Population Forecasts for the Tri-City Service District, Clackamas County Service District #1, Clackamas County Service District #1with All Damascus, and the City of Milwaukie 2010-2040

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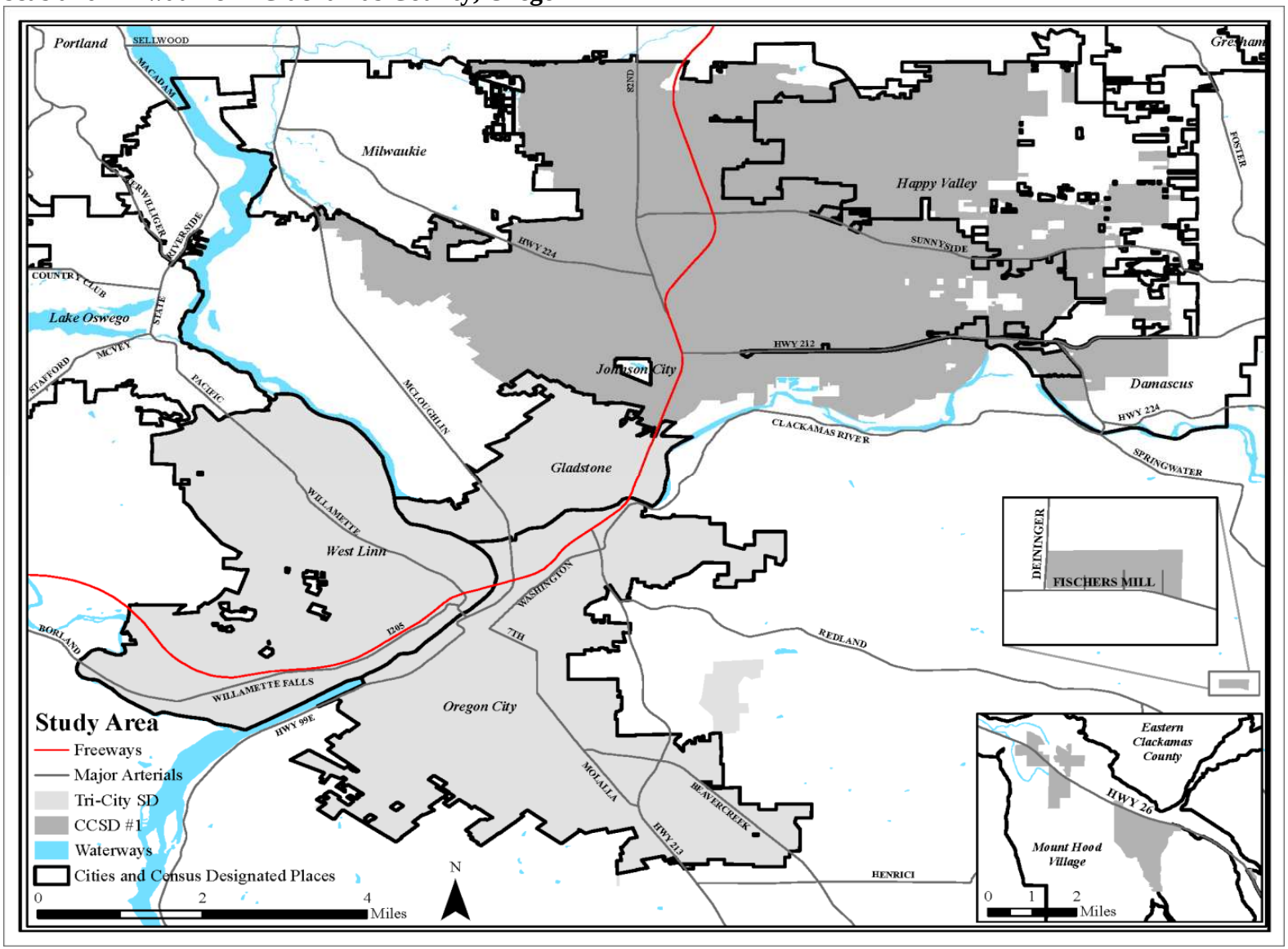
Figure 1. Study Area: Clackamas County Service District No. 1 (CCSD#1), Tri-City Service District (TCSD), and Cities of Damascus and Milwaukie in Clackamas County, Oregon



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EXECUTIVE SUMMARY

Clackamas County sewer districts – Tri-City Service District (TCSD) and Clackamas County Service District #1 (CCSD #1) – commissioned Portland State University's Population Research Center (PRC) to provide demographic analysis and population forecasts for their service areas. In addition, CCSD#1 requested forecasts that would include incorporating all of the City of Damascus into their service area (which we refer to as CCSD#1 All Damascus, or CCSD#1D) and forecasts for the City of Milwaukie.

Forecasts were prepared for each of the four study areas (TCSD, CCSD#1, CCSD#1D, and Milwaukie) for the period of 2010 to 2040 in 5-year intervals. Three scenarios of population changes were developed to account for different demographic assumptions: a medium (the most-likely) growth scenario, a scenario of lower growth, and a higher growth scenario. Additionally, forecasts for single years during the period 2010-2015 were prepared.

The forecasts consider demographic and housing composition and trends in, and within, the study areas. The factors affecting population change such as fertility, mortality, and migration are discussed and incorporated into the forecasts.

Demographics in the Study Areas

Most of the demographic trends in the study areas are similar to those in the Portland metropolitan area, Oregon, and in the nation. The highlights of demographic change in the study areas are listed below.

- TCSD and CCSD#1 experienced 2000-2010 population growth at higher rates than Clackamas County as a whole (average annual increases of 1.3% and 1.8%, respectively, and 1.1% for the County).
- The population in the portion of Damascus outside CCSD#1 is about half of the city's total population, but growth in the city is occurring faster inside CCSD#1.
- Milwaukie experienced a 2000-2010 population loss of around 250 (using consistent 2010 boundaries).

- TSCD and CCSD#1 both saw significant increases in the Hispanic population; there was a larger increase in CCSD#1 and in the portion of Damascus outside of CCSD#1, where it doubled.
- The share of population ages 65 years and older increased in all study areas.
- The average household size is decreasing in all study areas (mainly due to aging population and a slight decline in fertility).
- Fertility rates in all study areas are below the replacement fertility rate of 2.1 (2.1 is the average number of children each woman needs to have during her lifetime to keep the population stable).
- Fertility rates in all study areas have been decreasing in the past 20 years.

Population Forecasts

The population of an area is determined by the number of births and deaths that occur in the same area, and number of people moving in or out (net migrants). Of the demographic rates that influence population growth in Oregon, mortality rates change very little, and fertility rates are fairly stable – although they do vary more than mortality. Migration rates are more volatile as they are influenced by factors such as job and housing availability, and the economy.

Regardless of how the economy performs, however, the rapid population growth during the 1990s and most of the last decade seen by many areas in Oregon is not sustainable especially because the population is aging. An aging population means that the share of population that persons in the older age groups represent is becoming larger. While mortality rates may change minimally and the probability of dying decreases only slightly, the number of deaths does become greater in an aging population and has a negative effect on population growth. Additionally, in our study areas the fertility rates are below replacement levels and so together with the aging population, natural increase (births minus deaths) has a weaker effect on increasing numbers. Positive population growth then becomes more and more dependent on net in-migration.

The different growth assumptions about future trends each suggest a forecast with continuing population increases but with decelerating growth rates. All growth scenarios assume annual

growth rates that are lower at the end of the forecast horizon than in the beginning. The population growth assumptions in all scenarios developed for these forecasts indicate milder changes to future populations than those experienced during the 2000s. The demographic trends that led to robust population growth rates in the first half of the 2000s have lessened in magnitude during recent years and are not anticipated to fully rebound during the forecast period. The differences between the scenarios' assumptions represent varying magnitudes of net migration and very slight changes to fertility. These differences influence how closely growth rates return to the higher growth of the 1990s and early 2000s.

In each forecast scenario, mortality rates are the same, fertility rates vary slightly, and net migration is assumed to be the most different. All growth scenarios assume that fertility will decrease at the beginning of the forecast period and then turn around slightly before stabilizing. Migration rates, a more difficult demographic factor to estimate than the other factors, are assumed to be a main factor affecting population changes in our study areas. In each of the three scenarios, net migration during 2010 to 2040 is predicted to differ slightly.

In the medium, or most-likely, population forecast (see table below), CCSD#1 is expected to experience the largest growth. By 2040, population in CCSD#1 will be greater than in TCSD. We predict an average annual growth rate in TCSD to be only about two-thirds of the rate in CCSD#1. Incorporating all of Damascus to CCSD#1 adds an annual average of 154 persons, or 4,650 to CCSD#1's population change over the 30-year forecast period. Milwaukie is forecast to see some minimal population increases, but we do not expect population decreases that occurred in the last decade to continue.

Table 1. 30-year Population Forecast

Medium Growth Scenario	Census 2010	2040	2010-2040 Change		Average Annual Change	
			Number	Percent	Number	Percent
Tri-City	70,544	86,748	16,204	23.0%	536	0.7%
CCSD#1	68,140	92,818	24,678	36.2%	816	1.0%
CCSD#1-All Damascus	76,865	106,193	29,328	38.2%	970	1.1%
Milwaukie	20,291	22,352	2,061	10.2%	68	0.3%

INTRODUCTION

The Tri-City Service District (TCSD) and Clackamas County Service District #1 (CCSD #1), both of Clackamas County, requested that the Population Research Center (PRC) at Portland State University produce long-term population forecasts for each of the two sewer service districts. In addition, CCSD#1 requested that forecasts also be developed to include the entire city of Damascus to account for possible future annexation into its district; and the city of Milwaukie, as CCSD#1 leases services to Milwaukie.

The forecast horizon extends 30 years from 2010 to 2040, and projections are produced in 5-year intervals. For the 2010-2015 interval, forecast numbers for single years are included.

