

Housing Portland's Families

**A Background Report for a Workshop in Portland, Oregon, July 26,
2001, Sponsored by the National Housing Conference**

by

Barry Edmonston and Risa Proehl

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EXECUTIVE SUMMARY

More than 60,000 families in metropolitan Portland, or more than 9 percent, have critical housing needs. Many of these families are working families, with about two-thirds of them having moderate or low employment income.

This report offers new analysis for metropolitan Portland, primarily based on the U.S. Census Bureau's American Housing Survey, for 1986, 1990, and 1995. The analysis replicates results and conclusions in *Housing America's Working Families*, a national report released in June 2000 by the National Housing Conference's research affiliate, the Center for Housing Policy. The national report cites American Housing data for 17 metropolitan areas in 1998, but does not include Portland because Portland was not included in the 1998 sample.

About 19,000 working families, those whose total household income is more than the minimum wage but less than 120 percent of metropolitan Portland's median income (about \$9,600 to \$51,200 in 1995) and who earned at least half of their income through employment, have critical housing needs.

Most working families with critical housing needs find themselves spending more than half of their income on housing. In addition, there is a smaller proportion of working families with critical housing needs who have severely inadequate housing (about 15 percent of all families with critical housing needs), including major deficiencies in the quality of their housing unit.

The results of this study point to three policy implications. First, there are important housing needs for moderate-income working families in metropolitan Portland. The poor are not the only group who need affordable and adequate housing. Second, the conditions associated with critical housing needs for working families vary greatly. Although metropolitan Portland appears to have lower levels of critical housing needs than many other metropolitan areas, there are substantial numbers of families, but with diverse characteristics. Given this diversity, no single program can address all these housing needs. Third, critical housing needs are a combination of available housing (and its cost) and available family income: the problem is not exclusively a supply-side or demand-side issue.

INTRODUCTION

This report presents analysis for critical housing needs for the metropolitan Portland-Vancouver area, including five counties in Oregon (Clackamas, Columbia, Multnomah, Washington, Yamhill) and one in Washington (Clark). The results replicate a national study by the National Housing Conference's research affiliate, the Center for Housing Policy, entitled *Housing America's Working Families* published in June 2000, that examined critical housing problems for the nation's moderate working families; it did not include analysis of housing needs for Portland because Portland was not included in the survey data.

This report, like *Housing America's Working Families*, focuses on moderate-income working families,¹ a segment of the population that is often neglected in current housing policy debates.

The report includes two main sections. The first section discusses trends in critical housing needs in metropolitan Portland for 1986 to 1995, with a focus on housing needs for working families. The second section reports initial results for analysis of metropolitan Portland and three other areas – Denver, Kansas City, and San Antonio – for 1986, 1990, and 1995. Appendix A includes discussion of population trends in metropolitan Portland. Appendix B describes analysis on selecting metropolitan areas with similar characteristics to Portland.

I. CRITICAL HOUSING NEEDS

Following the *Housing America's Working Families* report, we define critical housing needs as those households in which either:

- the household spends more than one-half its income on housing and/or
- the household lives in a severely inadequate housing unit.

We analyze data collected by the U.S. Census Bureau's American Housing Survey in metropolitan Portland for the three most recent survey years: 1986, 1990, and 1995.²

Families with Critical Housing Needs

Although metropolitan Portland has experienced continued economic progress for the past fifteen years, some families in the area continue to have critical housing needs. In 1995, about 63,000 families, or about one in ten Portland families, have critical housing needs (see Figures 1a and 1b).

American Housing Survey data indicate that the number and proportion of families with critical housing needs decreased from 1986 to 1990 and then increased between 1990 and 1995. Taking the sample size and sample design into account, however, the changes for the 1986 to 1990 and 1990 to 1995 periods are within the range of sampling error.³ Overall, the proportion of families with critical housing needs has varied in the range of about 8 to 10

¹ The U.S. Census Bureau defines a household as one or more persons living in a housing unit. According to Census Bureau definitions, families are a subset of households, defined as persons living together who are related by blood, marriage, or adoption. A married couple is a family; single persons or two unrelated lovers are not. The limitation of this definition for this analysis is that that we want to include single person households. Hence, we include all households in the analysis, including single persons, and refer here to them as "families," a different use of this term that in U.S. Census Bureau report.

² The U.S. Census Bureau conducts the American Housing Survey to collect housing statistics for the U.S. Department of Housing and Urban Development. The survey collects data on apartments, single-family units, mobile homes, and vacant units; on the demographic characteristics of the householders for occupied units; on housing and neighborhood quality; and on equipment and fuels for the housing unit. The survey is typically conducted from August to February with a national sample of about 55,000 interviews. The survey rotates through a list of metropolitan areas, usually collecting survey information for metropolitan Portland about every 5 years. The number of interviews in metropolitan Portland is usually between 3,000 and 5,000.

³ For a sample size of about 4,000 households for metropolitan Portland, the .90 confidence interval for an estimate of 0.1000 is plus or minus .0094, or a confidence interval of .091 to .109. Rounding off, when we observe an estimate of 10 percent for metropolitan Portland, we can be fairly confident that the "true" statistic is between 9 percent and 11 percent.

percent in recent decades. With population growth, the number of families with critical housing needs has gradually increased, to more than 60,000 families at present.

Family Characteristics

The characteristics of Portland families with critical housing needs vary. Of the 63,000 families with critical housing needs in 1995, 69 percent are employed at least marginally. A small number of employed families (under 1,000) have household earnings that are greater than 120 percent of local median income. Most families with critical housing needs were in lower income ranges. About 19,000 families with critical housing needs, or 30 percent of all families with critical housing needs, had incomes between minimum wage and 120 percent of local median income (see figures 2c and 3c).

A large number of working families with critical housing needs are marginally employed. About 24,000 working families with critical housing needs, or 38 percent of all families with critical housing needs, have marginal employment (they have employment income that is between fulltime minimum wage income and one-fourth of fulltime minimum wage income).

Finally, about 19,000 families with critically housing needs in 1995, or 30 percent of all families with critical housing needs, report that they are not working. Further analysis of the “not working” group reveals that more than one-half were employed part-time during the year (they comprise about 16 percent of all families with critical housing needs), but that their total annual employment income was less than one-fourth of fulltime minimum wage income. The remaining group of families, about 14 percent of all families with critical housing needs, reported no employment income during the past year.

1986 to 1995 Trends

From 1986 to 1995, there have been increases in the number and proportion of working families with critical housing needs, including a growth in the number of families with moderate income and families who are marginally employed (see Figure 4). During the same period, there have been decreases in the number and proportion of “not working” families with critical housing needs. The major decreases occurred in the families with critical housing needs who had employment income less than one-fourth fulltime minimum wage income.

Critical Housing Needs and Family Income

Having a job and even working fulltime does not guarantee that a family will have adequate housing at a reasonable cost. With strong employment growth in metropolitan Portland over the past fifteen years and increases in housing costs, it is not surprising that the prevalence of higher housing costs varies strikingly with household income. Figure 5a shows the number of households with critical housing needs by household income, which includes wages and other income, in current dollars, for metropolitan Portland for 1986, 1990, and 1995. Most families with critical housing needs have annual incomes under \$15,000 and virtually all families with critical housing needs have annual incomes under \$50,000.

The proportion of families with critical housing needs increases as annual income decreases (see Figure 5b). More than 20 percent of Portland families with annual household incomes less than \$10,000 have critical housing needs. Relatively speaking, very few families with annual household incomes above \$50,000 have critical housing needs.

Housing Problems for Working Families

We limit attention in this section to working families, only including families with income between minimum wage and 120 percent of local median income and have earned at least half of their income from employment.⁴ This

⁴ Based on these criteria, we include metropolitan Portland households with total incomes of \$6,800 to \$37,400 in 1986, \$8,600 to \$44,500 in 1990, and \$9,600 to \$51,200 in 1995 – designating them “working households” for analysis in this report. We exclude (a) households with either no employment income or with employment income that is less than one-fourth annual fulltime minimum wages, (b) households with income between 25% minimum wage and minimum wage, and (c) households with income that exceed 120 percent of local median income.

definition is used in *Housing America's Working Families* and is made here to insure that our results are comparable with national results.

Inadequate Housing

Although excessive housing costs account for the majority of working families with critical housing needs, there are also families with other housing problems. Based on the interviewer's assessment of the family's housing, housing units are classified in the American Housing Survey as severely inadequate or moderately inadequate. A unit is defined as severely inadequate if it has one or more of the following problems: (a) plumbing – lacking hot water or flush toilet or lacking both bathtub and shower, (b) heating – having been uncomfortably cold for a day or more on more than three occasions or more than for at least six hours, (c) upkeep – have at least five major maintenance problems such as holes in floor or rats, (d) hallways – having four major problems in the public areas such as missing steps and (e) electrical – having no electricity or having three major electrical problems such as exposed wiring.

A unit is defined as moderately inadequate if it has any of the following five problems, but none of the severe problems: (a) plumbing – having toilets break down for three times for six hours or more, (b) heating – having unvented gas, oil, or kerosene heaters as the main heating source, (c) upkeep – having three or more upkeep problems, (d) hallways – have three or more problems in the public areas, and (e) kitchen – lacking a sink, range, or refrigerator.

Relatively few working families in metropolitan Portland area report severely inadequate housing: about 3,000 families, or 1 percent of all working families, reported severely inadequate housing in 1995 (see Figure 6a). An additional 7,000 working families, or about 3 percent of all working families, reported moderately inadequate housing in 1995. Overall, less than 4 percent of all working families reported moderately or severely inadequate in 1995, considerably less than the average of about 8 percent cited in *Housing America's Working Families* for 17 metropolitan areas for 1998.

Of working families with critical housing needs, 15 percent reported severely inadequate housing in 1995 and about 37 percent of all working families with critical housing needs, reported moderately inadequate housing (see Figure 6b). Overall, 52 percent of working families with critical housing needs reported moderately or severely inadequate in 1995.

Housing Costs

Heavy housing costs account for the majority of critical housing needs among working families in metropolitan Portland. More than 87 percent of working families with critical housing needs spend more than half of their income on housing. Two percent both spend more than half of their income on housing costs and reside in a severely inadequate housing unit.

About 58,000 families, or 21 percent of all working families, report that they experienced severe cost burdens in 1995 (see Figures 7a and 7b). The evidence from American Housing Survey data is that the number of severely cost burdened working families decreased from 1986 to 1990 and increased from 1990 to 1996; but the observed changes are in the range of sampling error and it cannot be concluded that there have been significant trends, either up or down. Nevertheless, it is clear that there are a substantial number of working families with severe cost burdens and that the number and proportion have not been decreasing.

Overcrowding

While not included in the definition used here for critical housing needs, a substantial proportion of metropolitan Portland's working families live in overcrowded housing units. We define overcrowding here as having more than one person per room in the housing unit. As shown in Figure 8a, about 6,000 to 7,000 working families in metropolitan Portland live in overcrowded conditions. However, only 1 percent of families with critical housing needs experienced overcrowding living conditions in 1995.

Combining the number of working families with critical housing needs with those living in overcrowded conditions, we estimate that there are more than 26,000 working families in metropolitan Portland in 1995 with some housing problems, or almost 10 percent of all working families (see Figure 8b).

Housing Tenure

Renters in metropolitan Portland account for the majority of families with critical housing needs (see Figure 9a). In 1995, about 11,500 families with critical housing needs were renters. About 8,000 families with critical housing needs were owners, either buying or owning their home. As a share of all working household renters and all working household owners (see Figure 9b), there have been steady increases in the proportion of owners with critical housing needs, increasing from 1.6 percent in 1986 to 2.0 percent in 1990 and to 3.0 percent in 1995. The proportion of renters with critical housing needs has fluctuated, but was over 4 percent in 1995.

From examination of the Census Bureau's American Survey Data for 1996, it is indicated that a higher proportion of renters than homeowners in Multnomah County are severely cost-burdened (see Maps 1a and 1b).

Critical housing needs are not confined to the nation's major cities. For metropolitan Portland, most working families with critical housing needs live in suburban locations (see Figure 10). In 1995, about 7,500 families with critical housing needs lived in the City of Portland; the remaining 12,000 families with critical housing needs lived in suburban areas.

Household Income

Figure 11 illustrates household income composition amongst working families with critical housing needs. About 8 percent of the working families in 1995 had incomes in the range of 80 to 120 percent of the area's median income. Another 20 percent of working households had income in the range of 50 to 80 percent of median income. These two groups comprise more than one-fourth of working families with critical housing needs. The remaining 72 percent of working families had incomes between fulltime minimum wage and 50 percent of median income. These figures for metropolitan Portland for the income composition of working households are similar to those for 17 other metropolitan areas in 1998, cited in *Housing America's Working Families*.

II. FACTORS ASSOCIATED WITH CRITICAL HOUSING

The prevalence of critical housing needs varies markedly for the nation's metropolitan areas. From estimates cited in the *Housing America's Working Families* report, the national average was 14 percent for data collected in 1998. The report also presents estimates for 17 metropolitan areas, with estimates of critical housing needs ranging from 14 percent for Minneapolis-St.Paul to 26 percent for Tampa. Data for metropolitan Portland, with an estimate of almost 10 percent for 1995 indicates that the local metropolitan area has a lower prevalence of critical housing needs than many of the nation's other metropolitan areas.

Selection of Comparable Metropolitan Areas

In this section, we examine factors associated with critical housing needs for metropolitan Portland, and three other areas. We select Portland and three metropolitan areas of similar population size that are included in the American Housing Survey in the 1986, 1990, and 1995 rounds: Denver, Kansas City, Portland, and San Antonio. As noted in Appendix B, if we were to choose several metropolitan areas that closely resemble the population and economic characteristics of metropolitan Portland, our choices would have been Denver, Fort Worth, Minneapolis, Charlotte, and Seattle (in rank order).

