CHAPTER 5

IMPACTS ON ETHNIC AND ECONOMIC GROUPS AND COMMUNITIES

INTRODUCTION

Socioeconomic issues have become increasingly important in recent years during the development of air quality regulations and policies. Evaluation of the distribution of job and cost impacts among ethnic and economic groups, and among geographic communities is a key topic to be considered.

While a socioeconomic assessment provides valuable information regarding the potential direct and secondary effects, the analysis does have some limitations. Establishing appropriate methods to estimate distribution effects is difficult because the socioeconomic assessment in the air pollution area is a relatively new field. Few analytical models exist that can be easily adapted to air quality policy analysis. Moreover, there is an inherent bias because costs tend to be more easily measured than benefits. Finally, there are additional uncertainties associated with examining subpopulations within the four-county area. Overall, socioeconomic assessments require substantially more data than what currently exists because existing data are often limited or based on small samples, thereby making estimates less reliable.

It is not possible at this time to quantify the costs associated with every control measure or the benefits associated with every effect of clean air. Of the 45 control measures considered for emission reductions, 28 have quantifiable costs. Costs for the other measures are not available at this time because control methods, control efficiencies, emission reductions, or costs of control technologies are not presently known. The REMI model, used to analyze potential impacts of the draft 1997 AQMP, projects possible impacts on jobs, the distribution of jobs, income, and product prices based upon the input of cost data for the quantified control measures and benefit data for each quantified effect of clean air. The reliability of such projections is dependent upon the validity of the input. The District staff believes that it would be inappropriate to make assumptions relative to job impacts on ethnic groups for unquantified measures and benefits. The analysis contained herein, therefore, considers only those measures and benefits for which quantification is available.

HEALTH BENEFITS BY SUB-AREA AND ETHNICITY

The four-county area is projected to attain the federal PM10 standard in 2006 and the federal ozone standard in 2010. The quantified health benefits from reductions in PM10 and ozone are expected to reach $904 million in 2010. Air quality benefits occur throughout the Basin. When compared with the baseline "no control" scenario, the Inland Empire shows the greatest reduction in PM10 and ozone concentration.

The Urban Airshed Model and the PM10 model provide air quality projections for each 5 x 5 kilometer grid cell within the Basin. The air quality projections and the population projections by age cohort, gender, and ethnicity in each grid cell allow an examination of the distribution of the quantified health benefits at the grid cell level, which is then aggregated to 18 sub-areas. Excluded from the distribution are the two off-shore islands, i.e., Catalina and San Clemente. Table 5-1 shows, among the 18 sub-areas (refer to Figure 2-5 in Chapter 2 for a geographic distribution of the sub-areas), the distribution of quantified health benefits in terms of

reductions in premature mortality and morbidity resulting from PM10 and ozone reductions in 2010. Ninety-one percent of the health benefits in 2010 can be attributed to PM10 reduction. The distribution of the health benefits for the benchmark years 2000 and 2006 among the 18 sub-areas is similar to that for the year 2010. Since mortality and morbidity benefits are strongly related to PM10 emissions, the major benefit occurs in those areas with greater PM10 reductions.

The majority of the quantified health benefits projected for 2010 occur in the area around the northwest of the Riverside County (42 percent) and the Chino-Redlands area (50 percent). Among ethnic groups, Hispanics are estimated to receive the highest share (47 percent) of the projected health benefit, followed by Whites (38 percent), African Americans (8 percent), and Asians and Others (7 percent). In the years 2000 and 2006, Whites are projected to receive slightly higher shares of the health benefit (45 and 42 percent, respectively) than the year 2010.

TABLE 5-1

Quantified Health Benefits in 2010 by Sub-area and Ethnicity

Sub-areas	Whites	African Americans	Hispanics	Asians & Others	All
LA CO Burbank	0.14%	0.01%	0.24%	0.06%	0.45%
LA CO San Fernando	0.10%	0.01%	0.07%	0.01%	0.20%
LA CO West	0.11%	0.01%	0.58%	0.08%	0.78%
LA CO Central	0.10%	0.02%	0.05%	0.02%	0.19%
LA CO South Central	0.23%	0.20%	0.58%	0.46%	1.46%
LA CO South	0.38%	0.05%	1.00%	0.40%	1.83%
LA CO East	0.09%	0.03%	0.94%	0.21%	1.27%
LA CO Southeast	0.00%	0.11%	0.25%	0.01%	0.38%
LA CO Beach	0.19%	0.05%	0.20%	0.07%	0.50%
LA CO North	0.02%	0.00%	0.01%	0.01%	0.05%
ORANGE CO North	0.08%	0.01%	0.13%	0.05%	0.27%
ORANGE CO Central	0.10%	0.00%	0.07%	0.04%	0.21%
ORANGE CO South	0.04%	0.00%	0.01%	0.01%	0.06%
ORANGE CO West	0.04%	0.00%	0.01%	0.01%	0.07%
Northwest Riverside CO	20.00%	2.75%	16.08%	2.70%	41.54%
Other Riverside CO	0.28%	0.02%	0.21%	0.02%	0.54%
Chino-Redlands	16.32%	4.58%	26.37%	2.72%	49.99%
Other San Bernardino CO	0.15%	0.01%	0.05%	0.01%	0.21%
Total	38.38%	7.87%	46.86%	6.90%	100.00%

