by the control measures engage in buyer-supplier relations. Establishments indirectly affected by the control measures, in turn, could release approximately 1,700 workers, in the worst case scenario. The direct loss of 5,200 jobs and the indirect loss of another 1,700 jobs, in turn, induce the loss of another 2,900 jobs. The induced impacts result from reduced retail and

services expenditures by workers in their respective communities, forcing business owners to reduce their workforce.

However the control measures also expect to benefit the region by \$4.5 billion due to new construction activity and improved health resulting from cleaner air. Of the \$4.5 billion in benefits, \$3.7 billion is attributable to construction activity and capital equipment purchases, with \$730 million attributable to benefits stemming from improved air quality. Both benefits generate jobs: 25,700 construction/capital equipment-related jobs and 3,200 permanent jobs because of cleaner air. On a net basis, the control measures expect to benefit the region by \$3.44 billion.

Thus, the table below also includes analysis on the net effects of the proposed control measured under the 2010 CAP. The measures directly benefit the region in the amount of \$3.44 billion in net impacts, which translates into 23,700 net new jobs. The \$3.44 billion in net direct impact generates \$775.3 million in economic activity by establishments engaged in buyer-supplier relations with industries directly affected by the control. Establishments indirectly affected by the control measures, in turn, could increase the number of jobs by 4,100 workers. The direct net increase of 23,700 jobs and the indirect increase of 4,100 jobs, in turn, generate a net increase of another 8,800 jobs, as new workers in industries directly and indirectly affected by the control measures purchase goods and services from local retailers and service-providers, who, in turn, hire more workers. The net impact of the all proposed control measures under Alternative Two is an increase of 36,500 jobs to the region.

TABLE 46
SUMMARY OF MULTIPLIER IMPACTS FROM ALL CONTROLS
(DOLLARS IN \$ MILLIONS)

	Direct Impacts	Indirect Impacts	Induced Impacts	Total Impacts
Control Benefits				
Industry Output (millions)	\$4,470.3	\$1,178.8	\$1,863.6	\$7,512.7
Employment	28,900	5,800	11,600	46,300
Labor Income (millions)	\$1,989.6	\$451.6	\$645.3	\$3,086.5
Control Costs				
Industry Output (millions)	(\$1,034.0)	(\$403.4)	(\$483.3)	(\$1,920.7)
Employment	(5,206)	(1,716)	(2,880)	(9,801)
Labor Income (millions)	(\$398.3)	(\$140.0)	(\$171.0)	(\$709.2)
Net Control Impacts				
Industry Output (millions)	\$3,436.3	\$775.3	\$1,380.4	\$5,592.0
Employment	23,686	4,091	8,759	36,536
Labor Income (millions)	\$1,591.3	\$311.6	\$474.3	\$2,377.2

Source: ADE Inc., data from IMPLAN input-output model

CONTROL MEASURE IMPACT ANALYSIS: ALTERNATIVE TWO

The District is proposing 18 stationary source measures in the 2010 CAP. Of the 18 measures, BAAQMD has preliminary issued cost estimated for eight control measures, of \$44,793,334. Alternative Two excludes SSM-1, SSM-6, SSM-8, SSM-15, SSM-16, SSM-17, and SSM-18. Of these alternatives, the District has issued cost estimates only for SSM-8. Thus, Alternative Two generates costs amounting to \$39,616,286.

In addition to cost stemming from the proposed SSMs per Alternative Two, the measures also generate health benefits directly valued at \$75.4 million a year. For purposes of the Alternative Two regional impact analysis, we only analyze health benefits for those Alternative Two control measures that also have known costs, so as to not overstate the benefits-to-cost analysis. It is important to note that any direct impact job losses noted in the table below represent a worse case scenario in which affected industries are not able to absorb costs stemming from the proposals.

However, the analysis shows that for those control measures where cost information is available, impacts are less than significant across the board. Taking into account costs and benefits, on balance, the SSM will generate a negative \$35.7 million in net direct impacts. This occurs because health benefits of \$75.4 million are off-set by stationary source Alternative Two impacts of \$39.6 million. As indicated below, 300 net new jobs are directly created largely because at 400 jobs, there are more jobs created via the health benefits than there are jobs lost via the control losses (i.e. 100 direct jobs lost), resulting in a net job creation of 300. Taking into account indirect and induced multiplier effects, the stationary source control measures under Alternative Two results in an overall net increase of 600 jobs.