Denver closely resembles Portland along five dimensions: age composition, ethnic composition, social indicators, income and employment, and economic structure. Kansas City is not similar to Portland in its overall characteristics; however, it has moderate similarity to Portland in its employment structure. San Antonio resembles Portland in some ways: its age structure and social indicators are moderately similar. But San Antonio has a large Latino population and its employment and economic structure are different from Portland. Overall, Denver is the only metropolitan area in this comparison that has overall demographic and economic characteristics similar to Portland.

Data Sources, Variables, and Methods

Data Sources

For the analysis of critical housing needs, we rely on data from the American Housing Survey. For the four metropolitan areas, there are data on 13,232 households in 1986, 20,485 households in 1990, and 17,102 households in 1995. The overall sample size for the analysis, combining all years for the four metropolitan areas, is 50,819.

We include seven variables in the analysis of factors associated with critical housing needs: age, race, employment status, household composition, household income, housing tenure, and central city-suburb location.

Age

We use dummy variables to code the age of the householder into six categories: under 29 years, 30 to 39 years, 40 to 49 years, 50 to 59 years, 60 to 69 years, and 70 years and older. For the statistical analysis, we exclude the under 29 years age group: the effects of the other age groups are relative to the under 29 years reference group.

Race

We include dummy variables for five race/ethnic groups: white (and non-Hispanic), black, American Indian, Asian or Pacific Islander, and Latino. The number of interviews for some minority groups for some metropolitan areas is very small in some American Housing Survey data; we do not report estimates for these groups when the number of interviews for the race group is less than 10. We define white householders as the reference group for the analysis.

Employment Status

We use definitions similar to those reported in the previous section to define employment status. We use dummy variables to define three groups for the householder: employed, marginally employed, and not employed. We define employed householders as the reference group for the statistical analysis.

Household Composition

We examine the household characteristics and the sex of the householder to define five categories of households: married couples (a married couple with or without others in the household), female householder (an unmarried female head of household with other relatives in the household), male householder (an unmarried male head of household with other relatives in the household), single (a male or female with no others in the household), and other (all other types of households, such as several unrelated roommates in a household). We define married couples as the reference category for the analysis.

Household Income

We include household income, in thousands of dollars, as reported by the household for the previous year. We adjust reported household income to 2000 constant dollars for the analysis of 1986, 1990, and 1995 data.

Housing Tenure

We include dummy variables for owners and renters, using owners as the reference group for the analysis.

Central City-Suburb Location

We include dummy variables for the residential location of the household, using suburb as the reference group.

Statistical Methods

Critical housing needs is coded for each household as 0 for no critical housing needs or 1 for critical housing needs. We use binary logistic regression analysis to examine the relationship between the explanatory variables and the

probability of a household having critical housing needs. We use standard maximum-likelihood methods to estimate the binary logistic regression equation. Although we do not report the statistical results here, we estimate logistic regression equations for each metropolitan area for each of three time periods, or twelve equations in total. We rely particularly on the logistic regression coefficients for interpretation here: all coefficients presented here are statistically significant at the .05 level, based on a one-tailed test.

Trends over Time

The prevalence of critical housing needs varies for the four metropolitan areas and over time. As described earlier, metropolitan Portland has lower levels of families with critical housing needs than the national average. The prevalence of critical housing needs in metropolitan Portland fluctuated from 1986 to 1990, and from 1990 to 1995; however, the changes were within the 90 percent confidence intervals and we do not conclude that there were statistical significance trends over time.

Compared with the levels and trends of critical housing needs for three other metropolitan areas, metropolitan Portland has significantly higher levels than Kansas City in 1986, significantly lower than Denver and San Antonio in 1990, and significantly higher than Denver and Kansas City in 1995. For the other three metropolitan areas, the statistically significant changes were decreases in critical housing needs in Denver and San Antonio between 1990 and 1995.

Year	Denver	Kansas City	Portland	San Antonio
1986	9.9	8.3	9.9	10.2
1990	11.0	7.8	8.3	11.2
1995	7.2	7.5	9.6	9.3

Differences in Explanatory Variables

Metropolitan Portland has distinctive characteristics compared to the three other metropolitan areas under study. Both Denver and Portland have relatively young age distributions for householders, with Portland having an unusually large number of householders who are aged 40 to 49 years. Kansas City and San Antonio have relatively more householders who are 60 years of age and older.

Although Denver, Kansas City, and Portland have ethnic populations that are overwhelmingly white, Denver and Kansas City have minority populations that are principally black while Portland’s minority population is predominantly Latinos and Asians. San Antonio has an ethnic composition that is mainly white and Latino.

The four metropolitan areas do not differ markedly in their employment status: about 60 to 65 percent of householders are employed, about 6 percent are marginally employed, and about 25 to 30 percent are not employed. The observed differences in employment status of householders probably reflect variations in the age composition of the metropolitan populations.

Kansas City and Portland have the highest proportion of households that are comprised of married couples – both metropolitan areas have more than half of households as married couples. Kansas City’s population is distinctive because of the higher proportion of households that are female households or male households. There are minor variations in the proportion of single households, with single persons accounting for about one-third of households in all four areas. Portland’s population includes about twice as many (7 percent) “other” households compared to the other three areas.

Denver has the highest household income (mean of \$56,100 in 1995, using 2000 dollars) with Portland the second highest (mean of \$54,000 in 1995). Kansas City has lower levels of household income (mean of \$50,600). And San Antonio has the lowest levels for these four areas (mean of \$44,900).

Denver, Kansas City, and Portland have similar distributions of housing tenure, with about 60 percent of households owning (or buying their home) and 40 percent renting. San Antonio has lower levels of homeownership, with 55 percent buying and 45 percent renting.

Denver, Kansas City, and Portland have similar divisions of the metropolitan population by central city and suburban residence, with about one-third of the population in the central city and two-thirds in the suburban areas. San Antonio has annexed a large portion of its previously-suburban ring and currently has over two-thirds of its metropolitan population in the central city.

Risk Factors for Critical Housing Needs

Logistic regression analysis reveals a set of common explanatory variables associated with higher levels of critical housing needs. Separate analysis of data for 1986, 1990, and 1995 shows that the important factors have fairly similar associations for each of the three years. There are some noteworthy differences in the relative importance for some factors for each of the four metropolitan areas.

The relative risk of critical housing needs is noticeable higher when the householder is aged 30 to 49 years. This finding is demonstrated for all four metropolitan areas and is evident for each of the three survey years. Relative to other age groups, the risk of critical housing needs diminishes with age, taking all other factors into account.

Race of householder is generally not an important separate risk factor in the analysis of critical housing needs for these four metropolitan areas. There are two exceptions: Latinos in Denver and Asians and Latinos in Portland have higher relative risks of critical housing needs than whites, taking all other factors into account. For Portland, the higher risk for Asians and Latinos may represent the recency of arrival for new immigrant groups.

Householders who are marginally employed or not employed uniformly have a higher risk of critical housing needs than employed householders. This finding is demonstrated for all metropolitan areas for each of the three time periods.

Household income has a strongly negative association with critical housing needs. Increases of about \$10,000 in household income, for all areas, are associated with a reduction of more than one-half in the risk of critical housing needs. The relationship of household income and critical housing needs is similar in 1986, 1990, and 1995 in this analysis.

There are no systematic associations of household composition and critical housing needs in this analysis. Taking other factors into account indicates that the type of household does not have an important and independent association with critical housing needs.

Taking other factors into account, households that are renting have about a 10 percentage point increased risk of having critical housing needs. The relative risk of critical housing needs is somewhat higher for renters; however, there are many owners with critical housing needs and the higher relative risk for renters should not direct attention away for the large number of owners with critical housing needs.

There is no evidence in these survey data that the risk of critical housing needs varies by central city-suburb residence.

Overall, a common set of risk factors emerge in this analysis: householders aged 30 to 49, marginally employed or not employed, low to moderate income, and renter households.

III. CONCLUSIONS

This report highlights housing problems for working families in metropolitan Portland over the past fifteen years. But focusing on working families, the report deliberately attempts to broaden housing debates beyond issues of poverty. The argument made here is *not* that resources should be redirected, certainly not from programs to address poverty, but rather that attention should also be devoted to housing issues for working families.

By examining the critical housing needs for working families in metropolitan Portland, we hope that we make a case of including working families within the framework of affordable housing policy.

Figure 1a.

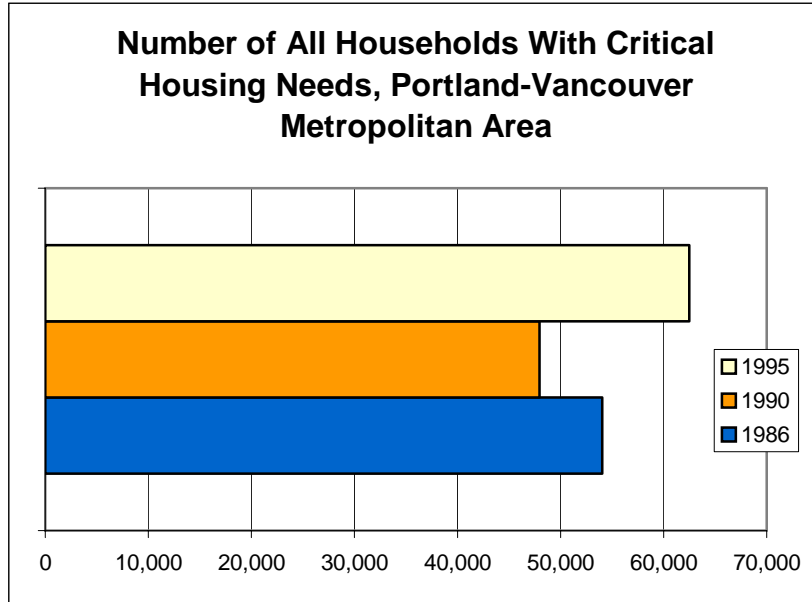


Figure 1b.

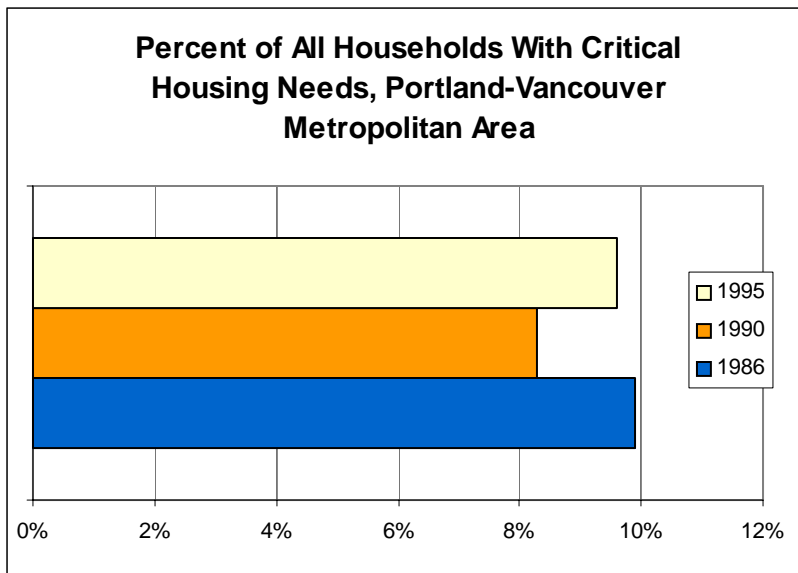


Figure 2a.

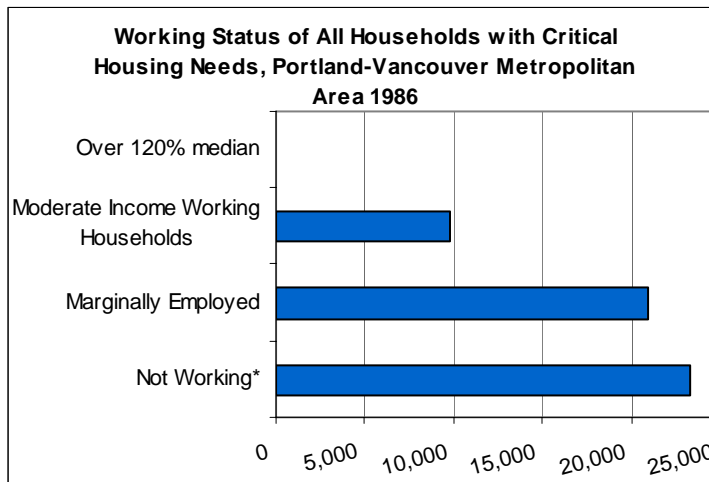


Figure 2b.

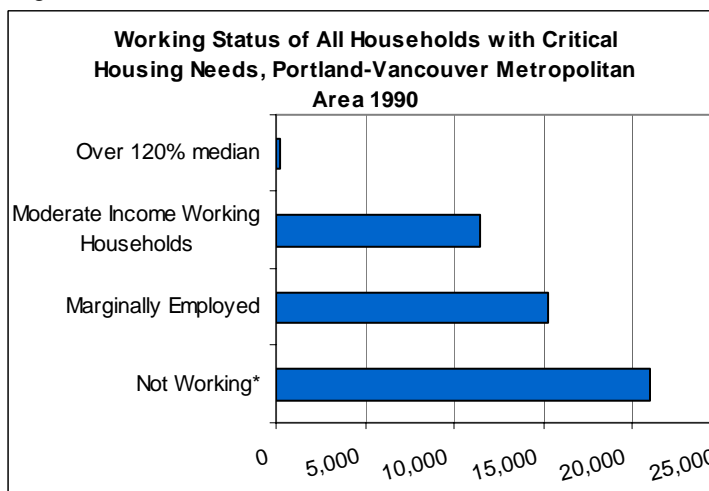
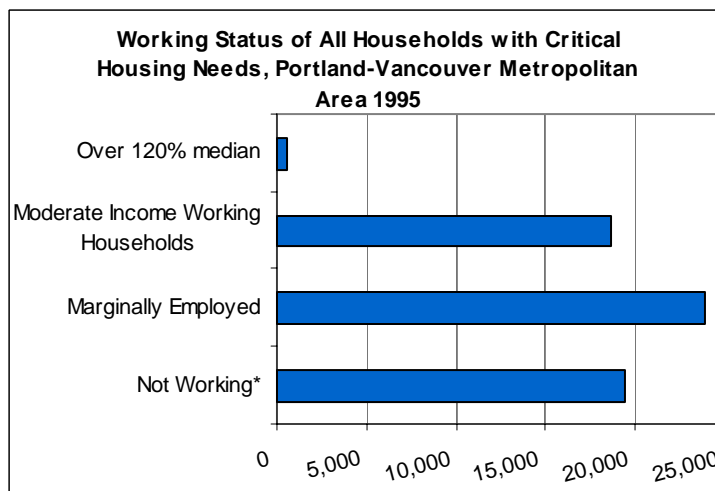


Figure 2c.



