

## **CHAPTER 4**

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### **EMPLOYMENT IMPACTS**

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## INTRODUCTION

As with the assessment of the Plan's costs and benefits, the employment impact assessment of the draft 1997 AQMP is also performed in two parts. In the first step, data on the costs of quantified control measures and benefits of the draft 1997 AQMP is input to the REMI model. The REMI model thereby projects job impacts. In the second step, the job impacts of unquantified control measures are projected based on the job impact derived from step one. Figure 4-1 shows the overall job growth of the four-county area between 1994 and 2010 without implementation of the draft 1997 AQMP. The employment impacts in this chapter represent deviations from the baseline regional job growth line illustrated in Figure 2-2.

## JOB IMPACTS FROM QUANTIFIED MEASURES AND BENEFITS

Implementation of the draft 1997 AQMP will improve visibility, decrease expenditures on refurbishing building surfaces, reduce morbidity and mortality, reduce congestion, and increase crop yields, as discussed in Chapter 3. The quantifiable total annual benefit for measures proposed in the draft 1997 AQMP amounts to approximately \$3.303 billion in 2010. Alternatively, the quantified measures will result in an annual cost of approximately \$1.335 billion in 2010. Both benefits and costs will affect the employment base in the four-county economy.

The four-county economy will expand from the net effects of three major forces. First, the substitution of imports (general consumer purchases) for local production (reduced health care services related to improved air quality) leads to jobs not created. Second, the increased cost of doing business leads to fewer jobs created due to the location effect and to the higher costs that reduce consumer purchasing power. Third, the improvement in the quality of life will make the area more attractive so that more people will move in until the expected real earnings rate is reduced enough to compensate for the estimated effect of the increased amenities. This influx will increase the labor force and increase local demand. Table 4-1 shows the average annual job impacts as well as impacts with respect to the years 2000 and 2010 for quantified control measures and benefits.

The total projected employment without the AQMP in 2010 is 10.3 million jobs. The quantifiable control measures will result in an average of 3,973 jobs created annually over the period 1997 to 2010. Out of the 28 quantified measures, control measure TCM-01 (Transportation Improvements), by itself, is projected to result in 11,492 jobs created from constructing and maintaining highway and transit (bus and rail) infrastructure. The remaining 27 quantifiable control measures are projected to have an annual impact of 7,461 jobs forgone.

It was assumed that the federal and state governments would finance 8 to 26 percent of the required expenditures under TCM-01 (SCAG). The remaining expenditures would be funded through local revenue sources amounting to approximately \$1.374 billion per year from 1997 to 2010. The proposed infrastructure projects under TCM-01 together with the out-of-area funding sources (from the federal and state governments) help stimulate the local economy, thereby resulting in job creation. However, it should be noted that the costs of these infrastructure projects will continue to be paid for long after these projects are completed.

The job impact of air quality benefits is assessed separately for each benefit category: visibility improvements; increased crop yields; health benefits; reduced congestion; and reduced expenditures on refurbishing building surfaces. Many of the benefits of improved air quality can be seen as both direct and indirect benefits to individuals living in the area. For example, reductions in out-of-pocket health expenditures are used as a proxy for the quality-of-life value of morbidity benefits (i.e., reduced illness). Due to improved air quality the growth of health-related occupations may decrease as health expenditure decreases. Nevertheless, a net gain of approximately 4,993 more jobs annually from the increased attractiveness of the area is still projected. Moreover, decreased congestion could create an additional 6,327 jobs. Together, the quantified benefits could result in an average of 15,582 jobs created annually.

When all the quantified control measures and benefits are combined, an average of 19,546 additional jobs are projected to be created annually in the four-county area between 1997 and 2010. The additional jobs principally result from improved air quality and expenditures in infrastructure.

**TABLE 4-1**  
Job Impacts of Quantified Measures and Benefits

Category	2000	2010	Average Annual (1997-2010)
Control Measures	12,132	-10,652	3,973
Benefit	4,002	37,909	15,582
Congestion Relief	0	17,610	6,327
Visibility Improvements	210	5,050	1,690
Reduced Materials Expenditures	499	2,241	1,083
Health Benefits	2,211	10,548	4,993
Increased Crop Yields	737	1,247	879
Total	16,130	27,241	19,546

Results from modeling all the categories are slightly different from the sum of results from modeling each category one at a time because of nonlinearity of the REMI model.