TABLE 47
SUMMARY OF MULTIPLIER IMPACTS FROM STATIONARY SOURCE CONTROLS
(DOLLARS IN \$ MILLIONS)

	Direct Impacts	Indirect Impacts	Induced Impacts	Total Impacts
Stationary Source Control Health Benefits				
Industry Output (million)	\$75.4	\$33.7	\$36.9	\$146.0
Employment	400	100	200	700
Labor Income (million)	\$28.0	\$11.7	\$13.1	\$52.8
Stationary Source Control Losses				
Industry Output (million)	(\$39.6)	(\$10.2)	(\$6.4)	(\$56.3)
Employment	(100)	0	0	(200)
Labor Income (million)	(\$5.2)	(\$3.1)	(\$2.3)	(\$10.6)
Net Stationary Source Control Impacts				
Industry Output (million)	\$35.7	\$23.4	\$30.5	\$89.7
Employment	300	100	200	600
Labor Income (million)	\$22.8	\$8.7	\$10.8	\$42.3

Source: ADE Inc., data from IMPLAN input-output model

Under Alternative Two, the remaining control measures are the same as the ones in the preferred project, meaning that direct, indirect and induced impacts are the same for these control measure categories.

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APPENDIX A: HOUSEHOLD RETAIL AND SELECT SERVICES SPENDING BY AGE OF HOUSEHOLDER AND BROAD ETHNICITY

APPENDIX A HOUSEHOLD CONSUMER SPENDING

	ALL	Not Latino Households				Latino Households			
		<25	25-34	35-64	>65	<25	25-34	35-64	>65
Total (Retail and Select Services)	\$66,625,831,234	\$828,305,052	\$6,308,177,641	\$37,438,908,175	\$7,952,561,747	\$411,449,714	\$2,708,726,091	\$9,365,727,781	\$1,422,118,827
Apparel Store	\$2,725,648,950	\$42,900,048	\$279,135,335	\$1,418,967,834	\$246,693,253	\$26,447,033	\$170,957,656	\$503,971,461	\$36,576,331
General Merchandise	\$10,145,623,413	\$113,720,660	\$900,641,960	\$5,561,207,942	\$1,380,926,972	\$67,724,457	\$465,586,723	\$1,423,861,818	\$231,952,883
Specialty Retail	\$3,753,089,044	\$44,412,371	\$359,754,334	\$2,320,742,203	\$452,771,186	\$14,963,299	\$137,821,953	\$378,974,792	\$43,648,905
Food, Eating and Drinking	\$18,237,686,973	\$240,954,211	\$1,763,961,959	\$9,900,804,608	\$2,271,335,874	\$136,197,675	\$865,321,465	\$2,660,802,703	\$398,308,479
Building Materials/ Homefurnishings	\$5,470,490,914	\$42,757,723	\$422,688,459	\$3,448,313,213	\$580,512,990	\$24,804,433	\$155,010,629	\$709,613,087	\$86,790,379
Automotive	\$19,918,132,816	\$276,984,179	\$2,021,209,026	\$10,580,723,402	\$2,317,957,507	\$141,312,818	\$914,027,665	\$3,136,546,722	\$529,371,497
Professional Services	\$287,325,403	\$1,507,246	\$24,110,482	\$186,475,816	\$60,072,191	\$101,183	\$1,973,426	\$6,235,399	\$6,849,660
Medical Services	\$1,734,219,152	\$13,766,257	\$135,484,709	\$1,089,844,630	\$262,392,531	\$4,600,766	\$46,608,921	\$139,505,354	\$42,015,983
Personal Services	\$1,296,843,204	\$14,363,793	\$140,088,177	\$932,842,049	\$62,187,890	\$7,347,419	\$21,716,820	\$106,497,810	\$11,799,245
Select Entertainment and Recreation	\$880,794,917	\$16,056,380	\$79,049,964	\$565,344,717	\$73,423,497	\$5,067,701	\$30,315,628	\$107,040,850	\$4,496,179
Mail and Package Delivery	\$369,242,856	\$2,215,533	\$31,333,008	\$199,466,715	\$56,138,295	\$1,049,511	\$12,445,056	\$53,869,268	\$12,725,470
Select Repair Services	\$1,806,733,592	\$18,666,650	\$150,720,228	\$1,234,175,046	\$188,149,561	\$12,192,566	\$46,437,208	\$138,808,517	\$17,583,816

Source: ADE, Inc., based on US Census and US BLS

Note: The spending figures also account for variations by income level.