Forecasts for three growth scenarios – high, medium, and low scenarios – are developed to account for different probabilities of demographic events. We consider the medium growth forecast to be the most-likely scenario. We also include in this report an analysis of recent demographic trends that have bearing on our assumptions for future growth in study areas.

Study Areas

The project area consists of four study areas: Tri-City Service District (TCSD), Clackamas County Service District No.1 (CCSD#1), CCSD#1 with all Damascus (designated as CCSD#1 All Damascus, or CCSD#1D), and the City of Milwaukie (Figure 1). The boundary of TCSD encompasses the entirety of the cities of Gladstone, Oregon City and West Linn, and some of the unincorporated area in Clackamas County. The geographic area of CCSD#1 includes roughly half of the land area in the City of Happy Valley, a small northwestern portion of the City of Damascus, and the unincorporated county area between Happy Valley, Milwaukie, and Gladstone. TCSD and CCSD#1 each have similar 2010 populations (70,544 and 68,140, respectively). Our third study area, CCSD#1All Damascus includes CCSD#1 plus the entire city of Damascus. Incorporating the whole city of Damascus adds about 9,000 to the 2010 CCSD#1 population. The City of Milwaukie, by itself, constitutes our remaining study area and is the smallest with a 2010 population that is less than one-third of TCSD and CCSD#1 (20,300).

Almost all of the area in our study lies within the urban growth boundary (UGB, set by Metro Regional Government). If we combine the four study areas, the land area covers 64.5 sq. miles, which represents 3.45 percent of the Clackamas County. However, the study areas' combined 2010 total population is 166,701, and accounts for 44.6 percent of the County's population (375,992), which implies that the space within the study areas for the two sewer districts is quite densely populated.

Clackamas County is the fourth largest growing county in Oregon, with a 2000-2010 average annual population increase of 1.1 percent. Clackamas County population inside the UGB experienced significant growth in the first half of the 2000s, but growth has slowed in recent years. In the 2000s, population in CCSD#1 increased more rapidly than in TCSD, however in 2010, TCSD's total population is 1,800 higher than CCSD#1's. The breakdown of the population in the study areas is given in the table below (Table 2).

Table 2. Population in the Study Areas and their Geographic Components

		Population		Share of County Population		# Avg Annual Change	% Avg Annual Change
	Area	**2000 Census***	**2010 Census**	**2000**	**2010**		
Clackamas County		338,391	375,992			3,760	1.1%
Clackamas County Service District (CCSD#1)		56,943	68,140	16.8%	18.1%	1,120	1.8%
	Happy Valley (Part)	7,764	11,966	2.3%	3.2%	420	4.3%
	Damascus (Part)	762	1,814	0.2%	0.5%	105	8.7%
	Unincorporated (Part)	48,376	54,308	14.3%	14.4%	593	1.2%
	Others	41	52	0.0%	0.0%	1	2.3%
Clackamas County Service District (CCSD#1D) - All Damascus Included		64,536	76,866	19.1%	20.4%	1,233	1.8%
	Happy Valley (Part)	7,764	11,966	2.3%	3.2%	420	4.3%
	Damascus (All)	8,355	10,539	2.5%	2.8%	218	2.3%
	Unincorporated (Part)	48,376	54,308	14.3%	14.4%	593	1.2%
	Others	41	52	0.0%	0.0%	1	2.4%
Tri-City Service District (TCSD)		62,096	70,544	18.4%	18.8%	845	1.3%
	Gladstone (All)	11,389	11,497	3.4%	3.1%	11	0.1%
	Oregon City (All)	26,507	31,859	7.8%	8.5%	535	1.8%
	West Linn (All)	22,185	25,109	6.6%	6.7%	292	1.2%
	Unincorporated (Part)	2,015	2,079	0.6%	0.6%	6	0.3%
City of Milwaukie		20,535	20,291	6.1%	5.4%	(24)	-0.1%

*Data are compiled for 2010 boundaries.

Demographic Data and Forecasts

A description of recent demographic trends for each study area, along with a summary of recent significant population changes during the forecast period, is also included in this report. Consideration was given to factors that influence population dynamics in our study areas such as the population's ethnic and age composition, the number of annual births that occur, and the number of housing units built. Data used to develop the forecasts include vital statistics, land use data, and decennial Censuses of Population and Housing.

Several different demographic methods and models were employed to prepare the forecasts, including the development of cohort-component and housing unit models. The cohort-component model incorporates rates of fertility, mortality, and migration. The housing unit model assumes a number of future added housing units, levels of housing occupancy, and averages of the number of persons per household. A description of recent demographic trends in the study areas, and a summary of significant population changes during the forecast period are included in this report. Also, the data sources and methods utilized in the development of the forecasts are described in more detail later.

The different growth assumptions about future trends in the forecasts for the study areas suggest that there will be increases in population, but that they will occur at slightly different rates from the beginning to the end of the forecast period. There are variations in the forecasts for the size and timing of annual population increases. Population in CCSD#1and CCSD#1D continually increase during the forecast period, whereas TCSD and the City of Milwaukie have more fluctuations in growth. The difference between populations in TCSD and CCSD#1 becomes smaller, and then in 10 to 15 years population in CCSD#1 surpasses that in TSCD.

In the most-likely growth scenario for the population forecasts, we assume that the downturn of the local economy in 2008 will not recover until 2015. Therefore, housing construction is anticipated to be sluggish for a few years in all four study areas, but will resume after 2015. At that time the net in-migration of families with children, the elderly, and Hispanic individuals is predicted to increase and continue throughout most of the forecast period.

Caveats Regarding the Report

The body of this report covers demographic information and analysis for each of our four study areas individually. In order to produce the most accurate demographic analysis possible, Census data were aggregated to correspond to the 2010 jurisdictional boundaries. Comparing data that represent geographic areas that are consistent over time removes the influence that changing boundaries have on determining actual population trends in a jurisdiction.

Recent historical demographic trends in this report are described for 2000-2010. The 2000-2010 demographic data and trends are incorporated into the population forecasts, and how they are incorporated is described in the methods section of this document. The 2010-2040 population forecast for Clackamas County, an unpublished forecast produced by Oregon's Office of Economic Analysis (OEA) in 2008, was used as a gauge for reasonableness of our forecast results and also provides life-event rates for our forecast model.

A Note of Caution about the Forecasts

Given that these projections are developed for long-term trends, the projections are conservative and large fluctuations in growth rates are not anticipated. For example, the medium growth forecasts do not assume drastic changes in population trends, such as seen during an economic depression.

Policy makers should view population projections as one of several available sources of information about likely future conditions. The forecasts in this report are based on assumptions developed from analysis of historical trends and expectations of the future. While the past gives some indication of what is likely to happen in the future, there is always the possibility of the occurrence of unforeseen events that could have a significant impact on population change. Thus, users of these projections should be aware that unexpected changes could happen and the forecasts should be updated whenever possible. Given the uncertainty of the timing, occurrence, and magnitude of future events, several points should be kept in mind when interpreting the population forecasts in this report:

- The study area population projections represent a forecast derived from assumptions representing our best judgment as to the possibilities for future conditions. The next several years will reveal whether the modeled demographic trends are likely to occur. If other or different conditions arise, then it would be appropriate to revise the population projections, taking into account more recent trends.
- Variations in forecasts become larger over time. As the years go by, the population forecasts depend increasingly on assumptions about who and how many persons will move into and out of the area and on the number of births that will occur annually to parents who reside in the area. Therefore, population forecasts contain less certainty over longer time horizons.
- The smaller the population, harder it is to develop an accurate forecast. Slight, unpredicted variations in demographic trends can cause larger fluctuations in the population forecasts than those for larger populations. Forecasts for large areas tend to be more precise than forecasts for smaller areas.
- There is a temptation in interpreting forecasts to ask: "Which is the correct forecast?" Asking such a question implies that there is need to pick one forecast at present and then base future plans on it. The more appropriate use of the forecasts is to consider that there is likely to be some variation around the medium (most-likely) forecast, which necessitates the need to update forecasts as conditions evolve. Instead of attempting to decide which outcome will occur over the thirty year forecast horizon, we urge government officials and the public to "monitor and manage" the changing conditions that will affect future populations. The most-likely forecast presented in this report can best serve as a guideline in this process of monitoring and managing.

OVERVIEW OF THE REPORT

This report presents the results of a study conducted by the Population Research Center (PRC) to produce population forecasts for two sewer districts in Clackamas County with different growth scenarios so that long-range capacity planning needs may be addressed. This report considers recent and historical demographic changes experienced within TCSD and CCSD#1 and in the two cities of Damascus and Milwaukie.

Forecasts from 2010 to 2040 in 5-year intervals, are presented in this report. Separate forecasts were prepared for these areas: TCSD, CCSD#1, CCSD#1 with all Damascus and Milwaukie. The forecast for CCSD#1 that captures all of the city of Damascus is included to account for future annexation into the district. The stand-alone forecast for the City of Milwaukie was developed because Milwaukie leases sewer services from CCSD#1 and its population growth will have an impact on CCSD#1's future capacity demands.

Additional forecasts are also made based on lower and higher growth scenarios to provide a range of possible populations should the assumptions in the most-likely (or medium) growth scenario be in error.

For the sake of organization and discussion of demographic characteristics and trends and forecasts, the main sections in this report include a sub-section for each of the study areas. In other words, each study area - TCSD, CCSD#1, CCSD#1 All Damascus, And Milwaukie – is treated separately in much of the report.

This document covers the following topic and sections:

- Demographic Trends in the Study Areas. A description of individual study areas and the recent demographic trends and population changes that influence future populations such as fertility, age structure, racial/ethnic composition, migration, and housing growth.
- Population Growth Assumptions for the Study Areas. A description of the assumptions used in the low, medium, and high growth population forecasts for the study areas.