*Not Working includes households that earned less than 25% minimum wage.

Figure 3a.

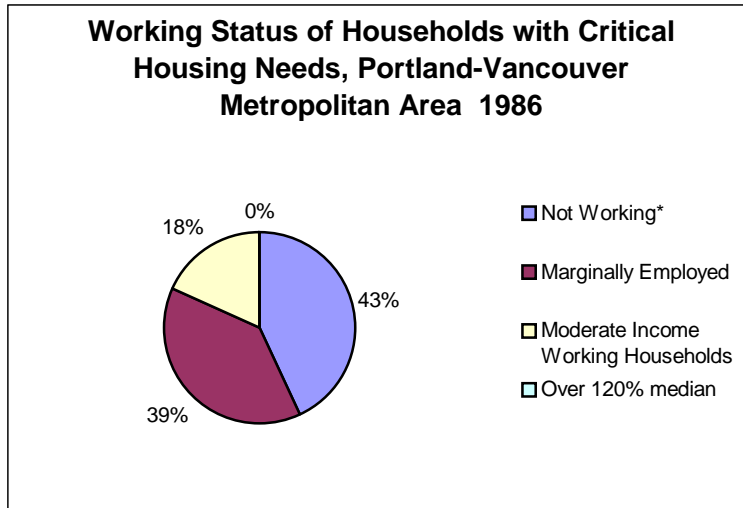


Figure 3b.

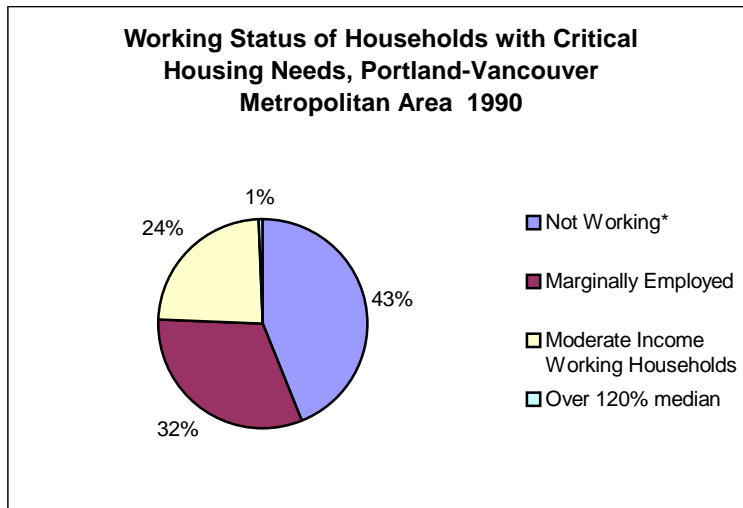
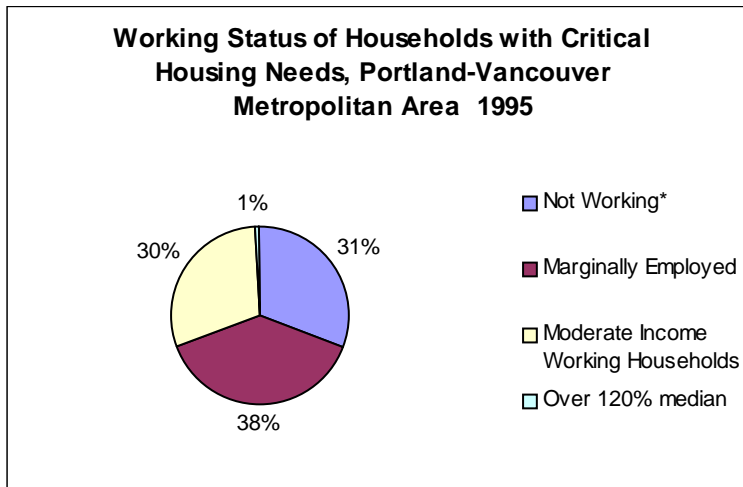
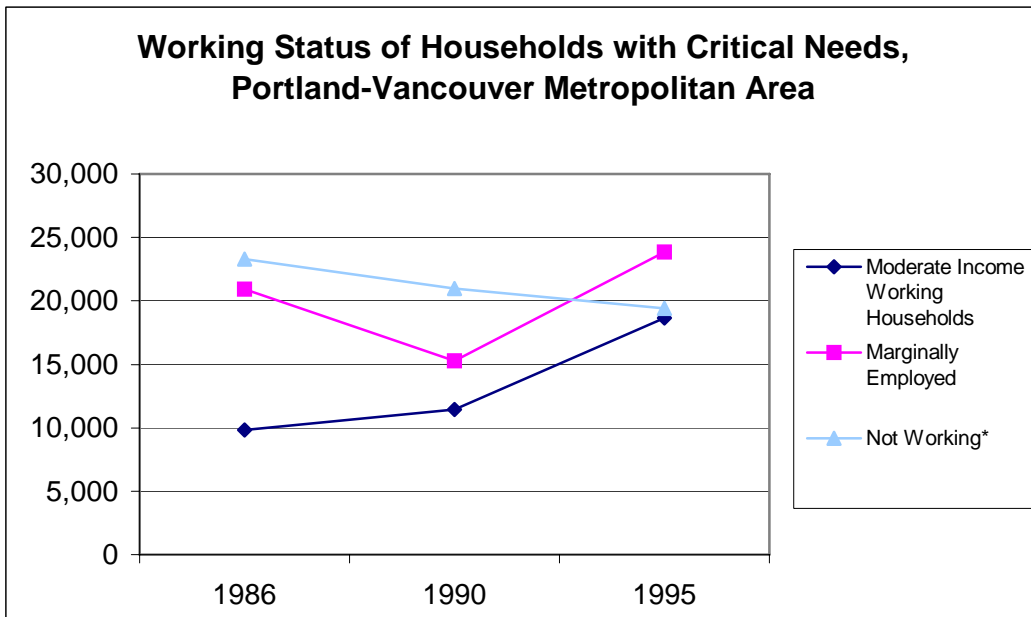


Figure 3c.



*Not Working includes households that earned less than 25% minimum wage.

Figure 4



*Not Working includes households that earned less than 25% minimum wage.

Figure 5a.

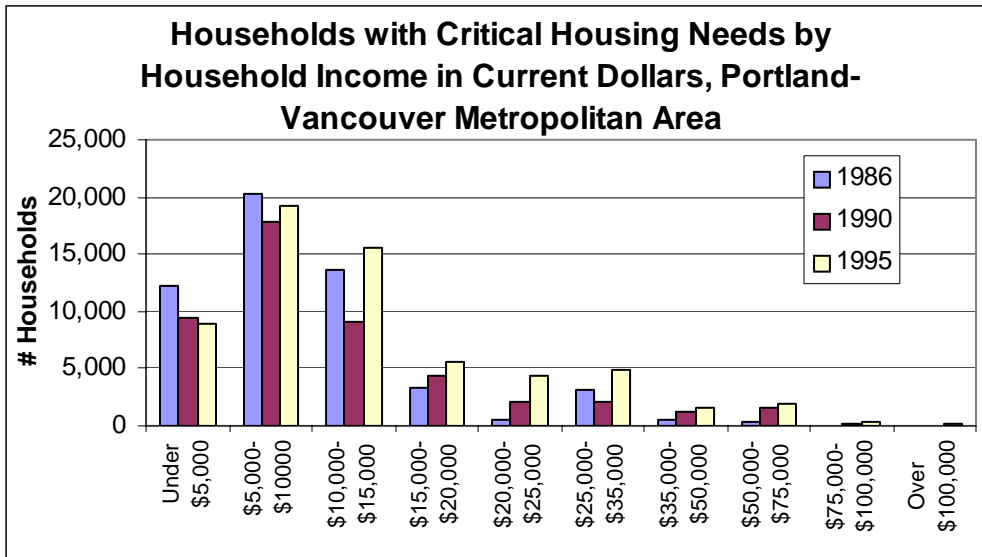


Figure 5b.

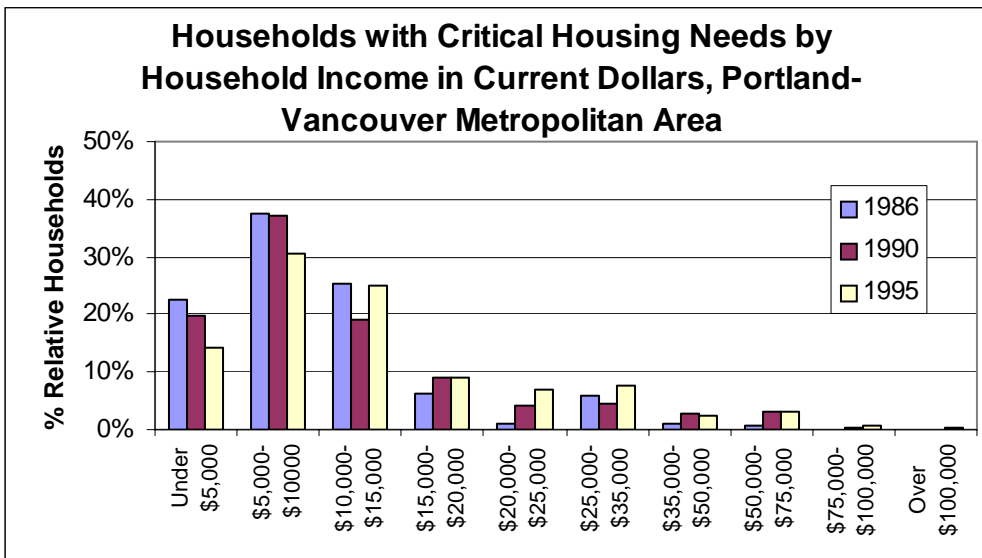


Figure 6a.

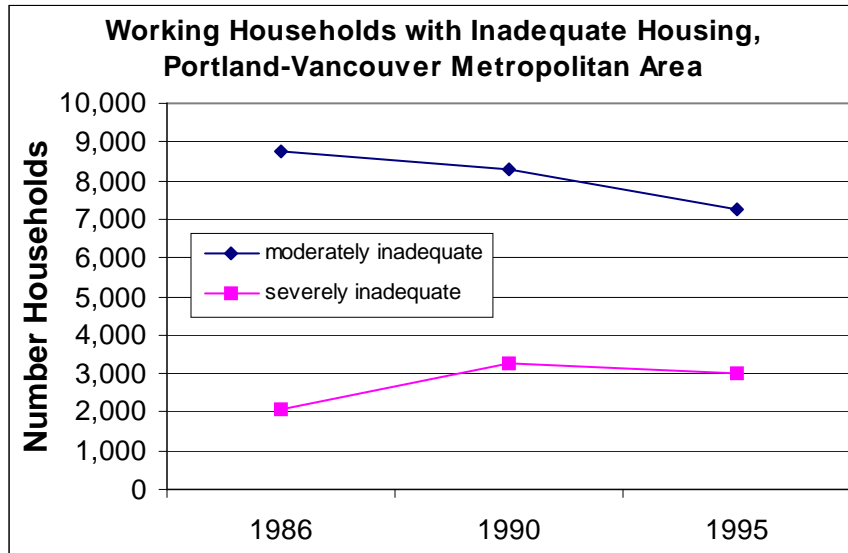


Figure 6b.

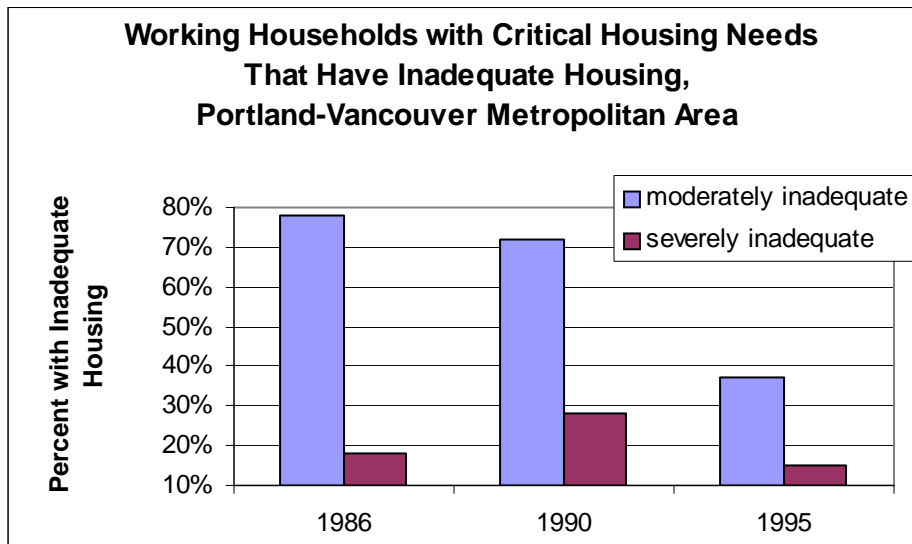


Figure 7a.