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APPENDIX B: NATIONAL TRANSIT DATABASE (2006): FEDERAL TRANSIT ADMINISTRATION: 2006 TRANSIT PROFILES

APPENDIX B NATIONAL TRANSIT DATABASE (2006): FEDERAL TRANSIT ADMINISTRATION: 2006 TRANSIT PROFILES: ALL REPORTING AGENCIES

	Fare Revenue Only	Fare Revenues	Total Revenue	Unlinked Trips	Fare Per Trip
1 San Francisco Bay Area Rapid Transit District (BART) Heavy Rail	\$255,649,599	51%	\$501,273,724	103,654,118	\$2.47
2 Sam Trans	\$17,255,931	15%	\$115,039,540	15,016,685	\$1.15
Santa Clara Valley Transportation Authority (VTA)	\$37,183,014	11%	\$338,027,400	40,934,975	\$0.91
Bus	\$27,085,779		\$246,234,355	31,674,070	\$0.86
Light Rail	\$7,248,843		\$65,898,573	8,279,807	\$0.88
Demand Response	\$2,848,392		\$25,894,473	981,098	\$2.90
3 Alameda-Contra Costa Transit District (AC Transit)	\$48,969,669	18%	\$272,053,717	66,962,680	\$0.73
San Francisco Municipal Railway (MUNI)	\$134,554,583	28%	\$428,491,394	210,848,310	\$0.64
Bus	\$51,358,460		\$183,423,071	90,630,173	\$0.57
Trolleybus	\$39,228,209		\$140,100,746	69,064,602	\$0.57
Light Rail	\$23,722,091		\$84,721,754	43,678,772	\$0.54
Cable Car	\$20,245,823		\$20,245,823	7,474,763	\$2.71
4 Golden Gate Bridge, Highway and Transportation District (GGBHTD)	\$23,420,295	11%	\$212,911,773	9,465,372	\$2.47
Bus	\$14,833,502		\$134,850,018	7,496,242	\$1.98
Ferryboat	\$8,341,748		\$75,834,073	1,870,169	\$4.46
Demand Response	\$245,045		\$2,227,682	98,961	\$2.48
5 City of Santa Rosa (Santa Rosa CityBus)	\$1,588,167	19%	\$8,358,774	2,617,572	\$0.61
Bus	\$1,493,045		\$7,858,132	2,567,413	\$0.58
Demand Response	\$95,122		\$500,642	50,159	\$1.90
6 City of Vallejo Transportation Program (Vallejo Transit, Baylink)	\$9,994,433	11%	\$90,858,482	3,280,912	\$3.05
Bus	\$3,566,058		\$32,418,709	2,491,331	\$1.43
Ferryboat	\$6,203,914		\$56,399,218	751,706	\$8.25
Demand Response	\$224,461		\$2,040,555	37,875	\$5.93
7 Central Contra Costa Transit Authority (County Connection)	\$4,294,058	15%	\$28,627,053	4,279,683	\$1.00
Bus	\$3,879,429		\$25,862,860	4,114,606	\$0.94
Demand Response	\$414,629		\$2,764,193	165,077	\$2.51
8 Napa County Transportation Planning Agency (NCTPA)	\$727,432	13%	\$5,595,631	843,423	\$0.86
Bus	\$640,470		\$4,926,692	803,651	\$0.80
Demand Response	\$86,962		\$668,938	39,772	\$2.19

APPENDIX B
NATIONAL TRANSIT DATABASE (2006): FEDERAL TRANSIT ADMINISTRATION: 2006 TRANSIT PROFILES: ALL REPORTING AGENCIES