- The Most-likely, and Low and High Forecast Results. A summary of the forecast results and the predicted population changes in each study area.
- Methods and Data Utilized for Study Area Population Forecasts. A description of the demographic models and data used to develop these forecasts.

Several Appendices are at the end of the report and provide more detailed information, including:

- Appendix 1. Tables with detailed forecasts and historical populations in 5-year intervals for TCSD, CCSD#1, CCSD#1 All Damascus, and the City of Milwaukie; includes single-year forecasts for period 2010-2015.
- Appendix 2. Population forecasts for individual study areas by broad age groups in the medium growth scenario.
- Appendix 3. Assumptions for demographic rates in all study areas.
- Appendix 4. Tables presenting a compilation of demographic data and rates for the Census and forecast populations.
- Appendix 5. Information received from conversations with local planners.
- Appendix 6. Maps showing population density within study areas (2010).
- Appendix 7. Maps showing housing density within study areas (2010).
- Appendix 8. Data sources and data used are described.
- Appendix 9. Median household income and median value of housing units in the study areas.

RECENT DEMOGRAPHICS IN THE STUDY AREAS

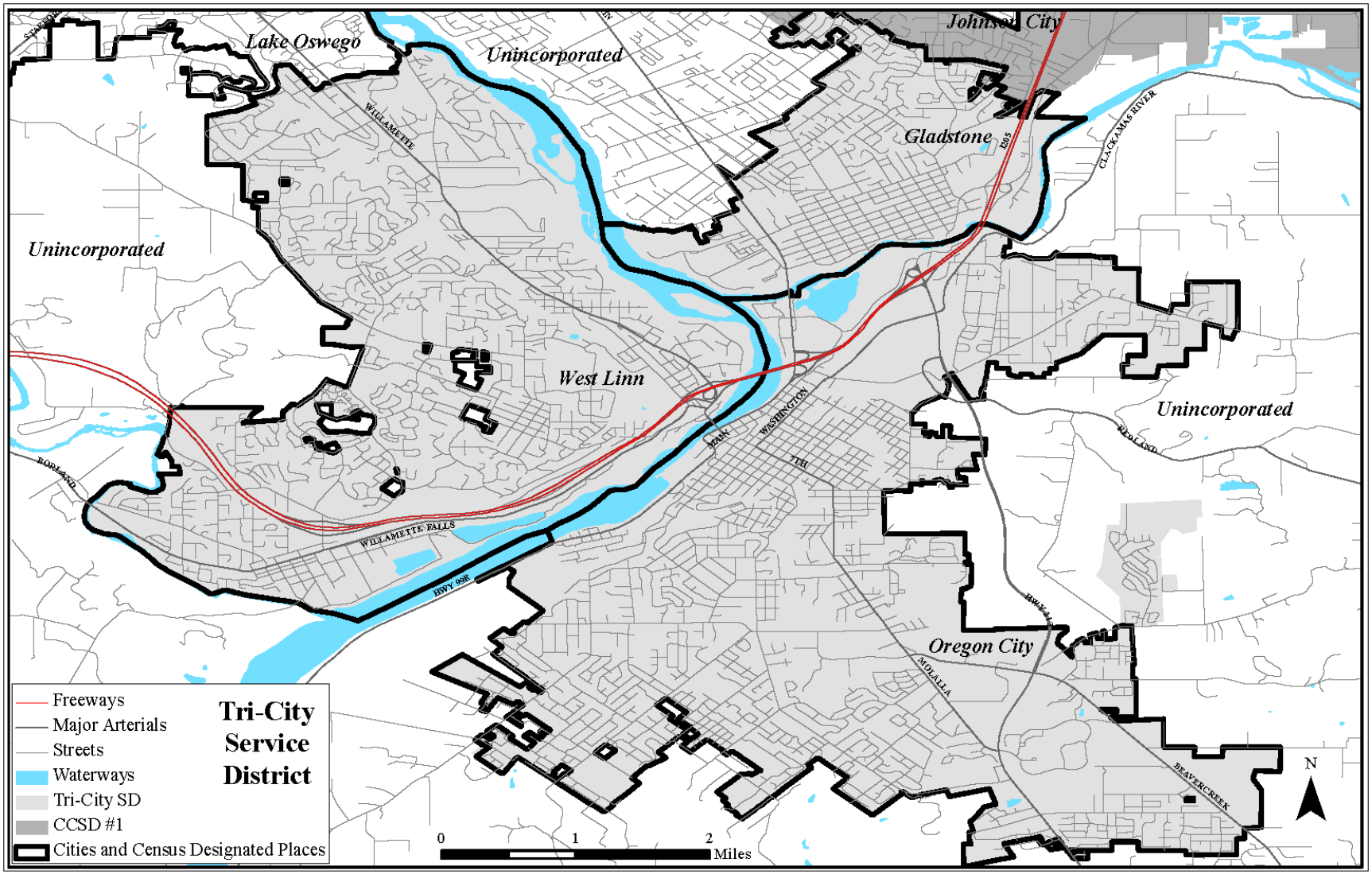
Evaluating past demographic characteristics and trends provides clues about what the forecast for the future will look like, and helps determine the realm of possibilities. Past trends explain the dynamics of population growth particular to local areas. Relating recent historical population change to the events that influenced that change serves as a gauge for what might realistically occur in a given area over the long term.

Different growth patterns during 2000 to 2010 occurred within Clackamas County. Each of our study areas were examined for any significant characteristics, or changes in population or housing growth, that might influence their individual forecasts. Factors that were analyzed include births, age structure and racial/ethnic composition of the population, and housing growth. It should be noted that population trends of individual study areas differ from one another in some aspects, but are similar in others. In general, population growth rates in recent years are lower than from 2000-2007, fertility rates have been declining slightly, and the share of population that is ages 65 years and older is increasing.

Tri-City Service District (TCSD)

The Tri-City Service District (TCSD) encompasses 21.2 square miles. Its boundary includes the cities of Gladstone, Oregon City, West Linn, and a small area of unincorporated Clackamas County (Figure 2). The outer boundary of TSCD is completely surrounded by unincorporated area except for the northeastern area of West Linn, which borders the City of Lake Oswego.

Figure 2. The Tri-City Service District (TCSD)



Population

TCSD's population in 2010 was 70,544, which represents 18.8 percent of the population in Clackamas County. The average annual population growth from 2000 to 2010 is around 1.3 percent which is slightly higher than Clackamas County's growth rate of 1.1 percent.

Each sub-district share of TCSD population is shown in Table 3 below. Oregon City captures the largest share of the District's population, followed by West Linn. These two cities experienced the most rapid 2000-2010 population growth of all TCSD sub-areas. Although Gladstone didn't see much population growth during the decade, it has the highest population density (4,562 persons per square mile) among the four TCSD sub-areas. West Linn and the unincorporated area have the lower population densities at 3,150 and 1,856 per square mile, respectively.

The share of TCSD's population held by Oregon City increased from 2000 to 2010, while the shares of Gladstone, West Linn and the unincorporated area all decreased slightly.

Table 3. Population in TCSD by Sub-area

		Population		Share of Service District Population		# Avg Annual Change	% Avg Annual Change
Area		2000 Census*	2010 Census	2000	2010		
Tri-City Service District (TCSD)		62,096	70,544			845	1.3%
	Gladstone	11,389	11,497	18.3%	16.3%	11	0.1%
	Oregon City	26,507	31,859	42.7%	45.2%	535	1.8%
	West Linn	22,185	25,109	35.7%	35.6%	292	1.2%
	Unincorporated (Part)	2,015	2,079	3.2%	2.9%	6	0.3%

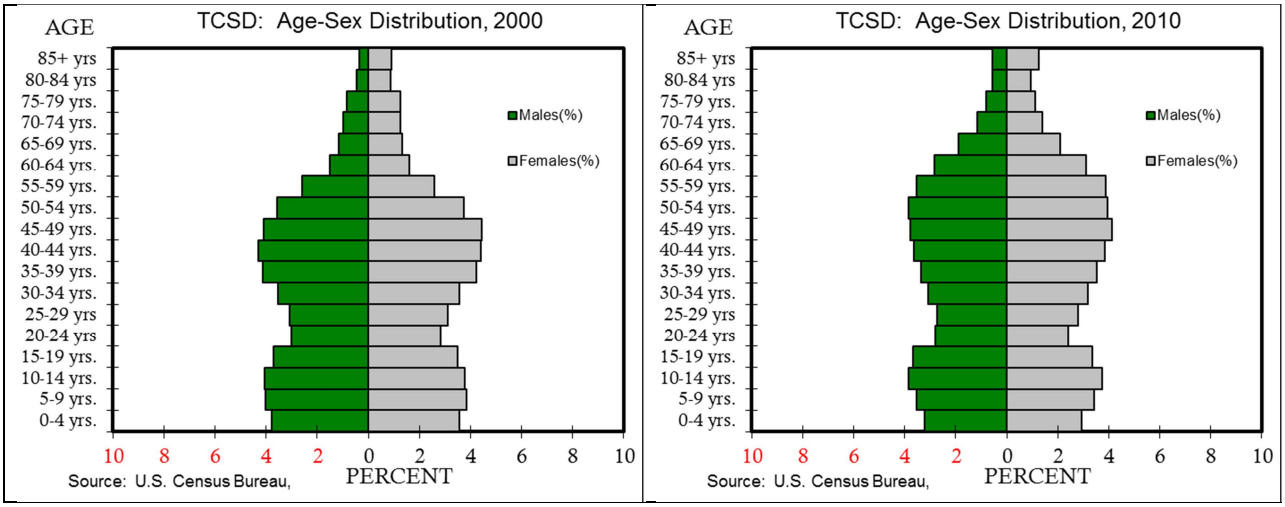
*Data are compiled for 2010 boundaries.