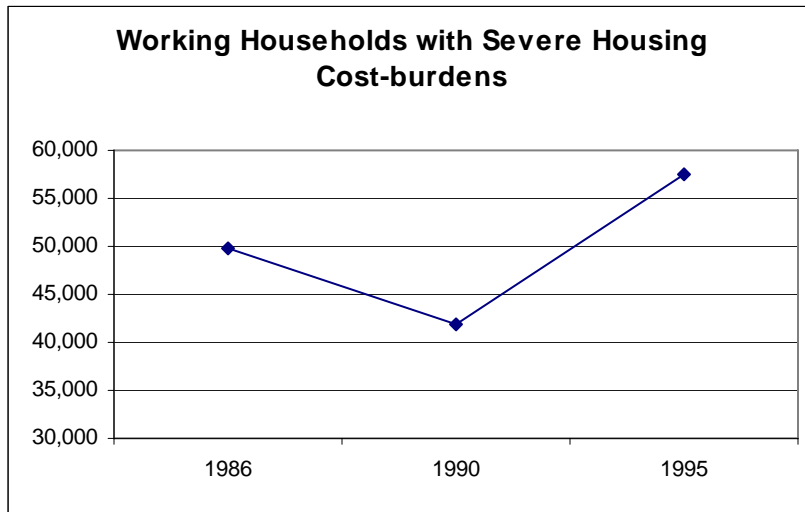


Figure 7b.

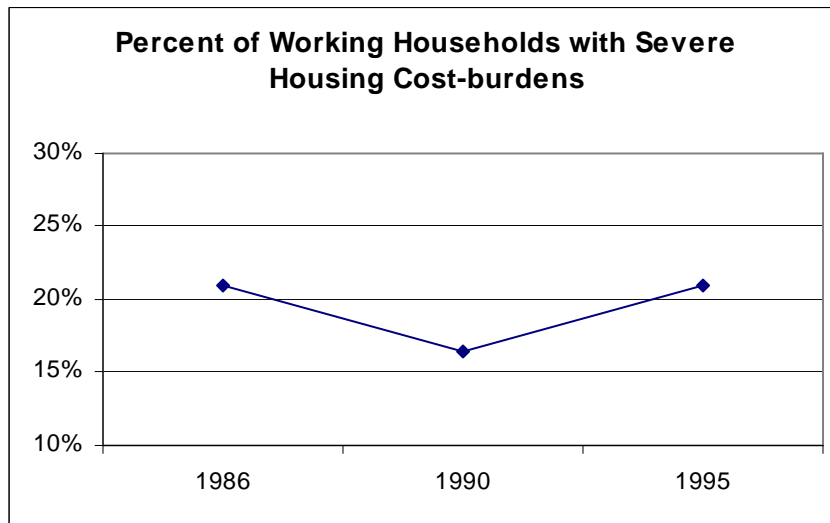


Figure 8a.

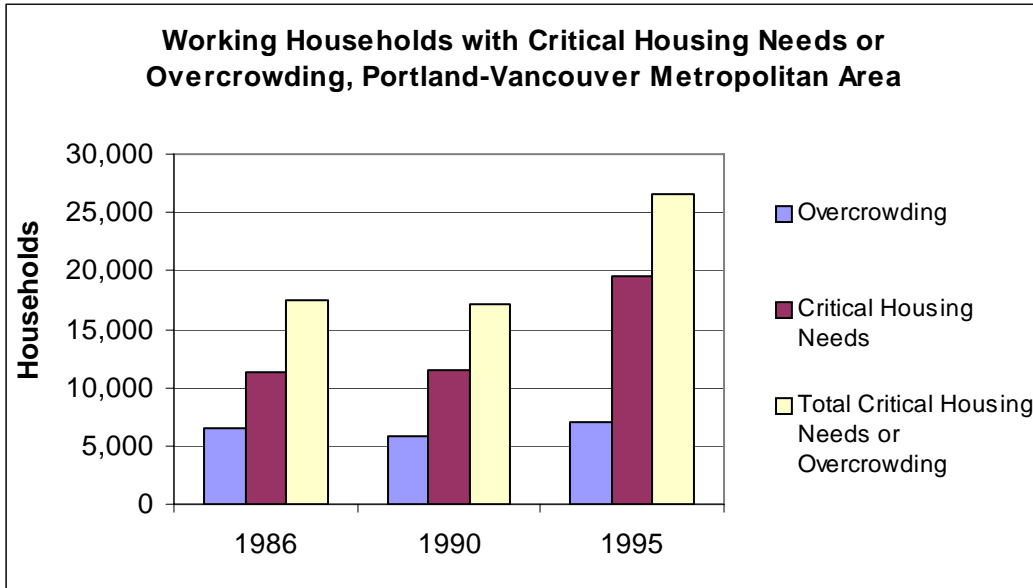


Figure 8b.

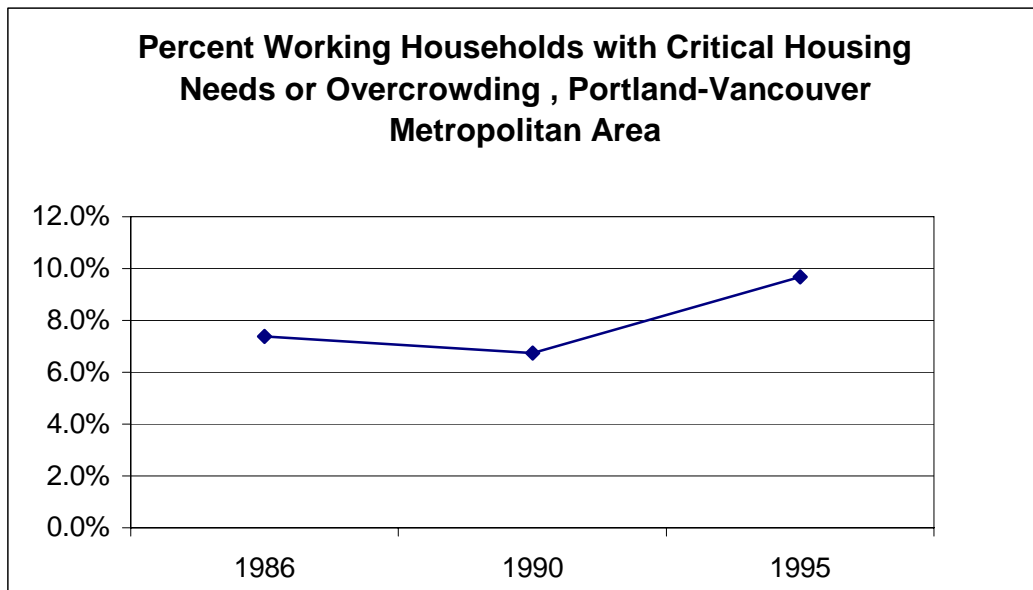


Figure 9a.

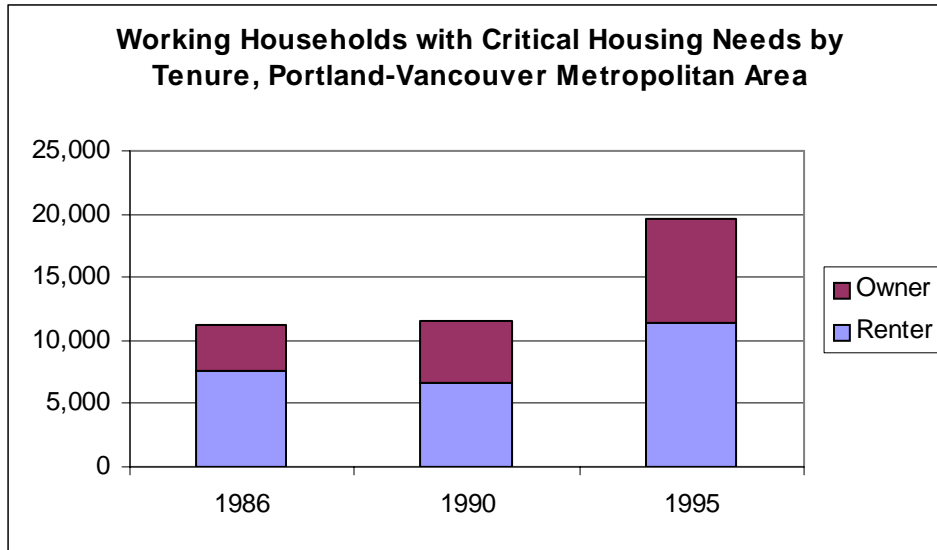
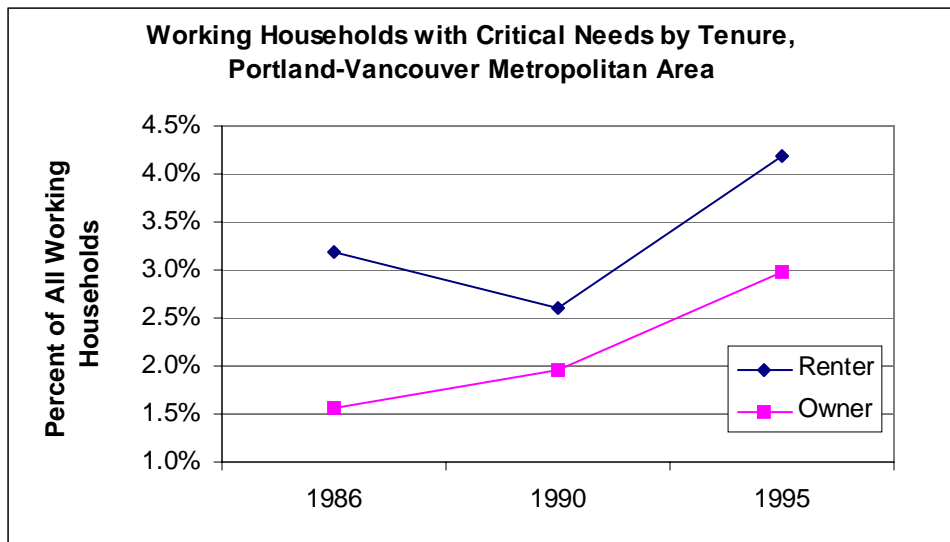
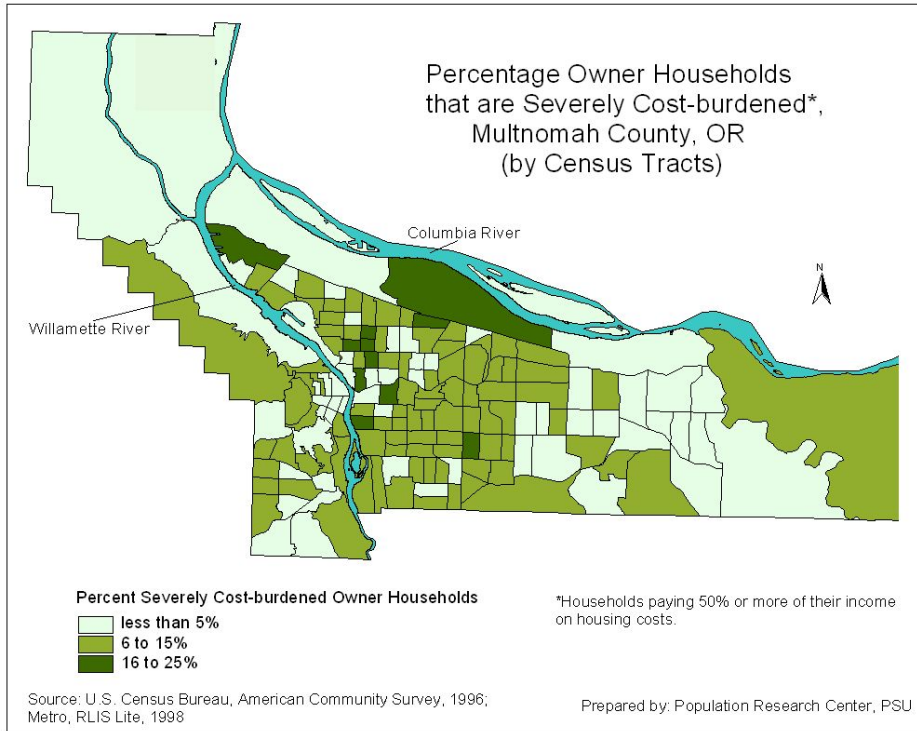


Figure 9b.



Map 1a.



Map 1b.

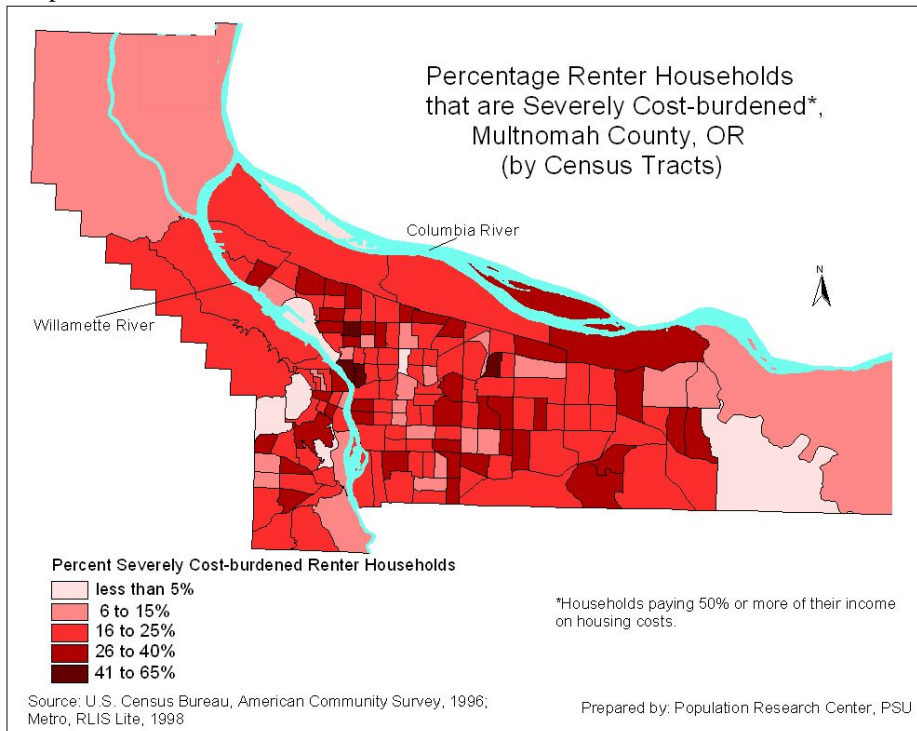


Figure 10.