	Fare Revenue Only	Fare Revenues	Total Revenue	Unlinked Trips	Fare Per Trip
9 Sonoma County Transit	\$1,727,125	15%	\$11,514,167	1,359,879	\$1.27
Bus	\$1,615,118		\$10,767,453	1,323,912	\$1.22
Demand Response	\$112,007		\$746,713	35,967	\$3.11
10 City of Fairfield - Fairfield-Suisun Transit (FST)	\$953,982	16%	\$5,962,388	809,517	\$1.18
Bus	\$878,235		\$5,488,969	777,136	\$1.13
Demand Response	\$75,747		\$473,419	32,381	\$2.34
11 Peninsula Corridor Joint Powers Board (PCJPB)	\$30,186,123	41%	\$73,624,690	10,135,247	\$2.98
Bus	\$1,341,381		\$3,271,661	1,130,585	\$1.19
Commuter Rail	\$28,844,742		\$70,353,029	9,004,662	\$3.20
12 Livermore / Amador Valley Transit Authority (LAVTA)	\$1,779,920	16%	\$11,124,500	2,103,153	\$0.85
Bus	\$1,676,045		\$10,475,281	2,036,955	\$0.82
Demand Response	\$103,875		\$649,219	66,198	\$1.57
City of Alameda Ferry Services Ferryboat	\$2,414,757	52%	\$4,643,763	520,741	\$4.64
13 Western Contra Costa Transit Authority (WestCAT)	\$1,249,530	18%	\$6,941,833	1,307,349	\$0.96
Bus	\$1,193,529		\$6,630,717	1,260,324	\$0.95
Demand Response	\$56,001		\$311,117	47,025	\$1.19
14 City of Union City Transit Division (UCT)	\$348,146	11%	\$3,164,964	417,854	\$0.83
Bus	\$313,162		\$2,846,927	398,006	\$0.79
Demand Response	\$34,984		\$318,036	19,848	\$1.76
15 Eastern Contra Costa Transit Authority (Tri Delta Transit)	\$2,121,477	14%	\$15,153,407	2,543,890	\$0.83
Bus	\$1,905,776		\$13,612,686	2,441,212	\$0.78
Demand Response	\$215,701		\$1,540,721	102,678	\$2.10
16 ATC / Vancom		8%			
Demand Response	\$1,899,741		\$23,746,763	656,058	\$2.90
17 City of Benicia (Benicia Breeze)	\$194,713	15%	\$1,298,087	137,237	\$1.42
Bus	\$172,216		\$1,148,107	120,871	\$1.42
Demand Response	\$22,497		\$149,980	16,366	\$1.37
18 San Francisco Paratransit (ATC)		7%			
Demand Response	\$1,411,424		\$20,163,200	1,218,248	\$1.16
TOTAL	\$540,741,105		\$1,840,547,848	438,177,928	\$1.23
Bus Only	\$111,952,205		\$689,815,638	149,266,487	\$0.75
Fixed System	\$374,939,307		\$882,593,649	241,156,724	\$1.55
Water	\$16,960,419		\$136,877,054	3,142,616	\$5.40

Source: ADE, Inc., based on US Federal Transit Administration (US DOT)

APPENDIX C: NUMBER OF HOUSEHOLDS IN THE SF BAY AREA REGION BY TENURE, MORTGAGE STATUS, INCOME, AND TYPE OF BUILDING

APPENDIX C SOCIOECONOMIC IMPACT ANALYSIS: HOUSEHOLDS POTENTIALLY IMPACTED BY PROPOSED STATIONARY SOURCE MEASURES SSM 11 AND SSM 12

	Number of Households 2008				Average Household Income 2008			
	All Households	Owner-Occupied w/Mortgage	Owner-Occupied w/o Mortgage	Renter-Occupied	All Households	Owner-Occupied w/Mortgage	Owner-Occupied w/o Mortgage	Renter-Occupied
Total	2,507,539	1,140,439	346,075	1,021,025	\$103,291	\$139,074	\$93,941	\$66,492
Owner-Occupied:	1,486,514	1,140,439	346,075		\$128,566	\$139,074	\$93,941	
1, detached or attached	1,314,605	1,008,552	306,053		\$133,518	\$144,430	\$97,559	
2 to 4	52,860	40,554	12,306		\$103,222	\$111,658	\$75,423	
5 or more	73,863	56,667	17,196		\$78,313	\$84,714	\$57,222	
Renter occupied:	1,021,025			1,021,025	\$66,492			\$66,492
1, detached or attached	305,392			305,392	\$86,401			\$86,401
2 to 4	186,270			186,270	\$66,085			\$66,085
5 or more	520,636			520,636	\$54,880			\$54,880

Source: ADE, Inc., based on US Census

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**APPENDIX D: NUMBER OF HOUSEHOLDS IN THE SF BAY AREA REGION BY
TENURE, MORTGAGE STATUS, INCOME, TYPE OF BUILDING:
RETAIL/SELECT SERVICE SPENDING, HOUSEHOLD FURNISHING AND
EQUIPMENT, AND HOME HEATING**

**APPENDIX D
SOCIOECONOMIC IMPACT ANALYSIS: HOUSEHOLDS POTENTIALLY IMPACTED BY PROPOSED STATIONARY SOURCE MEASURES SSM 11 AND SSM 12**