Age Structure

A population pyramid illustrates the structure of age and gender of given area by showing the percentages, or shares, of the total population. In TCSD, the amount of variation amongst age groups has become less pronounced in 2010 than in 2000. The reason is that there is a slight retraction of the share in younger ages and an expansion of the shares of the older groups. This

situation is referred to as an 'aging of the population', and is a trend that is occurring nationally. The share that seniors represent of the total population in TCSD increased by over two percentage points from 9.4 percent in 2000 to 11.8 percent in 2010. The share of children ages 0-17 experienced a decline of around 2 percentage points during the same time period, and the share of young adults ages 20-44, saw an even greater drop (by almost 5 percentage points). The median age in TCSD increased from 35.4 years in 2000 to 38.8 years in 2010.

Chart 1.



Race and Ethnicity

The ethnic minority population is increasing and white non-Hispanic population is decreasing statewide and nationally. In 2010, white non-Hispanics represented 87 percent of TCSD's population and ethnic minorities accounted for 13 percent. Hispanics represented the largest share of the ethnic minority population (approximately 50 percent), followed by Asians/Pacific Islanders (21 percent) and persons who identified themselves as other, or of more than one race (22 percent). Blacks and Native Americans each represented 5 percent or less of the ethnic minority population.

The Hispanic population increased by around 66 percent (over 1,700 persons) from 2000 to 2010. The remaining ethnic minority groups each experienced some increase except the Native American population, which remained somewhat stable during the time period.

Table 4. Race/Hispanic Origin

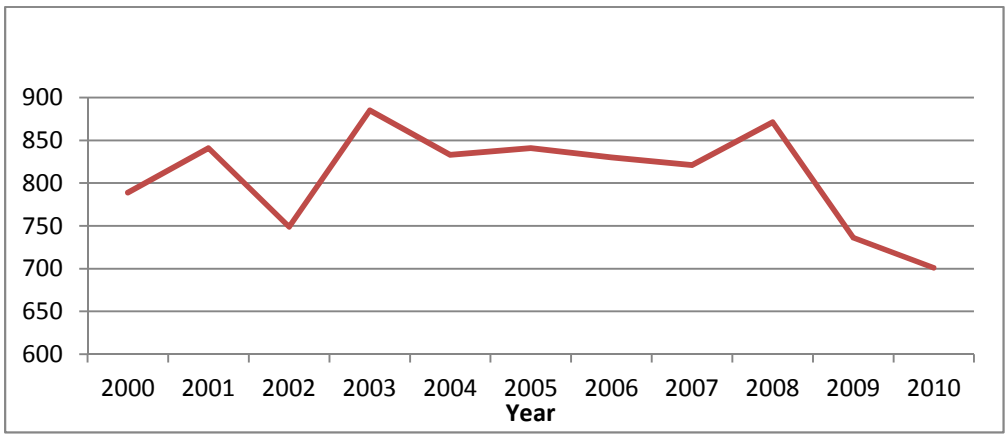
TCSD	2000	2010	2000 Share	2010 Share	#Change	% Change
White	56,179	61,496	90.5%	87.2%	5,317	9.5%
Black	335	413	0.5%	0.6%	78	23.4%
Native American	386	382	0.6%	0.5%	-4	-1.0%
Asian/Pacific Islander	1,247	1,860	2.0%	2.6%	613	49.1%
Other, including 2 or more races	1,269	1,950	2.0%	2.8%	681	53.7%
Hispanic	2,680	4,442	4.3%	6.3%	1,762	65.7%
Total	62,096	70,544	100.0%	100.0%	8,448	13.6%

Source: 2000 and 2010 U.S. Census

Births and Fertility

Since 2000, there have been between 701 and 885 births in the TCSD each year, with slightly fewer births in 2010 than in 2000. Although there are a few more females of child-bearing age in 2010 than in 2000, this slight decrease in annual births is a result of a slight decline in fertility rates. That is, the total fertility rate, or the average number of children a woman bears during her lifetime, has dropped slightly.

Chart 2. Number of Annual Births - TCSD

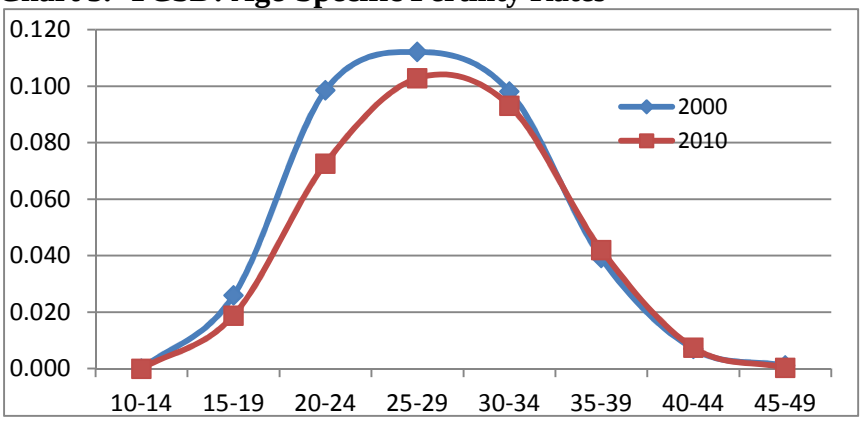


Source: Center for Health Statistics, Oregon Health Services Department

The total fertility rate in TCSD was 1.96 in 2000 and 1.93 in 2010. In the past 30 years, the total fertility rate for the nation and for Oregon has been declining. Recently, however, this decline has been at least partially offset by an increase of persons in racial/ethnic groups associated with higher fertility, and this very slight drop in TCSD is aligned with state and national trends.

The chart below shows the age-specific fertility rates – the fertility rates by the mother's age group. The age group at which the peak number of births occurred in 2010 is higher than that age group in 2000. Women postponing childbirth until older ages is another trend that has been occurring in Oregon and the U.S. in the last two to three decades.

Chart 3. TCSD: Age-Specific Fertility Rates



Source: Oregon Center for Health Statistics

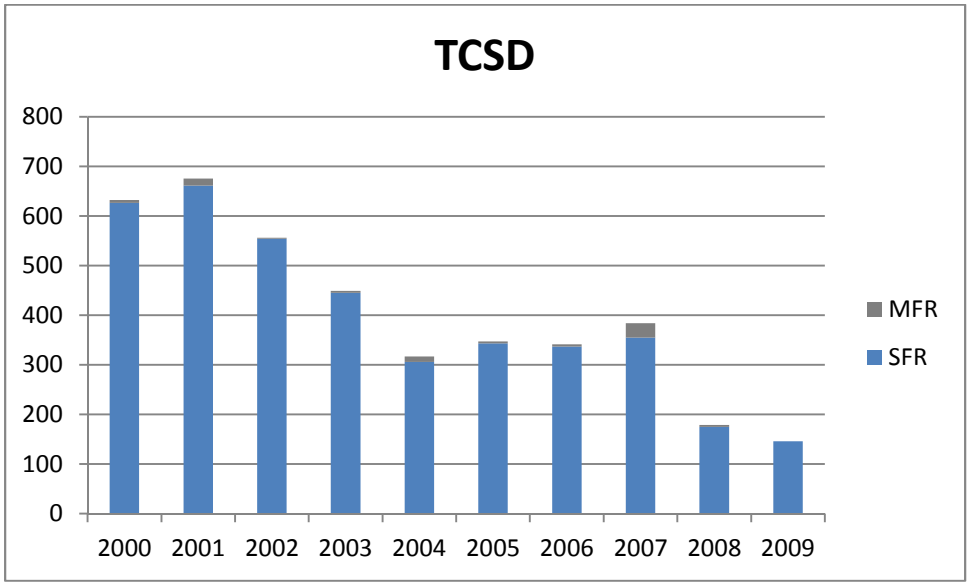
Housing and Households

The growth rates for housing differ slightly than growth rates for the corresponding population, which is because the numbers of housing units are smaller than the number of persons. Additionally, the differences in the average number of persons per household and occupancy rates affect the growth rate of households. However, the overall pattern of population and housing change is relatively similar.

From 2000 to 2010, TCSD added 4,200 new housing units. This growth represents an average annual addition of about 420 housing units. Construction of housing units in TCSD, and in most of Oregon and in the U.S., however, was greater at the beginning of the decade than toward the end. The economic recession is the general reason for the decline in the number of new housing units added annually, but new units are still being constructed and occupied.

Most housing units in TCSD are single-family units – about 77 percent. Housing construction continues to be mostly single-family residences (SFR) although some multi-family units (MFR) have been built. During the 2000s, about 2 percent of housing construction was multi-family units with a few more being built in the second part of the decade.

Chart 4. New Housing Units Built in TCSD



Source: Metro RLIS Taxlot Data, August 2011

In 2010, 93.8 percent of housing units were occupied in TCSD. This is a slight decline (about a half of a percentage point) from 2000. This increase in housing vacancy is a statewide and national trend, although the magnitude of change was not that great in TCSD. The occupancy rate in TCSD is about a percentage point higher than the rate for Clackamas County, which was 92.9% in 2010.

About 99 percent of TCSDs population resides in households and only one percent (approximately 900 persons) are in group quarters facilities (such as nursing homes, prisons, and dormitories). In general, the share of population in an area that resides in group quarters does not change much over time. However, in TCSD around 250 fewer persons were living in group quarters in 2010 than in 2000 (a 22 percent decline), and the share of persons in households increased by a percentage point.

About 69 percent of households in TCSD are occupied by homeowners and 31 percent by renters. These shares of housing tenure did not change significantly from 2000 to 2010.