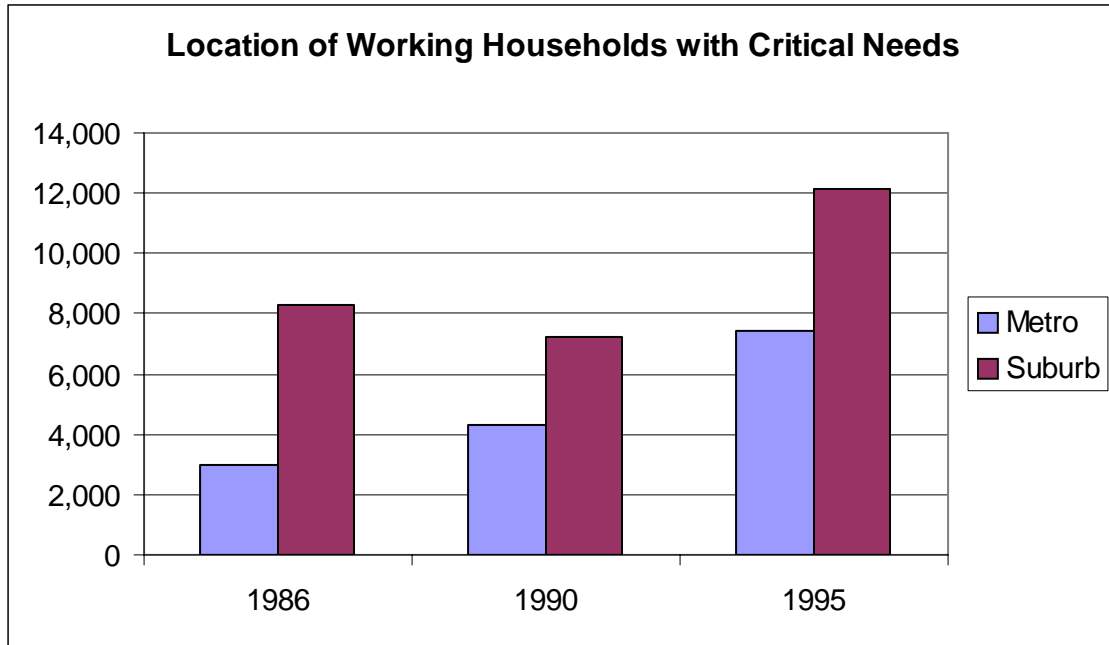
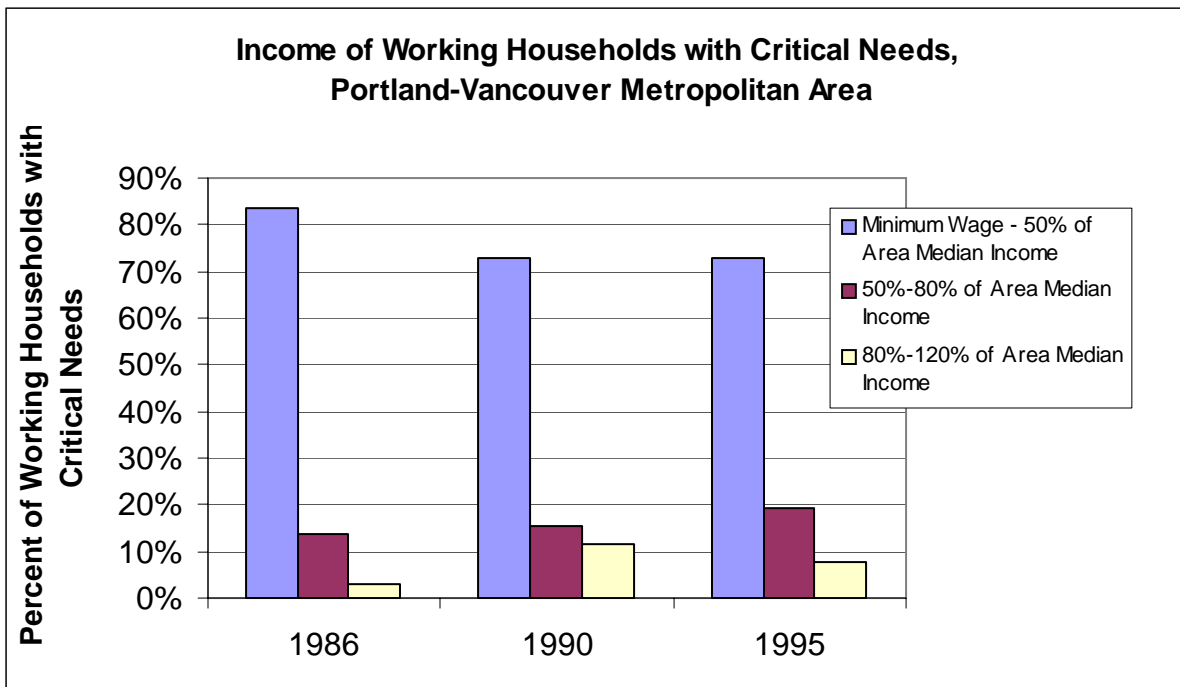


Figure 11.



APPENDIX A.

METROPOLITAN PORTLAND POPULATION GROWTH

In 2000, two-thirds of Oregon's 3.3 million residents lived in towns and cities. Almost one-half of Oregon's population lived in the metropolitan Portland area.

The metropolitan Portland-Vancouver area includes five of Oregon's 36 counties – Clackamas, Columbia, Multnomah, Washington, and Yamhill – and Clark County in the state of Washington. [Map A.1](#) shows the metropolitan area, including its six constituent counties. This paper presents data for both the total metropolitan area, including the Oregon and Washington portions, and for the Oregon portion only. We refer to the metropolitan Portland area when limiting discussion to the five Oregon counties.

This paper offers an overview of metropolitan Portland's population: current trends for population growth in its counties; the effect of births, deaths, and migration on population growth; how the age, sex, and ethnic composition are changing; and where residents live within the metropolitan area. Finally, the paper summarizes likely growth prospects and their implications.

Population growth in metropolitan Portland-Vancouver historically has exceeded growth for the United States, but the differential in growth rates has declined over time. Between 1990 and 1999, the United States grew by about 9 percent and metropolitan Portland-Vancouver increased by 21 percent. The ratio of population growth for metropolitan Portland-Vancouver compared to the United States in the 1990s was 2.4, meaning that the metropolitan areas have been growing at considerably more than twice the national average.

Recent Growth

The metropolitan Portland-Vancouver has steadily increased its population since 1990, growing from 1.5 million in 1990 to 1.8 million in 1999, and increase of 325,000 people or 21 percent. About 1.5 million or 82 percent of the total metropolitan Portland-Vancouver population resided in Oregon in 1997.

The metropolitan Portland population – limiting attention to the five metropolitan counties in Oregon – grew from 1.3 million in 1990 to 1.5 million in 1999, an increase of 18 percent.⁵ During the same period, Oregon's population increased at a slightly lower rate of 16 percent. Because the metropolitan Portland population expanded slightly more rapidly from 1990 than the Oregon population, an increasing proportion of the Oregon population resides in the metropolitan Portland area (see Figure A.1). At the beginning of the decade, in 1990, 45 percent of Oregon's population lived in the five counties of metropolitan Portland; by 1999, this percentage increased slightly to 46 percent.

Population growth can be viewed in either absolute or relative terms. Washington County was Oregon's fastest growth county in metropolitan Portland – in both absolute and relative terms. Washington County contributed 93,000 new residents to the metropolitan area from 1990 to 1999, for an increase of 30 percent. Multnomah County added 63,000 residents during the same period, although its 11 percent growth was the smallest change in relative terms of metropolitan Portland counties.⁶ Yamhill County was the second fastest growing county in relative terms, increasing 27 percent and adding 17,000 residents.

Natural Increase

⁵ Clark County, Washington experienced the most rapid population growth during the 1990 to 1999 period. The higher rate of growth in Clark County affected the total Portland-Vancouver growth rate. The total metropolitan growth rate of 21 percent includes the growth rate of 18 percent for the five Oregon counties and the 41 percent for Washington's Clark County.

⁶ Multnomah County increased at an average annual rate of 1.2 percent. This is a slightly higher rate than the U.S. national average of 1.1 percent.

Population growth depends on changes in three factors: birth, deaths, and migration. The difference between births and deaths is called natural increase. In most populations there are more births than deaths, and the population grows from natural increase. If in-migration is insufficient to counter-balance negative natural increase, the population declines. In most cases, however, both natural increase and net in-migration contribute to a growing population.

Both mortality and fertility levels have remained fairly steady in the metropolitan Portland-Vancouver area for the past two decades. The crude death rate (the number of deaths per 1,000 population) has remained at about 8 per 1,000 since 1980. Life expectancy at birth in Oregon is 73.2 years for men and 77.9 years for women in 1990, higher than the U.S. national average for men and lower than the national average for women.⁷ Life expectancy has increased from 67.1 years for men and 74.7 years for women in 1970.

The crude birth rate (the number of births per 1,000 population) has fluctuated within a narrow range of 14.5 to 16.5 since 1980: the crude birth rate decreased from 1981 to 1987, fluctuated up then down from 1987 to 1993, and has remained slightly over 14.5 since 1993 (see Figure A.2).

At present fertility levels, the average couple in the metropolitan Portland-Vancouver area will have about two children by the end of their childbearing years. In order to replace exactly the population, couples need to have 2.1 children. Present fertility levels are slightly less than the replacement level. In the long run, the metropolitan population would decrease at a very slow rate if there were no net in-migration.

Natural increase contributed about 33 percent of the metropolitan Portland-Vancouver area's growth during 1990 to 1999. The area's overall population growth of 325,000 was comprised of a natural increase of 110,000 and estimated net in-migration of 215,000.

The metropolitan Portland-Vancouver area population is relatively young, with a sufficient number of people in the childbearing years to produce a sizeable number of births, offsetting fertility levels that are somewhat less than the long-term replacement level. In recent years, there have been about 25,000 births and 13,000 deaths annually in the metropolitan area, adding 12,000 people each year through natural increase.

Fertility and mortality levels do not vary greatly between the six Oregon and Washington counties of the metropolitan area. The annual number of births and deaths, however, are affected by modest differences in the age composition of the different counties. Overall, there are only slight differences in the rates of natural increase for the metropolitan counties.

Internal Migrants

Migration is the main factor affecting population growth in the metropolitan Portland-Vancouver area. Net migration into the metropolitan area has been positive since 1980, except for an estimated out-migration of about 9,000 people during the economic downturn in 1982-3. Economic conditions and employment opportunities have been relatively strong since about 1988 as evidenced by net migration levels at or above 20,000 for the past ten years (see Figure A.3, which shows net migration for the Oregon portion of the metropolitan area and for the total Portland-Vancouver area). There were particularly high levels of net in-migration to the metropolitan area during 1990 and 1991, with annual net migration exceeding 40,000 annually for the Oregon and for the Washington portions of the metropolitan area.

Migration accounted for about two-thirds of the area's population increase during 1990 to 1999, and provided more than half of the increase for each of the area's counties (see Figure A.4). Clark County, Washington experienced a net gain of about 73,000 from migration during 1990 to 1999, with migration accounting for over three-fourths of its overall growth. Three other counties – Clackamas, Columbia, and Yamhill – derived more than two-thirds of their growth in the 1990s from migration.

Migration was important for all counties in the metropolitan region. Although Multnomah experienced the slowest overall growth rate, increasing 11 percent from 1990 to 1999, it received 31,000 net migrants and migration accounted for more than one-half of its total population increase.

⁷ In the United States in 1990, life expectancy at birth for men was 71.8 years and for women was 78.8 years.

Migration into and out of the Portland metropolitan area affects both the age and racial composition. These effects are discussed below.

Immigration

International migrants to the metropolitan Portland area are distinctive. About two-thirds of immigrants in the 1990s came from only six countries: Russia and other countries of the former USSR (20 percent of all immigrants), Vietnam (18 percent), Mexico (11 percent), China (6 percent), Korea (4 percent), and the Philippines (4 percent). The most unique aspect about the metropolitan area's immigration is the relatively high proportion of immigrants from the former USSR -- primarily from Russia. The proportion of Russians among Portland's immigrants is more than twice the national average.

Migration does more than change the age or ethnic mix of the population. The presence of migrants with different skills affects economic growth, adding new workers to the metropolitan labor force and, in some cases, providing needed skilled employees for local industries with job shortages.

Although foreign-born men are somewhat more likely to be in the high-education, high-paying jobs, they are also far more common in low-education, low-paying jobs. Compared with native-born men, immigrants are found in some occupations requiring high levels of education, such as college teachers and engineers, as well as some occupations requiring little schooling, such as tailors, waiters, and housekeepers and butlers. The picture for immigrant women is similar. Foreign-born women in the metropolitan area are disproportionately employed in a few high-education occupations, such as foreign-language teachers and physicians, but they also make up a large share of employment in many occupations that require little schooling: dressmakers, graders and sorters of agricultural products, waitresses, and private household service workers.

Factors Affecting Metropolitan Population Growth

Unemployment rates decreased from their peak of over 10 percent in 1982 and, except for an upswing in 1992-3, have remained below 5 percent since 1988 (see Figure A.5). Improved employment opportunities have attracted in-migrants as well as retarding out-migrants that might have departed the metropolitan areas in search of jobs, if attractive employment had not existed here.

There have been shifts in the major economic sectors for employment in the metropolitan area. The most noteworthy changes since 1980 have been (a) increases in the service sector, (b) substantial increases in high-tech, and (c) decreases in lumber-related employment. Overall, more than three-fourths of all current employment in the metropolitan area are in services, trade, and government.