### Job Impacts by Industry

Table 4-2 shows the average annual job impact by industry between 1997 and 2010 and with respect to the years 2000 and 2010. The service-producing sectors (SICs 40-89) could experience an additional 8,266 jobs forgone annually, on average. Of the entire

**TABLE 4-2**  
**Draft 1997 AQMP Employment Impacts by Industry**  
**for Quantified Measures and Benefits**

Industry	SIC	2000		2010		Average Annual (1997-2010)	
		jobs	% of Baseline	jobs	% of Baseline	jobs	% of Baseline
Private Sector	01-89	4548	0.06	17822	0.19	9580	0.12
Goods-Producing	01-39	749	0.05	1378	0.09	1314	0.09
Farm	01-02	670	2.26	1484	5.69	916	3.24
Agricultural Services/Forest/Fish	07-09	-144	-0.19	-114	-0.12	-144	-0.17
Mining	10-14	-16	-0.11	-1	-0.01	-20	-0.14
Construction	15-17	2128	0.60	2845	0.66	2686	0.71
Apparel and Textiles	22-23	-413	-0.41	-413	-0.43	-430	-0.43
Wood Products	244,249,251-3,259	-412	-0.93	-510	-1.23	-451	-1.05
Commercial Printing	275	-122	-0.30	-109	-0.26	-123	-0.30
Petroleum Refining	291	-55	-0.90	-128	-2.96	-116	-2.15
Electrical and Electronic	36	-238	-0.34	-193	-0.31	89	0.13
Aerospace	372,3731,376,381,348	1417	0.80	494	0.32	906	0.52
Other Goods Producing		-2066	-0.34	-1977	-0.34	-1998	-0.34
Service-Producing	40-89	3799	0.06	16444	0.21	8266	0.12
Local and Inter-urban Transit	41	28576	131.62	26911	112.98	28396	128.13
Water and Transportation	44	-31	-0.27	-48	-0.35	-43	-0.35
Water and Sanitation Districts	494-497,@493	-10	-0.08	83	0.48	19	0.13
Wholesale Trade	50-51	-1287	-0.26	-1529	-0.28	-1490	-0.29
Restaurants	58	-1911	-0.41	-189	-0.04	-1342	-0.27
Other Retail Trade	52-7,59	-5135	-0.57	-4115	-0.42	-5025	-0.54
Finance, Insurance Real Estate	60-67	-2913	-0.37	-770	-0.09	-2130	-0.26
Drycleaners and Shoe Repair	721,725	-171	-0.32	-63	-0.09	-132	-0.23
Auto Repair, Parking, & Services	752-754	-6	0.00	2907	1.51	1130	0.75
Motion Pictures	781-783	-294	-0.20	-352	-0.20	-337	-0.22
Health Services	80	-4318	-0.69	-999	-0.12	-2957	-0.42
Other Service Producing		-8700	-0.34	-5392	-0.16	-7823	-0.28
Public Sector	91-97	11583	1.29	9418	0.87	9966	1.03
<b>TOTAL</b>		<b>16131</b>	<b>0.19</b>	<b>27240</b>	<b>0.26</b>	<b>19546</b>	<b>0.21</b>

@=part of

service-producing sector, the local and inter-urban transit sector (SIC 41) will have the most jobs created (28,396) mainly due to control measure TCM-01, while the majority of jobs forgone will be in the retail trade (SICs 52-57, 59) sector and other service producing sector with 5,025 and 7,823 jobs forgone, respectively. The jobs forgone in the retail trade and other service producing sectors are mainly due to a reduction in consumer purchasing power as a result of funding of the transportation improvement projects and on-road measures. In addition, the jobs forgone in the health services sector (SIC 80) are mainly due to the reduced health related expenditures to the

medical sector as a result of improved air quality. The goods-producing sectors (SICs 01-39) could have an additional 1,314 jobs created annually, on average, with the largest gains in the construction sector (2,686) due to control measure TCM-01. Appendix D has the distribution of job impacts by three- and four-digit SIC industry.

The quantified measures and benefits of the draft Plan are projected to create 9,966 jobs annually, on average, in the public (or government) sector (SICs 91-97). The majority of these jobs created could be attributed to control measure TCM-01.