The average number of persons that occupy a household (PPH), or household size, is influenced by several factors. The age and racial/ethnic composition of a population provides some indication of the size of an area's PPH. A high share of elderly population versus the share of married couples and growing families yields a small PPH due to the propensity of the elderly to live alone; whereas, higher PPH may be attributed to the tendency of some racial/ethnic groups to have larger or extended families, or to share housing. Changes in an area's fertility rates also have bearing on changes in PPH. An increase in PPH is supported by higher fertility. A stable PPH could mean that the population composition, and the number of births is stable; but it could also mean that an increase in the number of births and growing families is being offset by an increase in the elderly population.

According to Census 2010, the PPH in TCSD is 2.61, which is a decrease from 2.67 in 2000. The 2010 average household size in Clackamas County was lower than TCSD's at 2.56, and also underwent a slight drop from 2000.

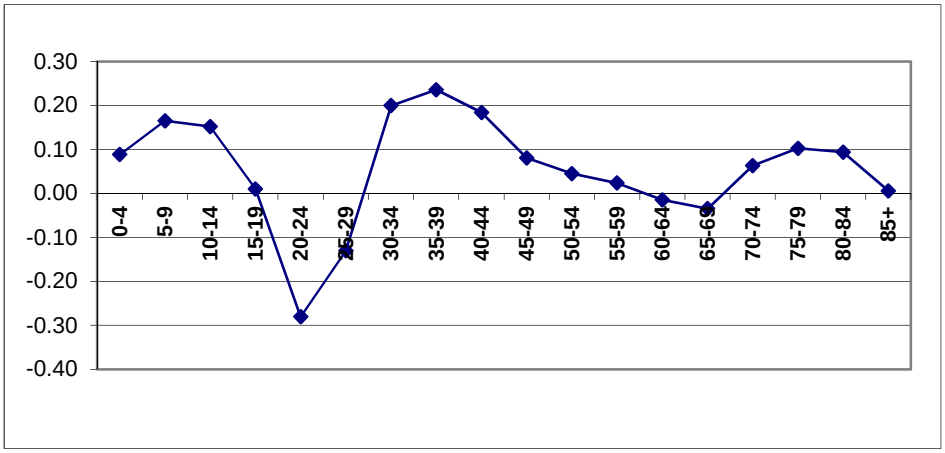
By housing type, the PPH in single-family units (SFR) is typically higher than in multi-family residences or mobile homes. This is the case in TCSD. The type of housing that is built influences the overall PPH of an area's population.

Migration

About half of the population change in TCSD from 2000 to 2010 is attributed to net migration, and half to natural increase (births minus deaths). In Clackamas County, net migration contributed to a larger portion of overall population change during the same period - about 60 percent.

A migration rate is the number of net migrants per person in a resident population. The chart below shows net migration rates based on the net in-flow and out-flow of persons by age group to TCSD from 2000 to 2010. Of most significance, it shows a net out-migration of persons ages 20-29, which typically happens in areas outside urbanized areas. Young adults leave home for educational or job opportunities. Additionally, the migration chart shows a net in-migration of children and persons the ages their parents represent, and of seniors ages 69 and older.

Chart 5. TCSD 10-yr Net Migration Rates

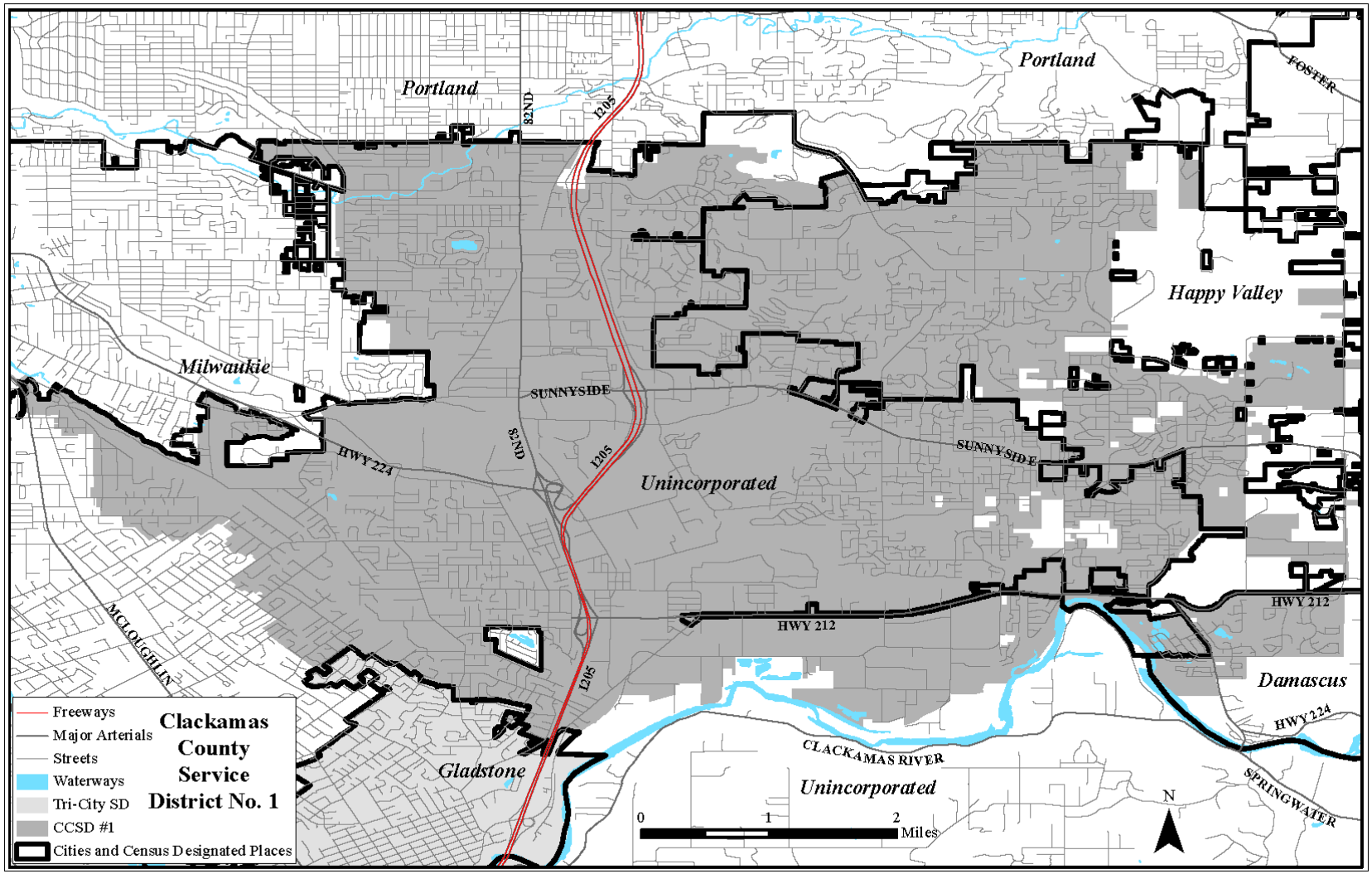


Source: 2000 and 2010 U.S. Census

Clackamas County Service District #1 (CCSD #1)

Clackamas County Service District No. 1 (CCSD#1) covers 22.7 square miles of Clackamas County and is mostly unincorporated area (see Figure 3). Its boundary includes roughly half the land area of Happy Valley, a small southwestern portion of the City of Damascus and a large County unincorporated area between the cities of Happy Valley, Milwaukie, and Gladstone. CCSD#1 also includes the non-contiguous areas of Hoodland, Boring, and Fisher's Forest Park in eastern Clackamas County (see Figure 1)). CCSD#1 is bordered by Portland to the north, Milwaukie to the northwest, Gladstone and unincorporated areas to the south, and by Happy Valley and Damascus to the east.

Figure 3. Clackamas County Service District No.1 (CCSD#1)



Population

CCSD#1's population in 2010 was 68,140, which represents 16.8 percent of the total population in Clackamas County. Its average annual growth from 2000 to 2010 is 1.8 percent which is higher than the county's growth rate of 1.1 and TCSD's of 1.3 percent. The population of the district and its sub-areas are shown in below (Table 5). The majority of the persons residing in CCSD#1 live in unincorporated Clackamas County (79.7%). The parts of Damascus and Happy Valley in CCSD#1 experienced high growth in the last decade, 2.3 percent and 4.3 percent, respectively. The part of Damascus in CCSD#1 has the highest population density at 5,777 persons per square mile, whereas the unincorporated area has the lowest population density of 3,122 persons per square mile. The share of CCSD#1's population held by Happy Valley and Damascus increased from 2000 to 2010, while the shares of the unincorporated area decreased sharply.

Table 5. Population in CCSD#1 by Sub-area

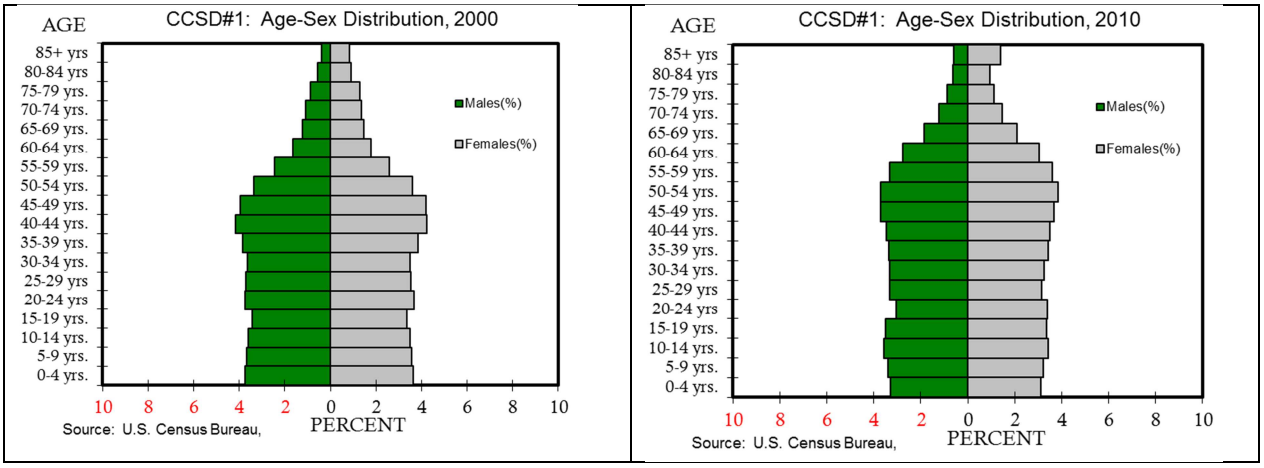
Area	Population		Share of Service District Population		# Avg Annual Change	% Avg Annual Change
	2000 Census*	2010 Census	2000	2010		
Clackamas County Service District (CCSD#1)	56,943	68,140			1,120	1.8%
Happy Valley (Part)	7,764	11,966	13.6%	17.6%	420	4.3%
Damascus (Part)	762	1,814	1.3%	2.7%	105	8.7%
Unincorporated Area	48,376	54,308	85.0%	79.7%	593	1.2%
Non-Contiguous Areas	41	52	0.1%	0.1%	1	2.2%

*Data are compiled for 2010 boundaries.