	US BLS Spending: Household Consumer Spending: Retail and Select Services				US BLS Spending: Household Furnishing and Equipment				US BLS Spending: Home Heating			
	All Households	Owner- Occupied w/Mortgage	Owner- Occupied w/o Mortgage	Renter- Occupied	All Households	Owner- Occupied w/Mortgage	Owner- Occupied w/o Mortgage	Renter- Occupied	All Households	Owner- Occupied w/Mortgage	Owner- Occupied w/o Mortgage	Renter- Occupied
Total	\$36,039	\$42,841	\$31,974		\$2,642	\$3,091	\$2,163	\$1,548	\$2,642	\$3,091	\$2,163	\$1,548
Owner-Occupied:	\$39,604	\$42,841	\$31,974		\$3,091	\$3,091	\$2,163		\$2,444	\$2,657	\$2,231	
1, detached or attached	\$41,129	\$44,491	\$33,206		\$3,091	\$3,091	\$2,163		\$2,674	\$2,818	\$2,530	
2 to 4	\$36,015	\$38,959	\$25,671		\$2,642	\$2,642	\$1,902		\$2,516	\$2,623	\$2,409	
5 or more	\$26,655	\$28,834	\$22,593		\$1,902	\$2,163	\$1,548		\$2,142	\$2,530	\$1,753	
Renter occupied:	\$25,126			\$25,126	\$1,548			\$1,548	\$1,913			\$1,913
1, detached or attached	\$29,408			\$29,408	\$2,163			\$2,163	\$2,530			\$2,530
2 to 4	\$19,264			\$19,264	\$1,548			\$1,548	\$1,753			\$1,753
5 or more	\$21,668			\$21,668	\$1,548			\$1,548	\$1,456			\$1,456

Source: ADE, Inc. , based on US Census and US BLS

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APPENDIX E: CALIFORNIA STATE CONTROLLER'S ANNUAL REDEVELOPMENT REPORT, 2009

APPENDIX E CALIFORNIA STATE CONTROLLER'S ANNUAL REDEVELOPMENT REPORT, 2009

	Assessed Valuation (cumulative)	Tax Increment Assessed Valuation (cumulative)	Total Indebtedness (cumulative)	Total RDA Tax Increment for Year (2008-2009)	Total Expenditures For year (2008-2009)
Alameda County	\$200,375,589,522	\$24,519,264,050	\$7,914,581,304	\$232,467,061	\$354,971,244
Contra Costa County	\$162,684,644,855	\$18,882,326,142	\$2,997,684,981	\$175,503,227	\$382,782,736
Marin County	\$54,220,914,809	\$2,829,818,364	\$261,821,223	\$10,179,396	\$18,020,081
Napa County	\$26,312,768,290	\$374,272,574	\$51,494,810	\$4,300,361	\$5,280,949
San Francisco	\$135,513,655,392	\$10,571,321,247	\$1,114,047,410	\$92,470,983	\$242,216,578
San Mateo County	\$137,076,563,828	\$12,560,917,571	\$1,341,609,119	\$99,200,693	\$147,477,155
Santa Clara County	\$299,229,303,992	\$26,517,748,844	\$5,888,373,280	\$264,725,032	\$535,427,184
Solano County	\$48,419,344,298	\$9,479,249,695	\$2,502,818,892	\$70,221,378	\$104,238,039
Sonoma County	\$69,514,524,774	\$7,149,787,695	\$1,064,720,956	\$53,175,102	\$106,725,194
	\$1,133,347,309,760	\$112,884,706,182	\$23,137,151,975	\$1,002,243,233	\$1,897,139,160

Source: ADE, Inc., based on California State Controller

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APPENDIX F: DISTRIBUTION OF ENERGY SAVINGS BASED ON AGGREGATE AND AVERAGE ENERGY CONSUMPTION