COSTS BY SUB-AREA

The draft 1997 AQMP requires emission reductions from stationary, on-road, and off-road sources. Emission reductions from stationary sources consist of those from permitted (point) and non-permitted (area) sources. Projected emission reductions in 2010 from all these sources were assigned to a 5 x 5 kilometer grid cell for each quantified measure. Excluded from the allocation of emission reductions are 58 facilities of which 19 had incorrect UTM (Universal Transverse Mercator) coordinates and could not, therefore, be accurately plotted. The other 39 are rental equipment facilities. Emission reductions from off-road sources on the two off-shore islands, i.e., Catalina and San Clemente, were also excluded from the allocation.

The emission reductions for each quantified measure in each grid were then aggregated to a total of 18 sub-areas. The average annual cost during the implementation period of each quantified measure was then allocated to each sub-area according to its proportion of emission reductions.[1] As described in chapter 3, the average annual costs of all quantified measures from 1997 to 2010 are projected to be $1.6 billion. The costs are distributed among industries, consumers, and governments.

Table 5-2 shows the projected cost share in each sub-area for all the quantified control measures by source categories. The Los Angeles County East area (San Gabriel Valley) and the Chino-Redlands area in the San Bernardino County have relatively higher shares (11 percent) of the costs of stationary control measures. The San Gabriel Valley and the Los Angeles County North area have relatively higher shares (around 11 percent) of on-road control costs. The Orange County West (coastal communities from Seal Beach to Newport Beach) and the other San Bernardino County areas have relatively higher shares (13 and 14 percent, respectively) of off-road control costs. In terms of the costs of all quantified measures, the areas which would experience the highest shares are the San Gabriel Valley and the Los Angeles County North area.

[1] The costs of control measures TCM-01, ATT-01, ATT-02, and ATT-05 in each sub-area were developed by using the costs of these measures for individual counties (developed by SCAG) and the proportion of emission reductions of all the sub-areas within a county resulting from the implementation of these four combined measures.

TABLE 5-2

Cost Share by Source Category by Geographic Area
for Quantified Measures

Sub-areas	Source Category			Total
	Stationary	On-road	Off-road	
LA CO Burbank	3.3%	5.3%	1.9%	5.1%
LA CO San Fernando	7.0%	4.9%	3.7%	5.1%
LA CO West	4.8%	4.8%	9.1%	4.9%
LA CO Central	8.6%	9.7%	7.1%	9.6%
LA CO South Central	5.2%	4.8%	2.1%	4.8%
LA CO South	3.1%	3.8%	6.9%	3.8%
LA CO East	11.0%	11.6%	7.9%	11.5%
LA CO Southeast	9.5%	9.2%	6.1%	9.2%
LA CO Beach	6.0%	7.3%	5.3%	7.2%
LA CO North	2.6%	11.3%	1.4%	10.5%
ORANGE CO North	3.0%	0.9%	1.8%	1.1%
ORANGE CO Central	4.6%	2.0%	4.0%	2.3%
ORANGE CO South	6.0%	7.0%	7.2%	6.9%
ORANGE CO West	5.3%	1.6%	12.7%	2.0%
Northwest Riverside CO	3.3%	4.3%	1.0%	4.2%
Other Riverside CO	3.9%	1.7%	2.7%	1.8%
Chino-Redlands	11.1%	9.2%	4.2%	9.3%
Other San Bernardino CO	1.7%	0.5%	14.2%	0.7%
Total	100.0%	100.0%	99.4%	100.0%

*The total percentage does not add to 100% because of the exclusion of off-road sources on the islands of Catalina and San Clemente.

JOB IMPACTS BY COUNTY

The total projected employment for Los Angeles County in 2010 is 6.091 million jobs without the draft 1997 AQMP. Orange County is projected to have 2.272 million jobs in that year. Riverside and San Bernardino counties are projected to have 0.88 and 1.095 million jobs in 2010, respectively.