Income in metropolitan Portland area has been increasing since 1982. In 1998 constant dollars, taking inflation into account, average per capita income in the metropolitan Portland area increased from 20,498 dollars in 1980 to over 23,531 dollars in 1990. Since 1990, per capita increases have been noteworthy: reaching 29,340 dollars in 1998 -- the most recent year for which per capita income figures are available.

Factors Affecting Population Distribution

From a demographic perspective, family and individual residential location is influenced by income, age or life cycle status, ethnicity, housing choices, and location of employment. Given the employment decentralization observed in the metropolitan area, population decentralization was certain to occur. The consequences of the other factors are more ambiguous.

Over the 1990 to 1999 period, per capital income increased more rapidly than median household income in the metropolitan area. The difference between the two is attributable to the composition of households. The mix of households in the metropolitan area has changed since 1990 as the number of single-parent, childless-couples, and

single-adult households increased.⁸ By and large this change amounted to a shift toward household types that traditionally had lower incomes. This shift retarded growth in household median income at the same time that earnings growth, while not as strong as in the 1950s and 1960s, remained robust. As a result, increases in income may have contributed more to decentralization of population than the median income figures would suggest.

Decentralization tendencies created by income change and employment dispersion have been partially offset by an influx of migrants and changing household size. For the metropolitan area as a whole, over two-thirds of 1990 to 1999 population was attributable to net migration. Most of this migration is made up of people from elsewhere in the United States who are presumably attracted to the metropolitan Portland area by the growing economy and job opportunities, the attractive environment, or both. About one-fourth percent of metropolitan Portland's migration is attributable to migration from abroad.

Age Composition

Fertility and mortality levels and the volume and composition of migration affect the age composition of the metropolitan population. If there were no migration, then the current population would become steadily older because fertility levels are relatively low. In the long run – again, assuming no migration – the median age of the metropolitan population would increase from its current level of about 32 years to about 38 years in 2050. Migration into the metropolitan area has the short-run effect of making the population slightly younger. In the long run, however, continued in-migration will increase the average age of the metropolitan population. This statement may seem counter-intuitive. But migrants eventually become older themselves. A steady stream of in-migrants, even if somewhat younger at the time of migration, will increase the number of people who age and will, eventually, increase the number and proportion of elderly in the metropolitan area.

Figure A.6 displays metropolitan Portland's population pyramid. Compared to the United States, metropolitan Portland is slightly younger, reflecting the larger number of young adults who have arrived recently in the area.

The age composition of the metropolitan population is important for a variety of reasons. The number and proportion of people by age affects schools, the labor force, health care, and the demand for recreation, entertainment, and stores. Figure A.7 shows current trends in the age structure.

Slightly less than one-fifth of metropolitan residents, or 19 percent, are in the school ages of 5 to 17 years. In 1999, there were 330,000 metropolitan residents in the school ages, an increase of 56,000 from 274,000 in 1990.

Young adults in the population, aged 17 to 24 years, are an important population group. They are the primary age group for the college population, for getting married, and for entering the labor force. The young adult population increased from 140,000 in 1990 to 177,000 in 1999, an increase of 37,000.

The working ages of 25 to 64 years are the main age group in the labor force. This age group also includes most parents in the metropolitan area. The population in the working ages grew from 804,000 to 987,000 during 1990 to 1999. It remained relatively constant as a proportion of the total population at 59 percent.

The elderly population includes people who are less active in the labor force and are important users of health services. Although the elderly increased by 16,000 from 1990 to 1999, growing from 183,000 to 199,000, they remained steady at 11 percent of the total population.

ETHNIC COMPOSITION

The metropolitan Portland population is a relatively homogeneous population compared to other major cities in the United States or in the Pacific region. Metropolitan Portland's minority population constituted 13 percent of the metropolitan population in 1997. For metropolitan areas with population greater than one million, the U.S. average in 1990 was 36 percent. Moreover, the metropolitan Portland population is considerably less diverse than such other metropolitan areas as Seattle, San Francisco, San Jose, Los Angeles, or San Diego.

⁸ Assuming that the metropolitan area resembles trends for Multnomah County for the 1990 to 1996 period. A large household survey for Multnomah County in 1996 offers data for analysis of trends since 1990. Similar data are not available for the other counties in the metropolitan Portland area.

The most significant trend in ethnic composition is the dramatic increase in the minority share of the metropolitan Portland population. There were gains in the minority population for every county in the metropolitan area since 1990. The overall minority population – including Asian Americans, Hawaiians and Pacific Islanders, Hispanics, African Americans, and American Indians – increased from 139,890 in 1990 to 200,020 in 1997, an increase of 43 percent (more than twice as fast as the overall metropolitan increase of 17 during the same period).

The sources of the growth of the minority population vary. Almost all the African American and American Indian residents in metropolitan Portland are native-born. Many Asian American and Hispanic migrants, however, are usually foreign-born, although native-born children often accompany them.

Fueling by internal and international migration, as well as fertility levels above the Oregon state average, Hispanics are the fastest growing minority population in the metropolitan area. The Hispanic population increased from 44,733 in 1990 to 77,100 in 1997, an increase of 72 percent during the period. Hispanics are currently the largest of the various minority groups in the Portland metropolitan area.

Asian Americans have the second fastest rate of growth of minority groups, increasing from 46,644 in 1990 to 66,200 in 1997, an increase of 42 percent. Asian Americans have fertility levels similar to the Oregon state average. Metropolitan Portland receives a large number of immigrants from Vietnam, Hong Kong, Taiwan, Korea, Philippines, and Japan as well as Asian Americans who move here from other states. Asian Americans are the second largest minority population in the metropolitan area.

African Americans are the third largest minority population in the metropolitan area, numbering an estimated 47,200 in 1997, and an increase of 22 percent from 1990. There is a net migration of African Americans into the metropolitan area, but at a considerably lower level than for Hispanics or Asian Americans.

The metropolitan Portland area included an estimated 9,600 American Indians in 1997. There is modest net migration of American Indians into the metropolitan area, from Oregon and nearby states, but the American Indian population remains relatively small.

The U.S. Office of Management and Budget has directed the Bureau of the Census and other federal agencies to begin the transition to a revised federal classification scheme for racial and ethnic data. The new scheme will affect 2000 census data and will gradually become common for other federal data collection and presentation. There are two major changes in the new scheme. First and foremost, the census, surveys, and federal data collection forms will ask respondents to report more than one race or ethnic group, if they wish. Second, native Hawaiians and other Pacific Islanders will report themselves separately from Asian Americans; data will also be presented separately for Hawaiians and Pacific Islanders.

We lack current estimates for the number of Oregonians and metropolitan Oregonians who might report themselves as multiracial – that is, as identifying with more than one racial/ethnic group. Because most Portland and Oregon residents report themselves as white, the number who report themselves as multiracial in the 2000 census will probably be small, perhaps only 1 or 2 percent of the total population.

We do have estimates of the Hawaiian and Pacific Islander population from the 1990 census. Pacific Islanders are a very small population in Oregon, numbering only 5,000, of whom 2,300 lived in metropolitan Portland. Although we lack data on net movements from Pacific Island areas, especially American Samoa and Guam, it is likely that migration of Pacific Islanders from Hawaii and other Pacific areas added to the metropolitan population in the 1990s. Pacific Islanders are likely to remain, however, the smallest of Oregon's and metropolitan Portland's minority populations for the foreseeable future.

Influence of Immigration

The size of the international migration influx to the United States in the 1990s rivaled the great waves of immigration experienced at the beginning of the century. Taking illegal immigration into account, the best available estimate is that the total inflow amounted to about 1.1 million annually since 1990. California received about 26 percent of these newcomers, and another 42 percent went to the other five major immigrant-receiving states of New York, Texas, Florida, New Jersey, and Illinois.

Oregon's share of total U.S. immigration has been relatively modest, with only about 5,000 to 6,000 immigrants arriving in the state each year since 1990. Over 80 percent of immigrants arriving in Oregon went to the metropolitan Portland area.

While the flow of immigrants into Oregon may not be large, other evidence suggests that many immigrants, especially those from Mexico, originally settled elsewhere before moving to Oregon. As a result, the growth of the foreign-born population includes both the 5,000 to 6,000 new immigrants as well as an unknown number of foreign-born persons who move to the metropolitan area from other states. At the current time, economic conditions in Mexico and nearby Central American countries continue to produce a steady stream of migrants intent on relocating in the United States. A plausible assumption is that some of the new immigrants to the United States from Latin America may settle in Oregon, even if they initially live in some other state. The large and growing Mexican-origin population in California guarantees a source of future migrants who find Oregon attractive if job opportunities exist.

The social, political, and economic consequences of the inflow of migrants, both native and foreign-born, are substantial. The major social consequence is that an area that has been ethnically homogeneous is becoming less so. While active political participation for some ethnic groups will take time, general minority participation in city, state, and congressional campaigns has increased in the 1990s. Economically, the influx of new residents has increased younger minority workers in the metropolitan labor force, adding low and semi-skilled workers as well as managerial and professional workers.

IMPLICATIONS FOR FUTURE GROWTH

Assuming a continuation of current state and local area conditions and policies, population in the metropolitan Portland-Vancouver area is expected to grow from 1.5 million in 1990 to 1.9 million in 2000, 2.0 million in 2005, and 2.1 million in 2010 (see Figure A.8). The Portland-Vancouver metropolitan area is expected to increase by 14 percent over the next ten years at an annual population growth rate of 1.3 percent.

The age composition of the metropolitan population will change under the impact of low fertility, increasing life expectancy, and continued net in-migration (see Figure A.9). Although all population age groups will increase between 2000 and 2010, the percentage distribution of the population by age will change.

- There will be a decrease in the proportion of the population less than 18 years of age, reflecting a continuation of current low fertility levels.
- The proportion of young adults, aged 18 to 24 years, will decrease slightly.
- The proportion of the population in the working ages, 25 to 64 years of age, will increase modestly during the next 10 years, reflecting continued in-migration of younger persons.
- The population in Oregon who are currently between 55 and 64 -- and who will retire as they reach 65 years of age and older during the next decade -- were born from 1935 to 1945, a period of very low fertility during the Great Depression and World War II. Oregon's population, similar to the U.S. population, will *not* experience rapid increase in the older population until the larger birth cohorts of the Baby Boomer began to retire. The first large group of Baby Boom births occurred in 1946 and will become 65 years of age in 2011. After 2010, therefore, there will be sharp increases in Oregon's older population, steadily increasing the older population in relative and absolute numbers for the following twenty years, from about 2010 to 2030.
- The proportion of persons 65 years of age and older, will decrease until about 2005 and then begin to increase.

The accuracy of these forecasts depends upon a series of assumptions concerning national and regional events. The forecasts will be monitored and revised over the next years on a cooperative and coordinated basis with Portland State University's Population Research Center and the State of Oregon's Office of Economic Analysis and State Employment Department.

The pace of population growth in the metropolitan Portland area has slackened appreciably in the past several years, following strong economic and population growth during 1989 to 1993. Prospects for future population increases are moderate, although an economic recession or shifts in international and national markets for Oregon's exports could adversely affect the metropolitan economy, resulting in decreased employment opportunities and population growth.

Compared with trends of previous decades, the forecasts for population growth in the next ten years, 2000 to 2010, are moderate. It is difficult, however, to be overly pessimistic concerning the future of the metropolitan economy given its present strengths and the growing ties of the state economy with overseas markets. In the past, metropolitan Portland has thrived in good times and, except for dramatic shifts in the state economy in the 1980s, has survived fairly well in bad times. At the present time, there is little evidence that the metropolitan area has lost its favored status among West Coast cities for future continued moderate population growth.

Figure A.1. During the 1990s half of Oregon population growth occurred in the Portland Metro area

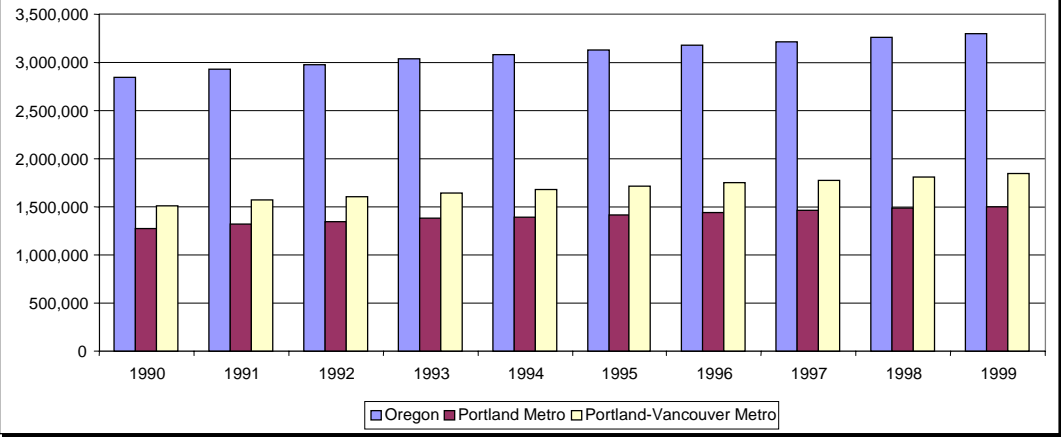


Figure A.2. The metropolitan Portland birth rate has fluctuated within a narrow range for the past 20 years