APPENDIX F DISTRIBUTION OF ENERGY SAVINGS BASED ON AGGREGATE AND AVERAGE ENERGY CONSUMPTION

	Establishments /Households	Employment	Per Capita Energy Consumption	Aggregate Energy Consumption	Distribution of ECM-1 Savings	Distribution of ECM-3 Savings
				\$12,042,645,816	-\$31,992,341	-\$1,199,640
					-\$31,992,341	-\$1,199,640
Private and Public: All	243,177	3,148,847		\$6,259,601,894	-\$16,629,179	-\$623,556
Total, all industries (private ownership):	238,317	2,727,987		\$5,541,023,922	-\$14,720,214	-\$551,975
Goods-Producing	23,114	503,436		\$3,041,848,401	-\$8,080,936	-\$303,017
Natural Resources and Mining	1,112	16,120	\$6,170	\$99,452,934	-\$264,205	-\$9,907
Construction	14,238	165,536	\$2,429	\$402,117,615	-\$1,068,261	-\$40,057
Manufacturing	7,764	321,780		\$2,540,277,853	-\$6,748,470	-\$253,052
311 Food mfg		12,681	\$7,001	\$88,776,974	-\$235,844	-\$8,844
312 Beverage & tobacco product mfg		25,797	\$7,942	\$204,882,917	-\$544,289	-\$20,410
313 Textile mills		9	\$8,871	\$80,892	-\$215	-\$8
314 Textile product mills		631	\$3,377	\$2,132,691	-\$5,666	-\$212
315 Apparel mfg		3,039	\$1,526	\$4,635,926	-\$12,316	-\$462
316 Leather & allied product mfg		17	\$1,902	\$32,339	-\$86	-\$3
321 Wood product mfg		1,272	\$4,469	\$5,683,646	-\$15,099	-\$566
322 Paper mfg		3,023	\$21,966	\$66,405,560	-\$176,412	-\$6,615
323 Printing & related support activities		11,320	\$2,495	\$28,241,175	-\$75,025	-\$2,813
324 Petroleum & coal products mfg		9,918	\$121,030	\$1,200,336,826	-\$3,188,800	-\$119,573
325 Chemical mfg		7,237	\$29,358	\$212,473,171	-\$564,454	-\$21,166
326 Plastics & rubber products mfg		2,218	\$5,713	\$12,669,561	-\$33,658	-\$1,262
327 Nonmetallic mineral product mfg		3,126	\$15,497	\$48,450,323	-\$128,713	-\$4,826
331 Primary metal mfg		14	\$28,440	\$390,611	-\$1,038	-\$39
332 Fabricated metal product mfg		22,617	\$3,497	\$79,083,018	-\$210,091	-\$7,878
333 Machinery mfg		17,756	\$2,469	\$43,835,296	-\$116,452	-\$4,367
334 Computer & electronic product mfg		174,877	\$2,816	\$492,375,058	-\$1,308,037	-\$49,048
335 Electrical equipment, appliance, & component mfg		2,737	\$3,198	\$8,753,639	-\$23,255	-\$872
336 Transportation equipment mfg		1,273	\$3,159	\$4,021,694	-\$10,684	-\$401
337 Furniture & related product mfg		6,112	\$1,598	\$9,768,308	-\$25,950	-\$973
339 Miscellaneous mfg		16,106	\$1,692	\$27,248,228	-\$72,387	-\$2,714
Service-Providing	215,203	2,224,553		\$2,499,175,521	-\$6,639,278	-\$248,958
Trade, Transportation, and Utilities	30,840	526,559	\$1,563	\$823,189,307	-\$2,186,874	-\$82,003

APPENDIX F
DISTRIBUTION OF ENERGY SAVINGS BASED ON AGGREGATE AND AVERAGE ENERGY CONSUMPTION

	Establishments /Households	Employment	Per Capita Energy Consumption	Aggregate Energy Consumption	Distribution of ECM-1 Savings	Distribution of ECM-3 Savings
Information	3,477	112,028	\$1,707	\$191,277,035	-\$508,144	-\$19,054
Financial Activities	18,775	186,333	\$657	\$122,430,571	-\$325,248	-\$12,196
Professional and Business Services	36,804	567,658	\$516	\$292,852,572	-\$777,988	-\$29,173
Education and Health Services	19,855	358,359	\$923	\$330,824,491	-\$878,864	-\$32,955
Leisure and Hospitality	16,886	314,110	\$1,785	\$560,797,056	-\$1,489,806	-\$55,864
Other Services	79,983	148,383	\$1,115	\$165,405,461	-\$439,414	-\$16,477
Unclassified	8,593	11,123	\$1,115	\$12,399,028	-\$32,939	-\$1,235
Government Ownership:	4,860			\$718,577,971	-\$1,908,965	-\$71,582
Federal Government	546	49,969	\$1,707	\$85,317,261	-\$226,653	-\$8,499
State Government	1,585	82,135	\$1,707	\$140,237,613	-\$372,553	-\$13,970
Local Government	2,729	288,756	\$1,707	\$493,023,097	-\$1,309,759	-\$49,113
Households	2,453,626			5,783,043,922	-15,363,162	-576,084
Owner-Occupied:	1,105,773			3,091,839,535	-8,213,742	-307,997
1, detached or attached	1,008,552		\$2,818	2,842,099,809	-\$7,550,286	-\$283,119
2 to 4 units	40,554		\$2,623	106,372,289	-\$282,587	-\$10,596
5 or more units	56,667		\$2,530	143,367,437	-\$380,868	-\$14,282
Owner-Occupied:	335,555			834,104,421	-2,215,871	-83,090
1, detached or attached	306,053		\$2,530	774,313,845	-\$2,057,032	-\$77,134
2 to 4 units	12,306		\$2,409	29,645,937	-\$78,757	-\$2,953
5 or more units	17,196		\$1,753	30,144,639	-\$80,082	-\$3,003
Renter occupied:	1,012,298			1,857,099,966	-4,933,548	-184,997
1, detached or attached	305,392		\$2,530	772,641,760	-\$2,052,590	-\$76,967
2 to 4 units	186,270		\$1,753	326,531,310	-\$867,459	-\$32,528
5 or more units	520,636		\$1,456	757,926,896	-\$2,013,499	-\$75,502