The entire four-county area is projected to have an annual increase of 19,546 jobs between 1997 and 2010 (Chapter 4) from quantified measures and benefits, All the counties are expected to have jobs created. Los Angeles and Orange counties are projected to have a 56 percent share of the total jobs created. Table 5-3 shows the distribution of projected job impacts by county for the years 2000 and 2010, and the average annual projected job impact between 1997 and 2010. The share of jobs created in each county in 2010 relative to the total projected employment in that county ranges from 0.1 percent for Los Angeles County to 1.03 percent for Riverside County.

TABLE 5-3

Job Impacts by County
for Quantified Measures and Benefits

County	2000	2010	Average (1997-2010)
Los Angeles	10,083	6,107	7,812
Orange	1,223	4,762	3,103
Riverside	2,619	9,096	4,731
San Bernardino	2,205	7,277	3,900
Total	16,130	27,241	19,546

JOB IMPACTS BY ETHNICITY

The job impacts discussed in this report represent the net change to the employment trend of an industry. This net change includes a mixture of new hires, layoffs/attrition from the existing work force, and a slowdown in projected job growth. When new hires are greater than layoffs, more jobs will be created. When the reverse is true, there will be jobs forgone. A dynamic economy must undergo such changes in order to grow and adjust to new conditions. These changes can increase productivity and promote greater competitiveness. Furthermore, these changes in the context of the draft 1997 AQMP are necessary to improve the environment, which generates enormous benefits for the public.

The findings from an extensive literature review (Kletzer and Ong, 1994) as well as the Current Population Survey indicate that the chances of being displaced from a job are higher for African Americans and Hispanics than for non-Hispanic Whites and Asians. In addition, the re-employment rates are lower for African Americans and Hispanics than for Asians and non-Hispanic Whites. To account for that disparity this report makes adjustments, as necessary, to the information provided by the 1990 Census data on the distribution of jobs by ethnicity in a given 2-digit SIC industry. The adjusted distributions were used for only those industries which show jobs forgone for the first five years of the draft 1997 AQMP, since much of the near-term impacts may be generated through a combination of forgone growth and layoffs. The impacts in the more distant future tend to be deviations from projected job growth.

Table 5-4 shows the distribution of job impacts by industry and ethnicity. Between 1997 and 2001, it is projected that an average of 22,593 jobs will be created annually. The projections indicate that during that time period, Whites will have a 57 percent share of the average annual jobs gained, followed by Hispanics (18 percent), African Americans (16 percent), and Asians (8 percent). Between 2002 and 2010, an additional 17,854 jobs will be created per year, on average. During this period, the share of jobs created for Hispanics and African Americans will increase to 20 and 21 percent, respectively.

TABLE 5-4

Draft 1997 AQMP Employment Impacts by Ethnicity
for Quantified Measures and Benefits

Industry (SIC)	1997-2001						2002-2010					
	White	African American	Asian	Hispanic	Other	Average Annual	White	African American	Asian	Hispanic	Other	Average Annual
Agriculture (01-09)	111	9	23	218	1	362	306	25	63	603	4	1000
Mining (10-14)	-10	-2	0	-4	0	-17	-14	-2	-1	-5	0	-21
Construction (15-17)	1451	89	108	903	17	2568	1554	96	116	968	19	2751
Nondurable Mfg. (20-30,ex 24,25)	-506	-77	-106	-811	-10	-1510	-758	-81	-186	-1005	-10	-2041
Durable Mfg. (24,25,32-39)	572	62	109	406	7	1155	-528	-57	-100	-375	-7	-1067
Transp. & Public Util. (40-49)	15385	3622	2333	6835	258	28433	15003	3532	2276	6666	252	27728
Wholesale Trade (50-51)	-496	-55	-83	-311	-7	-952	-994	-77	-194	-514	-10	-1789
Retail Trade (52-59)	-2898	-404	-522	-2244	-47	-6115	-3322	-323	-702	-2124	-36	-6507
Fin., Insur., Real Est. (60-67)	-1493	-232	-213	-437	-15	-2391	-1302	-141	-218	-315	-9	-1985
Services (70-89)	-5537	-1128	-761	-2704	-86	-10216	-5505	-783	-887	-2221	-58	-9454
Government (91-97)	6363	1801	880	2144	86	11275	5214	1476	722	1757	70	9239
TOTAL	12940	3685	1768	3996	203	22593	9654	3664	887	3435	214	17854

JOB IMPACTS ON HIGH- VERSUS LOW-PAYING JOBS

Occupations were grouped into five categories, lowest to highest, according to median weekly earnings. In the years 2000 and 2010, Groups 2 to 4 are predicted to have slight job growth with the largest job gain to Group 3, as shown in Table 5-5. The projected decline in job growth will slow down for Group 1 by 2010. Group 3 occupations include machinists, mechanics, various types of equipment operators and installers, social and recreational workers, travel agents, health technicians, secretaries, water and waste operators, and construction trade occupations. The occupations in each group are listed in Table B-1 of Appendix B.