### **Small Business Effects**

The District defines a "small business" in Rule 102 as one which employs 10 or fewer persons and which earns less than \$500,000 in gross annual receipts. In addition to the District's definition of a small business, the federal Small Business Administration (SBA), the federal Clean Air Act Amendments of 1990 (CAAA), and the California Department of Health Services (DHS) also provide their own definitions of a small business. Two common characteristics of the SBA, CAAA, and DHS small business definitions are the following: (1) standards are unique to each industry type, and (2) the businesses have to be independently owned and operated, and cannot be dominant in their field.

The SBA's definition of a small business uses the criterion of either gross annual receipts (ranging from \$0.5 million to \$17 million, depending on industry type) or number of employees (ranging from 100 to 1,500). The CAAA classifies a facility as a "small business stationary source" if it (1) employs 100 or fewer employees, (2) does not emit more than 10 tons per year of either ROG or NO<sub>x</sub>, and (3) is a small business as defined by SBA. The DHS definition of a small business uses an annual gross receipt criterion (ranging from \$1 million to \$9.5 million, depending on industry type) for non-manufacturing industries and an employment criterion of fewer than 250 employees for manufacturing industries.

Under the SBA's and CAAA's definitions of small business, the AQMP could potentially impact a wide range of small businesses. The number of affected small businesses will be fewer under the AQMD's definition. To analyze the employment impacts on small business, the employment impact by industry is reconfigured to highlight those industries that are generally dominated by small businesses. The expansion of the REMI model from 53 to 214 sectors facilitated the examination of job impacts for small business industries that include the wood products, commercial printing, and restaurant sectors (Table 4-2). The jobs forgone in these industries are at most about 1.5 percent of the baseline projected employment for these industries. Additional analyses of the number and types of small businesses affected by each control measure will be performed during the individual rule development processes.

## PROJECTED JOB IMPACTS FROM UNQUANTIFIED MEASURES

Table 4-3 shows the projected job impacts from the unquantified measures. The projection is performed by applying the relationship between the average annual cost and job impacts of the quantified measures (excluding TCM-01) to the projected cost of unquantified measures, as discussed in Chapter 3. The unquantified measures are projected to result in 2,264 jobs forgone annually, on average. The job impacts here should be interpreted cautiously. First, the relationship between cost and job impacts is not linear. Second, costs of measures are strongly related to how these measures are implemented. Since the job projection is based on the cost projection, any uncertainty in the latter will be carried over to that of the former. When one includes the projected job impacts of the unquantified measures, the total job impact of the draft 1997 AQMP is estimated to be 17,282 jobs created annually, on average. This projection must be considered in the context of the baseline job projection without the draft 1997 AQMP, which is estimated to be 10.3 million jobs in 2010 in the four-county area.

The projection of jobs created from the draft 1997 Plan is a result of quantifying a much larger portion of the draft 1997 AQMP measures and lower costs per ton of pollutant reduced from quantified measures than was the case with the 1994 and earlier Plans. The lower costs significantly reduce the projected costs of unquantified measures, thereby the projected jobs forgone. Overall, the increased number of quantified measures reduces the uncertainty of unquantified measures.

**TABLE 4-3**

Total Job Impacts of the Draft Plan

Quantified/Unquantified/Total	Average Annual (1997-2010)	Percent of Total Jobs in 2010
Quantified Measures and Benefits	+19,546	+0.19
Unquantified Measures	-2,264	-0.02
Total	+17,282	+0.17

## SUMMARY

Without the AQMP, jobs in the four-county area are projected to grow at an annual rate of about 2.035 percent between 1993 and 2010. With the draft Plan, jobs will grow by 2.05 percent annually or an increase of 0.015 percent per year, as shown in Table 4-4. The four-county region is projected to have 10.3 million jobs in 2010. The job impact of the draft Plan is less than 0.2 percent of total jobs in 2010.

**TABLE 4-4**  
 Job Growth With and Without the Draft 1997 AQMP

Year	without AQMP	with AQMP
1993	7,339,861	7,339,861
2010	10,338,330	10,363,306
Annual Growth Rate (1993 - 2010)	2.035%	2.050%

Considering quantified measures and benefits only, the projected jobs forgone for industries with relatively higher concentration of small businesses is at most about 1.5 percent of the baseline projected employment for these industries. The small business impact of individual control measures will be examined in the rule development process. The employment impact associated with unquantified measures will be examined further as costs of these measures are developed. In addition, as these measures are developed into rules, their potential employment impacts will be specifically assessed. Chapter 8 has a more detailed description of these future assessments.