Age Structure

A population pyramid illustrates the structure of age and gender of the given area by showing the percentages, or shares, of the total population. The population pyramid for CCSD#1 exhibits an aging of the population (Chart 6). The age groups 55 years and older show the highest increase. Although the share of the ages 40-44 group significantly decreased from 2000 to 2010, overall the share of population ages 18-64 remained almost stable. Children ages 0-17, experienced a decrease over the period by almost 2 percentage points. The median age in CCSD#1 increased from 34.8 years to 37.6 years in 2010.

Chart 6.



Source: U.S. Census, 2000 and 2010

Race and Ethnicity

In terms of racial/ethnic composition, CCSD#1 is predominantly white, non-Hispanic (76.0% in 2010). However, this is considerably less than in Clackamas County as a whole, and the share that this group represents of the total population declined substantially from 2000 (by 8 percentage points). Moreover, the 2010 white non-Hispanic share of population in CCSD#1 is 9 percentage points lower than the share in Clackamas County.

All the ethnic minority population groups in CCSD#1 experienced an increase from 2000 to 2010. The racial/ethnic group that underwent the most significant increase during the period was Hispanics (+105%), followed by Asians/Pacific Islanders (+90%). They represented 10 percent and 9 percent of the total population in 2010, respectively.

Table 6. Race/Hispanic Origin in CCSD#1

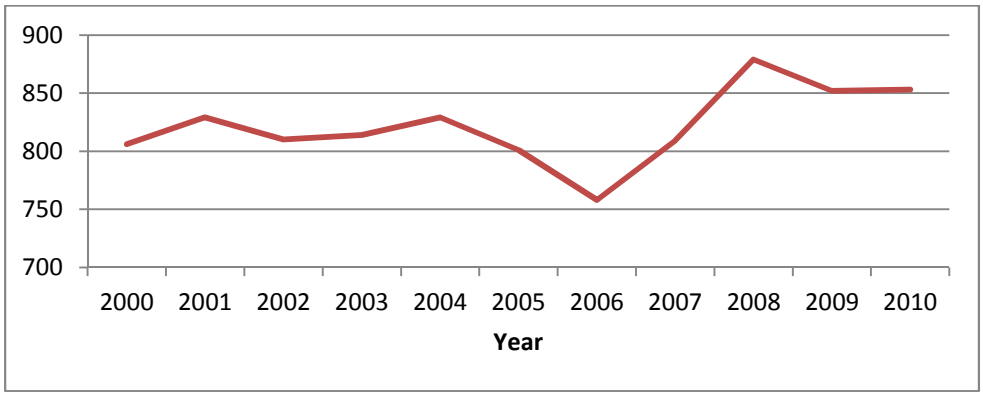
CCSD#1	2000	2010	2000 Share	2010 Share	# Change	% Change
White	47,856	51,763	84.0%	76.0%	3,907	8.2%
Black	725	980	1.3%	1.4%	255	35.2%
Native American	317	413	0.6%	0.6%	96	30.3%
Asian/Pacific Islander	3,177	6,024	5.6%	8.8%	2,847	89.6%
Other, including 2 or more races	1,557	2,176	2.7%	3.2%	619	39.8%
Hispanic	3,311	6,784	5.8%	10.0%	3,473	104.9%
Total	56,943	68,140	100.0%	100.0%	11,197	19.7%

Source: 2000 and 2010 Census

Births and Fertility

Since 2000, there have been between 751 and 879 births each year in CCSD#1 with a slight upward trend (Chart 7). The number of women of childbearing ages increased from 2000 to 2010 by around 1,600, which explains the increase in the number of annual births.

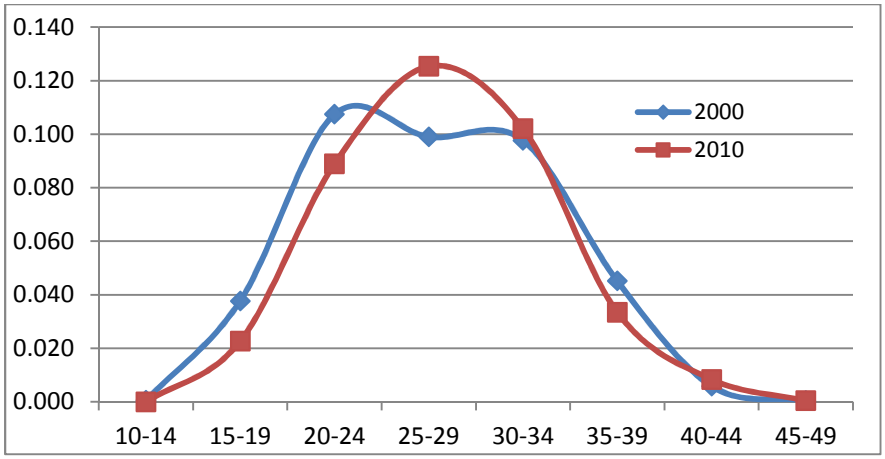
Chart 7. Number of Births - CCSD#1



Source: Center for Health Statistics, Oregon Health Services Department

The total fertility rate in CCSD#1 was 1.88, which is a decline from 2000 (1.95). This means that the average number of births each woman is bearing decreased. The chart below shows the age-specific fertility rates – that is it shows the number of births per woman by age of mother.

Chart 8. CCSD#1: Age Specific Fertility Rates



Source: Center for Health Statistics, Oregon Health Services Department

Housing and Households

The growth rates for housing differ slightly than growth rates for the corresponding population, which is because the numbers of housing units are smaller than the number of persons.

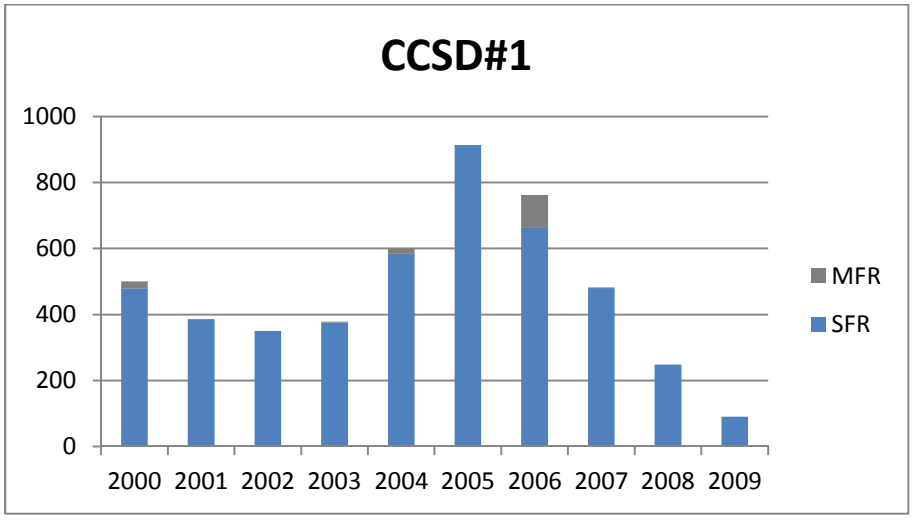
Additionally, the differences in the average number of persons per household and occupancy rates affect the growth rate of households. However, the overall pattern of population and housing change is relatively similar.

The total number of housing units increased 21 percent from 23,041 in 2000 to 27,884 in 2010. The occupancy rate was 93.5 percent in 2010. The number of households reached 26,083 in 2010, most of which are family households (67.8%). The average household size remained about the same in 2010 as in 2000 (2.6). Very few CCSD#1 residents live in group quarters facilities – only 450 persons resided in group quarters in 2010.

From 2000 to 2010, CCSD#1 added about 4,850 new housing units. This growth represents an average annual addition of about 485 housing units. However, construction of housing units in CCSD#1, as in most of Oregon and the U.S., was greater at the beginning of the decade than toward the end. The economic recession is the general reason for the decline in the number of new housing units added annually, but new units are still being constructed and occupied.

About 71 percent of housing units in CCSD#1 are single-family units (SFR). Housing construction in most years during the 2000s was SFR, but around 3 percent of new housing was multi-family residences (MFR). More MFRs were built in the second part of the decade than in the first.

Chart 9: CCSD#1: New Housing Units Built



Source: Metro RLIS Taxlot Data, August 2011

In 2010, 63.3 percent of occupied housing units were owner-occupied. This share decreased slightly from 2000. Renter occupied housing units have grown slowly over the time period and currently make 36.7% in 2010.

In 2010, 93.5 percent of housing units were occupied in CCSD. This is a decline of nearly one percentage point from 2000. This increase in housing vacancy is a statewide and national trend. The occupancy rate of all households in CCSD#1 is about a half of a percentage point higher than the rate for Clackamas County, which was 92.9 percent in 2010.