Source: ADE, Inc., based on US BLS and US Census

APPENDIX G: ANNUAL CONSTRUCTION PERMIT VALUATION TRENDS: SAN FRANCISCO BAY AREA

APPENDIX G ANNUAL CONSTRUCTION PERMIT VALUATION TRENDS: SAN FRANCISCO BAY AREA

	2000	2001	2002	2003	2004	2005	2006	2007	00-07 Avg
Residential	\$8,059,626,496	\$6,770,532,901	\$8,524,663,179	\$7,092,016,463	\$8,430,529,187	\$8,946,104,231	\$7,851,048,992	\$6,840,721,115	\$7,814,405,321
Non-residential	\$8,979,340,397	\$7,184,264,762	\$5,389,637,989	\$3,907,831,970	\$4,352,775,250	\$5,601,371,360	\$6,803,596,055	\$7,613,171,594	\$6,228,998,672
Annual Total	\$17,038,966,892	\$13,954,797,664	\$13,914,301,168	\$10,999,848,433	\$12,783,304,437	\$14,547,475,591	\$14,654,645,048	\$14,453,892,709	\$14,043,403,993

Source: ADE, Inc. , based on California Statistical Abstract

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APPENDIX H

When conducting the socioeconomic impact analysis, we turn to a variety of sources for estimating an after-tax net profit rate, which we then apply against revenues generated by affected sources and industries, to estimate discrete after-tax net profits. The table below includes raw data on sales and equity generated by industries. Data in the table below come from the US IRS. That source also has enough information to calculate industry-specific after-tax net profits. Comparing the after-tax net profit amount against sales results in a net profit rate, particularly a “return on sales” rate. Comparing the after-tax net profit amount against industry equity results in a net profit rate expressed as a “return on equity.”

**APPENDIX H
SALES, EQUITY AND AFTER TAX NET PROFITS**

US IRS 2006	Sales ('000)	Equity ('000)	After-Tax Net Profits ('000)	ROS	ROE
Agriculture, forestry, fishing and hunting	\$127,728,942	\$41,888,111	\$7,665,137	6.0%	18.3%
Mining	\$327,272,187	\$301,618,194	\$54,567,732	16.7%	18.1%
Construction	\$1,582,459,140	\$235,900,066	\$80,733,939	5.1%	34.2%
Manufacturing	\$6,939,924,620	\$3,472,835,947	\$449,209,101	6.5%	12.9%
Wholesale trade	\$3,600,433,365	\$792,110,967	\$106,408,479	3.0%	13.4%
Retail trade	\$3,486,005,061	\$535,392,876	\$100,322,818	2.9%	18.7%
Transportation and warehousing	\$712,406,648	\$169,869,060	\$30,825,843	4.3%	18.1%
Information	\$943,412,447	\$1,398,529,600	\$103,365,198	11.0%	7.4%
Finance and insurance	\$1,893,916,912	\$15,425,982,243	\$598,760,121	31.6%	3.9%
Real estate and rental and leasing	\$286,352,886	\$234,491,052	\$33,858,823	11.8%	14.4%
Professional, scientific, and technical services	\$887,903,283	\$241,059,087	\$64,714,112	7.3%	26.8%
Health care and social assistance	\$37,263,167	\$9,292,323	\$34,449,132	6.2%	64.5%
Arts, entertainment, and recreation	\$558,081,916	\$53,450,392	\$7,580,583	8.8%	37.0%
Accommodation and food services	\$85,789,078	\$20,471,164	\$23,867,654	5.7%	19.9%
Other services	\$416,996,282	\$119,639,851	\$10,126,632	5.0%	30.8%