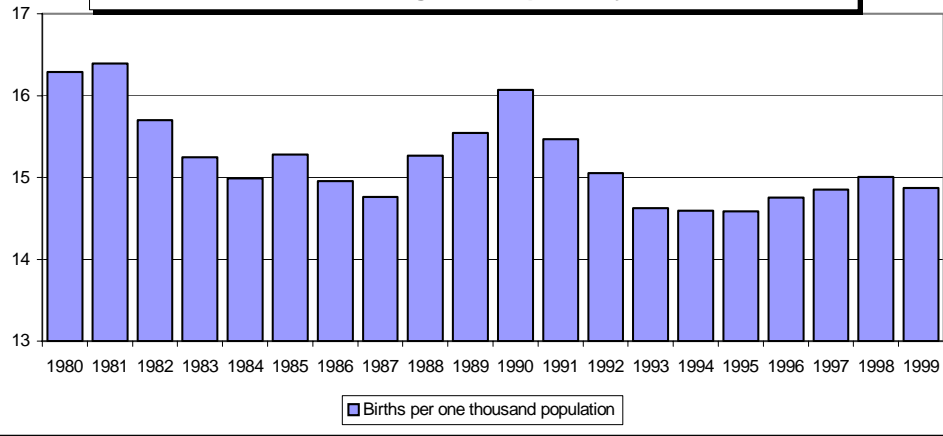


Figure A.3. Net Migration into the metropolitan area has been above 10,000 per year since 1988

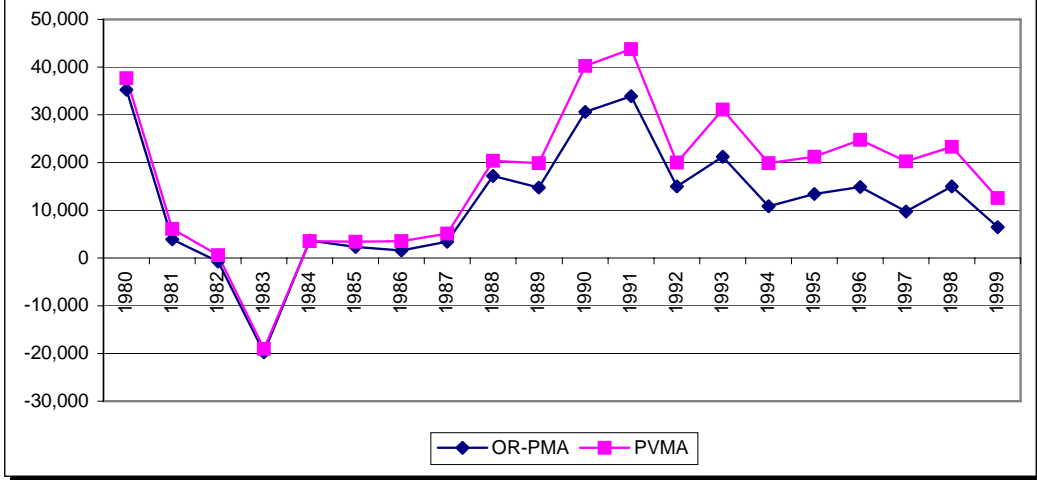


Figure A.4. Most of the growth during the 1990s was due to migration although there are differences between counties

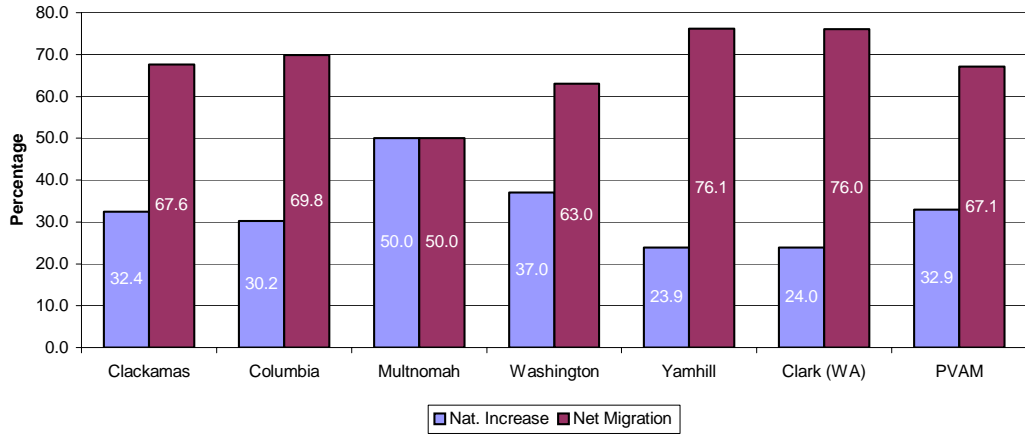


Figure A.5. Unemployment rates have been decreasing and are below the Oregon average

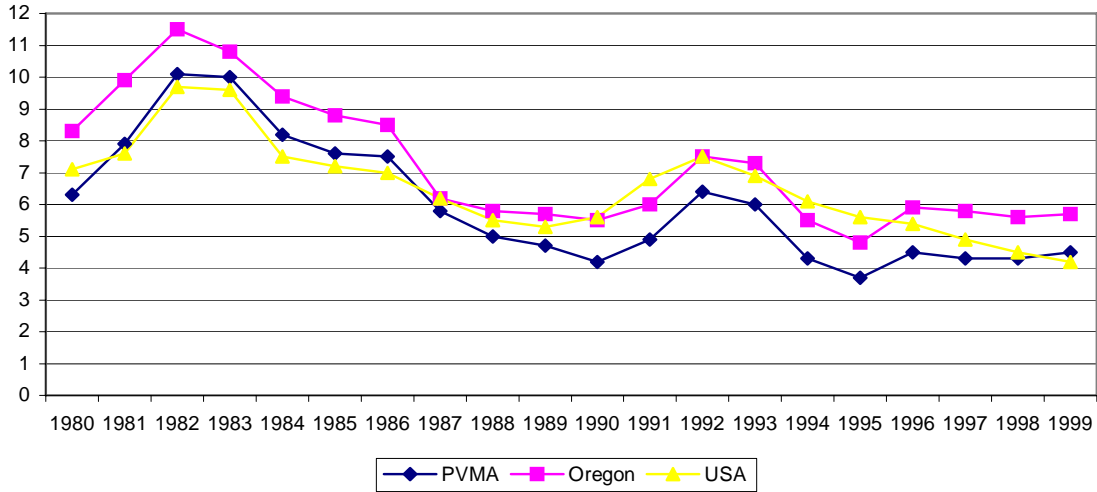


Figure A.6. The Population pyramid for the Portland metropolitan area has distinctive features

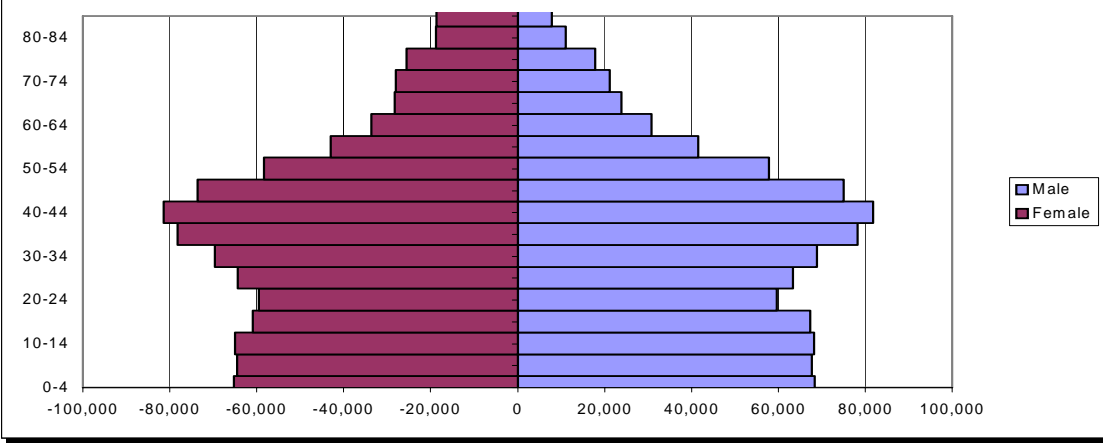


Figure A.7. Working adults have slightly increased and the elderly have decreased in the 1990s

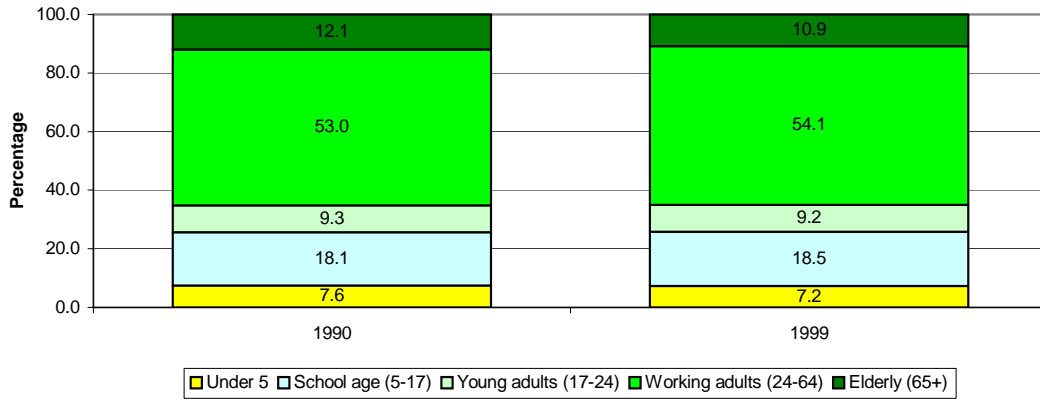


Figure A.8. The metropolitan Portland and Oregon population will increase in coming years

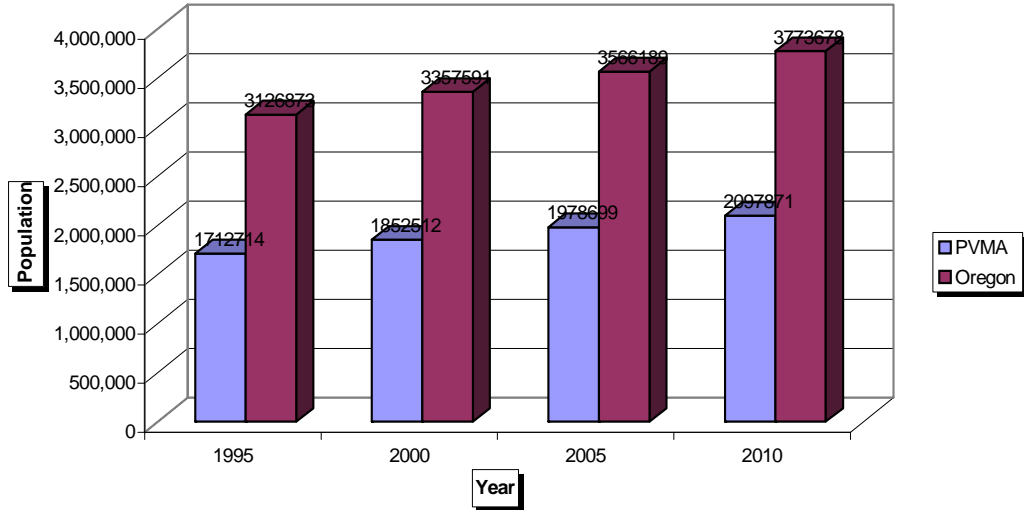
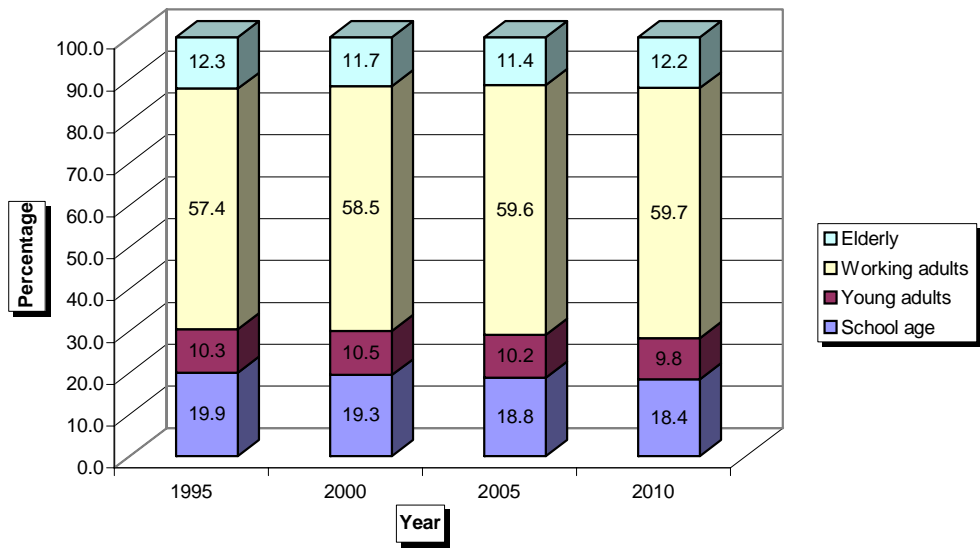


Figure A.9. Metropolitan Portland's age composition will change by 2010



Appendix B

Selecting Similar Metropolitan Areas for Comparison with Portland

To compare metropolitan Portland with other metropolitan areas, we want to select several areas that are similar. We used data from the U.S. Census Bureau's *State and Metropolitan Area Data Book, 1997-98* as a source of the most recent comparable information. The *Data Book* presents information for 159 data items for all metropolitan areas, using the most recent data available to the U.S. Census Bureau in 1998. Until 2000 census data are tabulated in mid-2002, the 1997-98 of the *Data Book* is the most current information available.

1997-98 Data Book

The 1997-98 *Data Book* provides information for 313 metropolitan areas. Our analysis focuses on the similarity between the Portland-Vancouver Primary Metropolitan Statistical Area (PMSA) and the other 312 metropolitan areas. The Portland-Vancouver PMSA, as defined by the Office of Management and Budget, includes Clackamas, Columbia, Multnomah, Washington, and Yamhill counties in Oregon, and Clark County in Washington.

We examine five dimensions for metropolitan areas, including demographic structure, ethnic composition, social indicators, income and employment, and employment structure. For each dimension, we use 4 to 7 indicators for measuring similarity between metropolitan areas.