About 99 percent of TCSDs population resides in households and only one percent (approximately 450 persons only) is in group quarters facilities (such as nursing homes, prisons, and dormitories). In general, the share of population in an area that resides in group quarters does not change much over time. However, in CCSD around 210 more persons were living in group quarters in 2010 than in 2000 (a 90 percent increase), but the share of persons in households remained about the same because of the overall increase in total population.

About 63 percent of households in CCSD#1 are occupied by homeowners and 37 percent by renters. These shares of housing tenure did not change much from 2000 to 2010. The percentage

of renter occupied households is greater in CCSD#1 than in Clackamas County (69%) and increased by 1.5 percentage points during the decade.

The average number of persons that occupy a household (PPH), or household size, is influenced by several factors. The age and racial/ethnic composition of a population provides some indication of the size of an area's PPH. A high share of elderly population versus the share of married couples and growing families yields a small PPH due to the propensity of the elderly to live alone; whereas, higher PPH may be attributed to the tendency of some racial/ethnic groups to have larger or extended families, or to share housing. Changes in an area's fertility rates also have bearing on changes in PPH. An increase in PPH is supported by higher fertility. A stable PPH could mean that the population composition, and the number of births is stable; but it could also mean that an increase in the number of births and growing families is being offset by an increase in the elderly population.

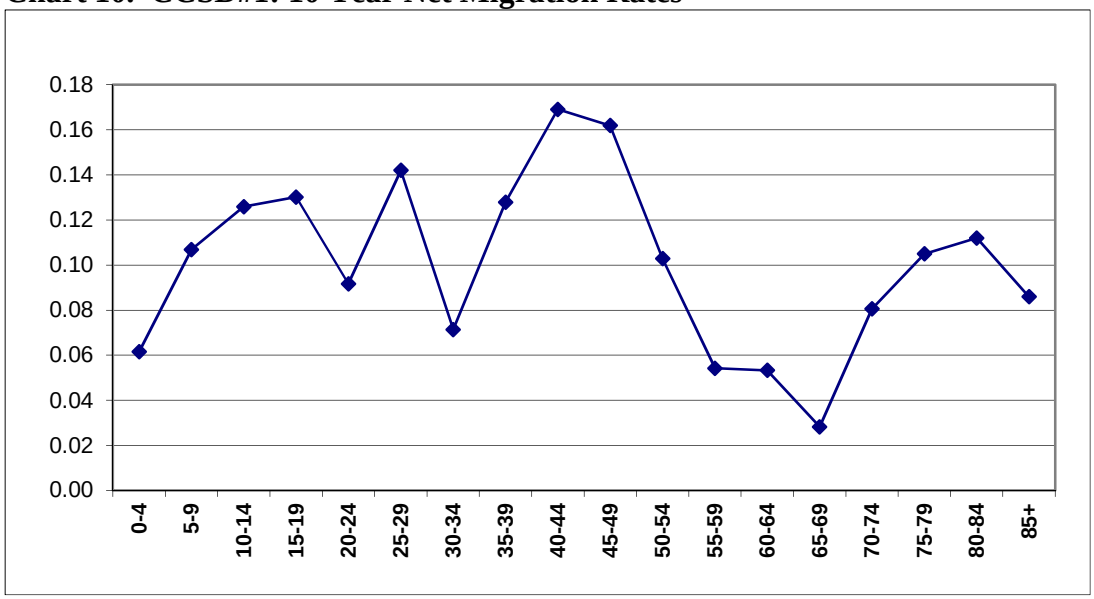
According to Census 2010, the PPH in CCSD#1 is 2.60, which is a decrease from 2.75 in 2000. The 2010 average household size in Clackamas County was slightly lower than in CCSD#1 at 2.56, which also underwent a slight drop from 2000.

By housing type, the PPH in single-family units (SFR) is typically higher than in multi-family residences or mobile homes. This is the case in CCSD#1 and the PPH for SFR was 2.75 and for MFR it was 2.34. The type of housing that is built influences the overall PPH of an area's population.

Migration

A migration rate is the number of net migrants per person in an area. In the last decade, most of the population growth in CCSD#1 was due to net in-migration among all age groups (Charts 10). This data underscores the rapid suburbanization occurring in the area as people have moved to newly developed areas of Sunnyside and Happy Valley. The data below shows net migration rates based on the inflow and outflow of persons age group to CCSD#1 from 2000 to 2010.

Chart 10. CCSD#1: 10 Year Net Migration Rates

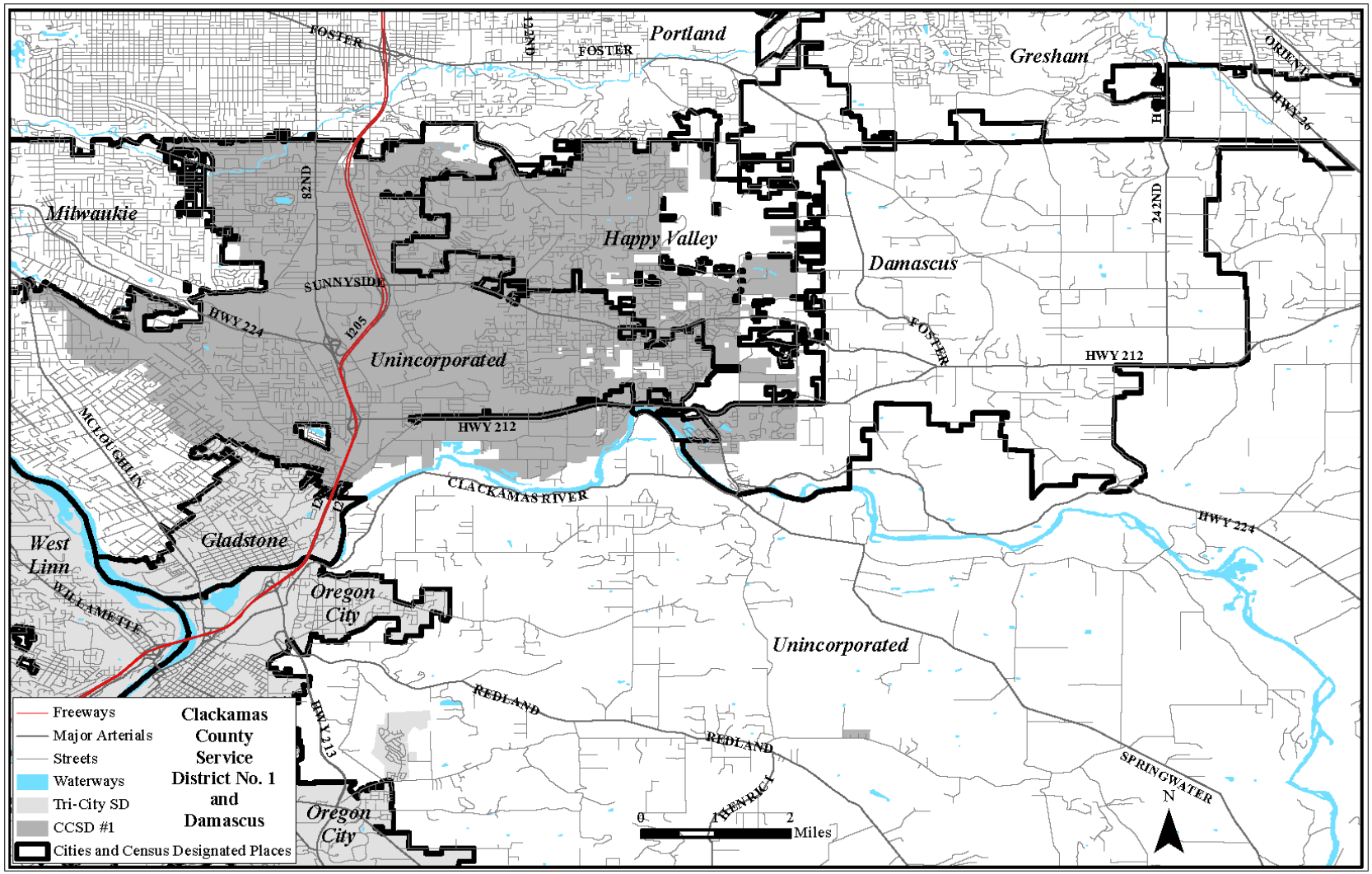


Source: US Census Bureau 2000-2010

Clackamas County Service District #1– With All of Damascus Included (CCSD#1D)

The City of Damascus is adjacent to CCSD#1 and is located to the east and southeast sides of the District. Currently CCSD#1 contains a small southwest portion of Damascus. Because of the possibility that the rest of Damascus be annexed into CCSD#1, a population forecast was prepared for CCSD#1 that includes the entire city. In this report, this study area with all of Damascus is designated as "Clackamas County Service District #1 All Damascus", or "CCSD#1D". The extent of CCSD#1 All Damascus covers an area of 38.6 square miles in Clackamas County, and adds 16.1 square miles to the existing CCSD#1. CCSD#1D is surrounded by Gresham in the north and by unincorporated Clackamas County in the south and east (Figure 4).

Figure 4. CCSD#1D with All of Damascus Included



Population

That part of Damascus that is outside the current CCSD#1 ("outer Damascus") adds 8,725 persons to the district's population. This addition brings CCSD#1D's total population to 76,866 in 2010 and represents 20.4 percent of Clackamas County's population. CCSD#1D's average annual growth from 2000 to 2010 is around 1.8 percent, which about the same as CCSD#1(the addition of outer Damascus actually slightly lowers the annual growth rate of CCSD#1 by a minimal fraction of a percent. Also, the population density of the CCSD#1D All Damascus is 2,000 persons per square mile, which is a significantly lower than CCSD#1's population density of 3,010 persons per square mile. By including all of Damascus, the city's share of CCSD#1D population increases to 13.7 percent, which is close to the population share of Happy Valley of 15.6%. The share of population in the unincorporated area in CCSD#1D remains highest (as in CCSD) at 70.7 percent in 2010 (Table 7).