Source: ADE, Inc. , based on US IRS

When estimating amount of net profits generated by affected sources and industries in the region, we prefer to use the ROS method because while the US Census publishes equity data for industries at the national level, the Census publishes industry-specific revenue data

at all levels, including county and region. While it is possible to estimate local and regional equity using the IRS' national equity data, it is important to note that, relative to revenues, there is greater variability with respect to equity retained by establishments, even those in the same industries, as a number of factors contribute to equity. On the other hand, there is less variability when it comes to revenues, as similarly-sized establishments in similar industries in the same regions and/or across the nation, more or less, generate the same amount of revenues, with respect to firm-wide revenues and revenues on per unit bases (i.e. revenues per worker). Thus, analysts can use national or state level revenue data when local and/or regional industry-specific revenue data are not available from the US Census. In a hypothetical situation, there could be two manufacturing plants in the same industries, both employing 20 workers, who, on average generate \$200,000 per worker. Thus, each hypothetical site generates \$4 million. However, one plant leases its site and equipment, while the other owns the property on which it operates, as well the equipment, resulting in the latter having more equity relative to the former even though each generates similar revenues. Thus, while extra caution is warranted when using national-level equity data to estimate local and regional industries' equity, for the most part, such is not the case when using national or state revenue data to estimate local and regional revenues, when such data is not readily available from the US Census. In the end, the discrete amount of net profits generated by an industry or source affected by a rule should be the same whether one multiplies a ROS rate against revenues or a ROE rate against equity.

APPENDIX I: REGIONAL GROSS REGIONAL PRODUCT

How to Measure Output (Source: Council for Economic Education; summarized from BEA Publications)

The most common method of measurement of gross domestic product (GDP) is the sum of **personal consumption expenditures, gross private domestic investment, government consumption expenditures and gross investment, and net exports of goods and services**. This is known as the “expenditures” or “product side” approach to measuring GDP.

Another way to measure GDP is as the **sum of the charges generated in the production of the final goods and services**. Because the market price of a final good or service reflects all the charges associated with producing that good or service, an “income-side” measure of output, gross domestic income (GDI), can be derived as the sum of the charges against production. Specifically, GDI is measured as the sum of **compensation of employees** (the return to labor), **taxes on production less subsidies** (a non-income charge against production), **net operating surplus** (the net return to capital and entrepreneurship), and **consumption of fixed capital** (the using up of capital).

In theory, GDP and GDI are equal. In practice, the differences in the data used to derive the two measures lead to a discrepancy. This “statistical discrepancy” is defined in the NIPAs as GDP less GDI. Because the source data used to derive product-side measures of output are based on more comprehensive surveys and censuses, BEA considers them more reliable. Therefore, the statistical discrepancy appears as a component on the income side of the account.

Another way to measure output used by BEA is known as the “value added” approach. In these accounts, value added is defined as the **difference between an industry’s total output**—that is, its sales plus the change in inventories arising from production — **and its intermediate purchases from other industries**. When value added is aggregated across all industries in the economy, industry sales to and purchases from each other cancel out, and the remainder is industry sales to final users, or GDP.

Applying GDP to IMPLAN Input-Output Model Data

The IMPLAN model uses industry output as the primary computational measure. Industry output comprises the sum of the “value added” and the value of the intermediate commodity purchases required to produce the final output. The “value added” component is equivalent to the GDP, as measured using the “value added” approach. The components in the model that comprise “value added” are as follows:

- Employee compensation
- Proprietor income
- Property income
- Business taxes

Comparing GDP from IMPLAN and Other Sources

Using the value added as a measure of GDP, the 2008 total value added for the Bay Area counties totals \$498 billion. A 2008 study of the Bay Area economy by the Bay Area Economic Institute (using data from Moody's, economy.com, and McKinsey & Company) estimated the 2006 Bay Area GDP at \$399 billion, using measure of productivity as an equivalent measure for GDP.

The difference between the two studies arise from differences in methodology, as well as potential differences in the type of data included in the dataset. The IMPLAN dataset accounts for self-employment and proprietor income, while the Bay Area Economic Institute study does not indicate whether self-employment is included.

In addition, IMPLAN does not explicitly use the NAICS codes in its model sectoring. Information in Table X-X is an approximation of the industry definitions used in the Bay Area Economic Institute study.

APPENDIX J: SMALL BUSINESS DEFINITION

For purposes of qualifying small businesses for bid preferences on state contracts and other benefits, the State of California defines small businesses in the following manner¹³. To be eligible for small business certification, a business:

- Must be independently owned and operated;
- Cannot be dominant in its field of operation;
- Must have its principal office located in California
- Must have its owners (or officers in the case of a corporation) domiciled in California; and
- Together with its affiliates, be either:
 - A business with 100 or fewer employees, and an average gross receipts of \$10 million or less over the previous tax years, or
 - A manufacturer with 100 or fewer employees

¹³ State of California. Department of General Services. "California Small Business Certification" (<http://www.pd.dgs.ca.gov/smbus/sbcert.htm>)