Measuring Similarity

For the measurement of similarity, we standardize each variable, converting each variable to its Z-score equivalent. We convert variables to Z-scores because the units of measurement for the original variables are not equivalent (e.g., population size in millions of people is not an equivalent measurement to the percent of population aged 65 years or older). Z-scores measure the standard deviations for each metropolitan area, based on each variable, away from the overall mean, based on each variable. Z-scores are unitless because both the numerator and denominator are expressed in the same units. By construction, Z-scores have a mean value of 0 and their mean absolute deviation is equal to 1.

The next step is to compute distances between the metropolitan areas, in order to quantify their degree of dissimilarity. We use a Euclidean distance for the calculation, where the Euclidean distance reflects the true geometrical distance between the points defined by the variables for each dimension for each metropolitan area with the points defined for each other metropolitan area.

The essential question for this type of similarity-dissimilarity measurement is: Which weights should be assigned to the variables? Because the variables have different measurement units and are selected within similar dimensions, one probably wants to assign equal weights to the variables, having standardized the variables first using Z-scores and then computing ordinary Euclidean distances. For this exercise, we do not believe that the original measurement units are meaningful in themselves (e.g., we are not interested in the actual unemployment rates for each metropolitan area but, rather, the comparison between areas of those with higher or lower unemployment rates). If the original measurement units were retained, then the variables would be weighted by the units inherent in the raw data. Alternatively, one could use the raw data and impose certain weights on the variables, based on prior beliefs or background information.

Using the distance matrix for all 313 metropolitan areas, we use partitioning methods to find the group of metropolitan areas that form a common cluster with metropolitan Portland. We repeat a similar analysis using the variables for each of the five dimensions, and once for an analysis that uses variables for all five dimensions.

Results for Five Dimensions

We include variables for metropolitan population size and recent metropolitan population growth in each of five dimensions because we want to compare Portland, regardless of the specific dimension, with metropolitan areas of similar size and population growth.

Demographic structure reflects the current age composition and outlook for population growth. We select four measures of the age composition: the school-age population (5-14 years), young adults (25-34 years), young middle-aged adults (35-44 years), and the elderly (age 65 years and older). We select the U.S. Census Bureau's projected metropolitan growth from 2000 to 2010 to measure the outlook for metropolitan growth.

Metropolitan Portland is distinctive in its demographic structure in several ways. First and foremost, Portland has had and is expected to have more rapid population growth than other metropolitan areas. Portland ranks among the top one-fourth of metropolitan areas in terms of recent and future population growth. Second, Portland's age structure includes more adults in the active labor force years, especially ages 35 to 44 years, than other metropolitan areas; on the other hand, Portland's population includes fewer youth, children, and elderly than other metropolitan areas.

Based on demographic structure, Denver, CO is the most similar metropolitan area to Portland. In rank order, the next most similar metropolitan areas are Albuquerque, NM; Charlotte, NC; Sioux Falls, SD; and Jacksonville, FL. As shown in the first column of Table A-2, the dissimilarity distances show that Denver (0.99) is distinctly closer to Portland than Albuquerque (1.37), ranked second, and there is a considerable further distance between Portland and the areas ranked 3 to 10.

Ethnic composition reflects the proportion of the metropolitan population that reports itself white, black, Asian or Pacific Islander, or Latino. Although the data for racial composition are based on U.S. Census Bureau estimates for 1996, there are little differences between them and the percentages reported in the 2000 census. We calculated dissimilarity distances for a few metropolitan areas using 2000 census data and found distance measures very close to those based on the 1996 estimates.

Metropolitan Portland's is less diverse and includes fewer minority groups than other metropolitan areas. Regarding specific racial groups, Portland's population includes a higher proportion white and Asian than other areas, and a lower proportion black and Latino than other metropolitan areas.

Based on ethnic composition, the two metropolitan areas most similar to Portland are, in rank order, Salt Lake City, UT and Denver, CO. Fort Worth, TX (1.29) ranks as the third most similar, but not as closely similar as Salt Lake City (0.71) and Denver (0.83). The remaining metropolitan areas that are similar to Portland, shown in the second column of Table A-2, have similar dissimilarity distances.

Social indicators reflect the percent public school enrollment of the school-age population, crime rate, and infant mortality rate.

Metropolitan Portland has higher public school enrollments, a higher crime rate, and a lower infant mortality rate than other metropolitan areas.

Based on these three social indicators, taking population size and growth into account, metropolitan Portland is most similar to Orlando, FL (0.84) and Denver, CO (0.86), in rank order. The next group of most similar areas is Sacramento (0.99), Seattle, WA (1.00), and Fort Worth, TX (1.05), following by the remaining five areas shown in the third column of Table A-2.

Income and employment reflect a variety of measures, including the composite cost of living, the percent of persons below the poverty level, per capita income, and the unemployment rate.

Compared to other metropolitan areas, Portland has a lower proportion of persons in poverty and a higher per capita income. The cost of living in Portland is higher than other metropolitan areas. Portland's unemployment rate is slightly below other metropolitan areas.

Based on these four indicators, Denver, CO (0.81) is the most similar metropolitan area to Portland, following by Charlotte, NC (1.02) as the second most similar. The remaining eight metropolitan areas vary greatly, with dissimilarity distances that range from values of 1.23 to 1.53, as shown in the fourth column of Table A-2.

Employment structure reflects the composition of the metropolitan workforce, measured by the percentage of earnings in different industrial sectors. We use five measures of the metropolitan employment structure, the percent of earnings in manufacturing; retail trade; finance, insurance, and real estate; service; and government.

Metropolitan Portland's employment structure is noteworthy in two ways: there is a much higher proportion of labor force in finance, insurance, and real estate and a much lower proportion in government than in other metropolitan areas. Portland's employment has slightly more persons working in services and slightly less working in retail trade than other areas. About the same proportion of the labor force works in manufacturing in Portland as in other areas.

Based on employment structure, the most similar metropolitan area to Portland is Salt Lake City (0.98). The next most similar areas, in rank order, are Seattle, WA (1.18), Denver, CO (1.19), Nashville, TN (1.20), and Fort Worth, TX (1.21). The remaining five areas have higher dissimilarity distances, ranging from 1.35 to 1.64.

Results of Overall Measurements

Combining all the variables discussed above, from the five dimensions, the overall most similar metropolitan area to Portland is Denver, CO (2.26), as shown in Table B-3. Denver has high similarity to Portland on each of the five dimensions and is noticeably more similar to Portland than any other area. Fort Worth, TX (3.22) is the second most similar metropolitan area, with high similarity to Portland on four of the five dimensions, and medium similarity to Portland on the income and employment dimension.

The next three most similar areas are Minneapolis, MN (3.85), Charlotte, NC (3.86), and Seattle, WA (3.88). Although each of these three areas has high overall similarity to Portland, there are important distinctions. Minneapolis has high similarity to Portland only in its ethnic composition; for the remaining four dimensions, there is only medium similarity. Charlotte has high similarity to Portland in its demographic structure and in its employment structure. But Charlotte has very low similarity to Portland in its income and employment. Seattle has high similarity to Portland in its ethnic composition, social indicators, and employment structure; its demographic structure and income and employment, however, have only medium similarity to Portland.

The remaining five metropolitan areas are reasonably similar to Portland in overall measurements, but have important differences when examined on the five dimensions. Colorado Springs, CO has high similarity to Portland only in its ethnic composition. Spokane, WA does not have high similarity to Portland on any of the five dimensions. Tacoma, WA and Dallas, TX have high similarity only on social indicators. Orlando, FL has high similarity on ethnic composition, social indicators, and income and employment; its demographic structure and employment structure, however, have only medium similarity to Portland.

Selecting Metropolitan Areas from the American Housing Survey

The American Housing Survey includes major metropolitan surveys on a rotating basis. Our selection of metropolitan areas similar to Portland is restricted to those areas whose surveys are available for the same years as Portland. Based on these data restrictions, we select Denver, CO, Sacramento, CA, and San Antonio, TX for analysis here. Based on the work above, Denver is the only one of these three areas that has high similarity to Portland. Sacramento has medium similarity to Portland in demographic structure, ethnic composition, social indicators, and income and employment; it has low similarity in economic structure, with a much greater proportion of its economy based on government than in Portland. San Antonio has medium similarity with Portland in demographic structure, social indicators, and employment structure; it has low similarity to Portland in its ethnic composition, with a much higher proportion of minority groups than Portland, and income and employment, with a much lower per capita income and higher levels of poverty and unemployment than Portland. Nevertheless, these four metropolitan areas have comparable population size and growth trends and have moderate to high similarity on a number of dimensions.

Table B-1. Definitions of Variables for Five Metropolitan Characteristics

I. Demographic Structure

1. Metropolitan population size
2. Recent metropolitan population growth
3. Projected metropolitan population growth, 2000 to 2010
4. Population aged 5-14, percent
5. Population aged 25-34, percent
6. Population aged 35-44, percent
7. Population aged 65+, percent

II. Ethnic Composition

1. White population, percent
2. Black population, percent
3. Asian and Pacific Islander population, percent
4. Latino population, percent

III. Social Indicators

1. Percent public school enrollment of school-age population
2. Crime rate
3. Infant mortality rate

IV. Income and Employment

1. Cost of living index, composite
2. Persons below poverty level, percent
3. Per capita income
4. Unemployment rate

V. Employment Structure

1. Earnings in manufacturing, percent
2. Earnings in retail trade, percent
3. Earnings in finance, insurance, and real estate, percent
4. Earnings in service, percent
5. Earnings in government, percent

Data Source: U.S. Census Bureau, *State and Metropolitan Data Book, 1997-98*. Washington, D.C.: U.S. Census Bureau, 1998. This is the most recent comprehensive data for metropolitan areas, until 2000 census data become available in mid-2002.

Table B-2. Dissimilarity Distances for Portland Metropolitan Area and Other Metropolitan Areas, for Five Metropolitan Characteristics, About 2000 (metropolitan areas that are ranked as among the ten most similar areas to Portland, based on overall characteristics, are highlighted in italics).

Demographic Structure	Ethnic Composition	Social Indicators	Income and Employment	Employment Structure
<i>1. Denver, CO (0.99)</i>	1. Salt Lake City, UT (0.71)	<i>1. Orlando, FL (0.84)</i>	<i>1. Denver, CO (0.81)</i>	1. Salt Lake City, UT (0.98)
2. Albuquerque, NM (1.37)	2. <i>Denver, CO (0.83)</i>	2. <i>Denver, CO (0.86)</i>	2. <i>Charlotte, NC (1.02)</i>	2. <i>Seattle, WA (1.18)</i>
3. <i>Charlotte, NC (1.63)</i>	3. <i>Fort Worth, TX (1.29)</i>	3. Sacramento, CA (0.99)	3. Sacramento, CA (1.23)	3. <i>Denver, CO (1.19)</i>
4. Sioux Falls, SD (1.65)	4. <i>Colorado Springs, CO (1.41)</i>	4. <i>Seattle, WA (1.00)</i>	4. Raleigh, NC (1.23)	4. Nashville, TN (1.20)
5. Jacksonville, FL (1.68)	5. <i>Minneapolis, MN (1.41)</i>	5. <i>Fort Worth, TX (1.05)</i>	5. <i>Orlando, FL (1.32)</i>	5. <i>Fort Worth, TX (1.21)</i>
6. Kansas City, MO (1.68)	6. <i>Seattle, WA (1.44)</i>	6. Jacksonville, FL (1.24)	6. Grand Rapids, MI (1.41)	6. Raleigh, NC (1.35)
7. Nashville, TN (1.68)	7. <i>Orlando, FL (1.45)</i>	7. Salt Lake City, UT (1.24)	7. Santa Fe, NM (1.41)	7. <i>Charlotte, NC (1.37)</i>
8. <i>Fort Worth, TX (1.75)</i>	8. Boulder, CO (1.47)	8. <i>Dallas, TX (1.28)</i>	8. Columbus, OH (1.43)	8. Indianapolis, IN (1.50)
9. Reno, NV (1.78)	9. Reno, NV (1.46)	9. <i>Tacoma, WA (1.28)</i>	9. Greensboro, NC (1.46)	9. Kansas City, MO (1.54)
10. Oakland, CA (1.78)	10. Melbourne, FL (1.48)	10. Austin, TX (1.39)	10. Fort Myers, FL (1.53)	10. Memphis, TN (1.64)

Table B-3. Dissimilarity Distances for Portland Metropolitan Area and Other Metropolitan Areas, for Overall Metropolitan Characteristics, About 2000.

Rank Order for Overall Metropolitan Characteristics	Overall Dissimilarity Distance to Portland Metropolitan Area	High Similarity to Portland Metropolitan Area	Medium Similarity to Portland Metropolitan Area	Low Similarity to Portland Metropolitan Area
1. Denver, CO	2.26	Demographic Structure, Ethnic Composition, Social Indicators, Income and Employment, and Employment Structure		
2. Fort Worth, TX	3.22	Demographic Structure, Ethnic Composition, Social Indicators, and Employment Structure	Income and Employment	
3. Minneapolis, MN	3.85	Ethnic Composition	Demographic Structure, Social Indicators, and Income and Employment, and Employment Structure	
4. Charlotte, NC	3.86	Demographic Structure, and Employment Structure	Ethnic Composition Social Indicators,	Income and Employment
5. Seattle, WA	3.88	Ethnic Composition, Social Indicators, and Employment Structure	Demographic Structure, Income and Employment	
6. Colorado Springs, CO	3.95	Ethnic Composition	Demographic Structure, Social Indicators, Income and Employment, and Employment Structure	
7. Spokane, WA	3.98		Demographic Structure, Ethnic Composition, Social Indicators, Income and Employment, Employment Structure	
8. Tacoma, WA	4.08	Social Indicators	Demographic Structure, Ethnic Composition, Income and Employment, and Employment Structure	

9. Orlando, FL	4.12	Ethnic Composition, Social Indicators, Income and Employment	Demographic Structure, and Employment Structure	
10. Dallas, TX	4.14	Social Indicators	Demographic Structure, Ethnic Composition, Income and Employment, and Employment Structure	