TABLE 5-5

Draft 1997 AQMP Employment Impacts by Occupational Wage Group
for Quantified Measures and Benefits

Group	Median Weekly Earnings	% Impact from Baseline 2000	2010	No. of Occupations
1	$187 - $298	-0.31%	-0.06%	19
2	$312 - $380	0.02%	0.08%	19
3	$385 - $510	1.42%	1.24%	20
4	$511 - $643	0.04%	0.13%	20
5	$658 - $1170	-0.01%	0.02%	16

IMPACTS ON DISPOSABLE INCOME

Without the draft 1997 AQMP, real disposable income is projected to grow at an annual rate of 2.60 percent between 1997 and 2010. With the quantified measures and benefits of the draft AQMP, real disposable income is expected to grow by 2.65 percent annually, or an additional 0.05 percent annually. Despite the increase in real disposable income, however, per capita real disposable income would be expected to decrease slightly due to the increased population in the four-county region resulting from the attractiveness of improved air quality. The projected decrease in per capita real disposable income is less than a dollar per year.

IMPACTS ON PRICE INDEX BY INCOME

The REMI model develops price indexes of consumption goods for households in five income groups by comparing prices of those goods between the four-county region and the rest of the United States. The draft 1997 AQMP is projected to result in increases in the price of consumption goods (those goods identified in the annual Consumer Expenditure Survey by the Bureau of Labor Statistics). Table 5-6 shows the projected percentage change in the price of consumption goods by income group for the years 2000 and 2010. The change herein is of the baseline index of consumption goods. The price of consumption goods is projected to increase by less than one percent in 2000 and by about one-quarter of one percent in 2010 across all income groups. For example, given a baseline index of consumption goods of 3 percent, the effect of quantified measures and benefits is projected to bring the index to 3.03 percent, at a maximum. The projected increase in the price is due to the pass-through of additional control costs by industries that are affected by a number of control measures.

TABLE 5-6

Draft 1997 AQMP Impacts on the Price of Consumption Goods
for Quantified Measures and Benefits
(percent of baseline)

Group	2000	2010
1st Quintile	0.93%	0.25%
2nd Quintile	0.93%	0.25%
3rd Quintile	0.91%	0.24%
4th Quintile	0.90%	0.24%
5th Quintile	0.90%	0.23%

SUMMARY

Implementation of the draft 1997 AQMP is projected to result in air quality improvements sufficient to attain the air quality standards by 2010 throughout the Basin. The modeling has, however, shown the greatest relative improvements and air quality benefit in the eastern portion of the Basin. A demographic analysis has identified a high concentration of Hispanics expected in that area by 2010. The Hispanic population is consequently expected to benefit extensively from the draft Plan.

The attainment of the air quality standards in 2010 depends on a full implementation of control measures, as proposed in the draft 1997 AQMP. The costs of these measures will spread throughout various communities. The eastern and northern portions of Los Angeles County are projected to have a relatively higher share of the costs than the rest of the communities.

All the four counties are projected to have additional jobs created from quantified measures and benefits. Based on the analysis of quantified measures and benefits presented herein, all the ethnic groups are expected to have a net job gain. Hispanics and African Americans are expected to have a higher share of the projected job gains from 2002 to 2010 than during the period of 1997 to 2001. On the other hand, there is no significant difference in impacts expected for high- versus low-paying jobs. The similar pattern is also observed for the projected impact on the price of consumption goods from one income group to another. These findings are only preliminary and require further evaluation during individual rule adoption hearings.

Implementation of the unquantified measures could result in employment impacts on ethnic groups. A detailed analysis cannot, however, be performed on unquantified measures until they are fully quantified relative to their costs. The distribution of job impacts on ethnic groups resulting from quantified measures and benefits needs to be further explored at the county level with the use of additional data bases. The District will further examine these issues in future efforts.

Additional surveys on affected groups and communities need to be developed to better understand the detailed job impacts. Furthermore, tools need to be developed relative to presenting socioeconomic and air quality data geographically. Chapter 8 has a more detailed description of these proposed future enhancements to the socioeconomic analysis.