Given that Damascus is recently incorporated, its population likely will grow a bit more quickly in the next thirty years because of the development of infrastructure and urbanization resulting from being included in the Metro urban growth boundary. Growth in Damascus will, however, depend upon the planning process in the next few years.

Table 7. Population in CCSD#1D by Sub-area

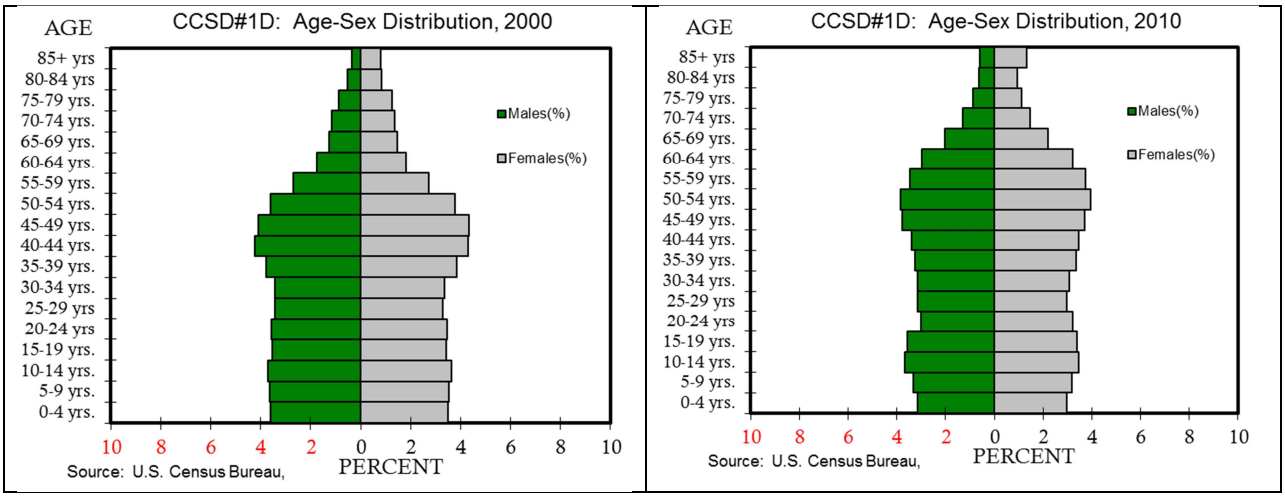
		Population		Share of Service District Population		# Avg. Annual Change	% Avg. Annual Change
	Area	2000 Census*	2010 Census	2000	2010		
Clackamas County Service District (CCSD2) - All Damascus Included		64,536	76,866			1,233	1.8%
	Happy Valley (Part)	7,764	11,966	12.0%	15.6%	420	4.3%
	Damascus (All)	8,355	10,539	12.9%	13.7%	218	2.3%
	Unincorporated Area	48,376	54,308	75.0%	70.7%	593	1.2%
	Non-Contiguous Areas	41	52	0.1%	0.1%	1	2.4%

*Data are compiled for 2010 boundaries.

Age Structure

The addition of outer Damascus will change the age structure of the district (Chart 11). The median age of outer Damascus is 46 years in 2010 compared to 33.1 years in inner Damascus, so this makes the population of CCSD#1D slightly older than CCSD#1.

Chart 11.



Race and Ethnicity

The racial composition (the shares of racial/ethnic groups) in outer Damascus is a little different than in CCSD#1, thus the composition in CCSD#1D is similar, but not identical to CCSD#1. The share of white non-Hispanics is slightly higher in CCSD#1D, although it experienced a significant decrease from 85.2 percent in 2000 to 77.6 percent in 2010. This decrease was a bit lower in magnitude than in CCSD#1. There was an increase during the same time period of persons in all ethnic minority groups. The share that Hispanics represent in CCSD#1D experienced the highest growth – they increased from 5.4 percent in 2000 to 9.3 percent in 2010, growing by 105 percent which is about the same magnitude of growth as in CCSD#1 (Table 8).

Table 8. Race/Hispanic Origin in CCSD#1D

CCSD#1 with All Damascus (CCSD#1D)	2000	2010	2000 Share	2010 Share	# Change	% Change
White	54,982	59,654	85.2%	77.6%	4,672	8.5%
Black	736	1,027	1.1%	1.3%	291	39.5%
Native American	360	458	0.6%	0.6%	98	27.2%
Asian/Pacific Islander	3,303	6,255	5.1%	8.1%	2,952	89.4%
Other, including 2 or more races	1,682	2,350	2.6%	3.1%	668	39.7%
Hispanic	3,473	7,121	5.4%	9.3%	3,648	105.0%
Total	64,536	76,865	100.0%	100.0%	12,329	19.1%

In outer Damascus, the greatest percentage change of minority ethnic groups from 2000 to 2010 was to Blacks (an increase of over 300 percent!). However, the numbers are small in this group. The ethnic minority groups in outer Damascus with the highest change in numbers during the decade were Hispanics and Asians/Pacific Islanders.

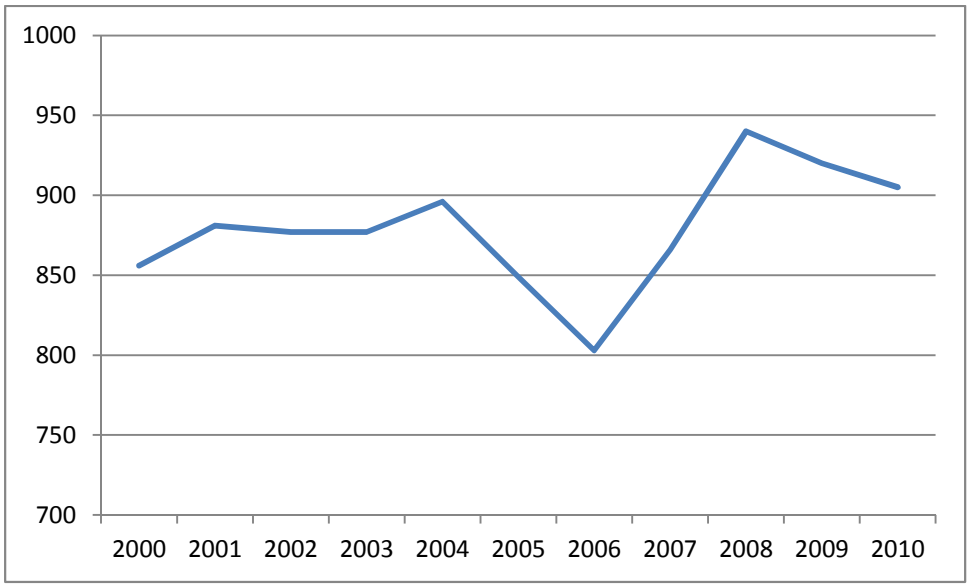
Table 9. Race/Hispanic Origin in Damascus Outside CCSD#1

Damascus Outside CCSD#1	2000	2010	2000 Share	2010 Share	# Change	% Change
White	7,126	7,891	93.8%	90.4%	765	10.7%
Black	11	47	0.1%	0.5%	36	327.3%
Native American	43	45	0.6%	0.5%	2	4.7%
Asian/Pacific Islander	126	231	1.7%	2.6%	105	83.3%
Other, including 2 or more races	125	174	1.6%	2.0%	49	39.2%
Hispanic	162	337	2.1%	3.9%	175	108.0%
Total	7,593	8,725	100.0%	100.0%	1,132	14.9%

Births and Fertility

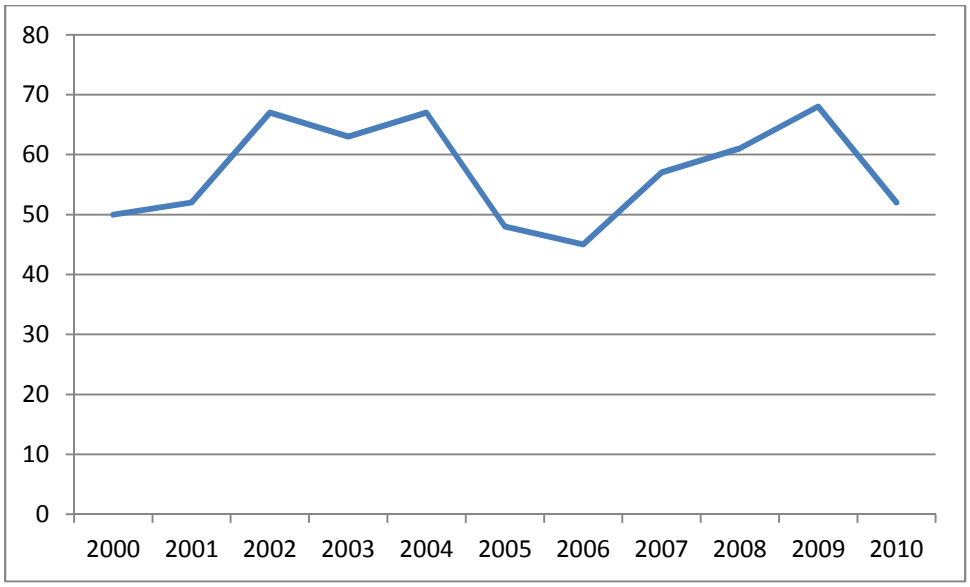
About 60 percent of Damascus births are occurring in the portion outside CCSD#1. The addition of outer Damascus is 50 to 70 births each year during 2000-2010 to CCSD#1.

Chart 12. Births: CCSD#1 All Damascus



Source: Center for Health Statistics, Oregon Health Services Department

Chart 13. Births: Damascus outside CCSD#1

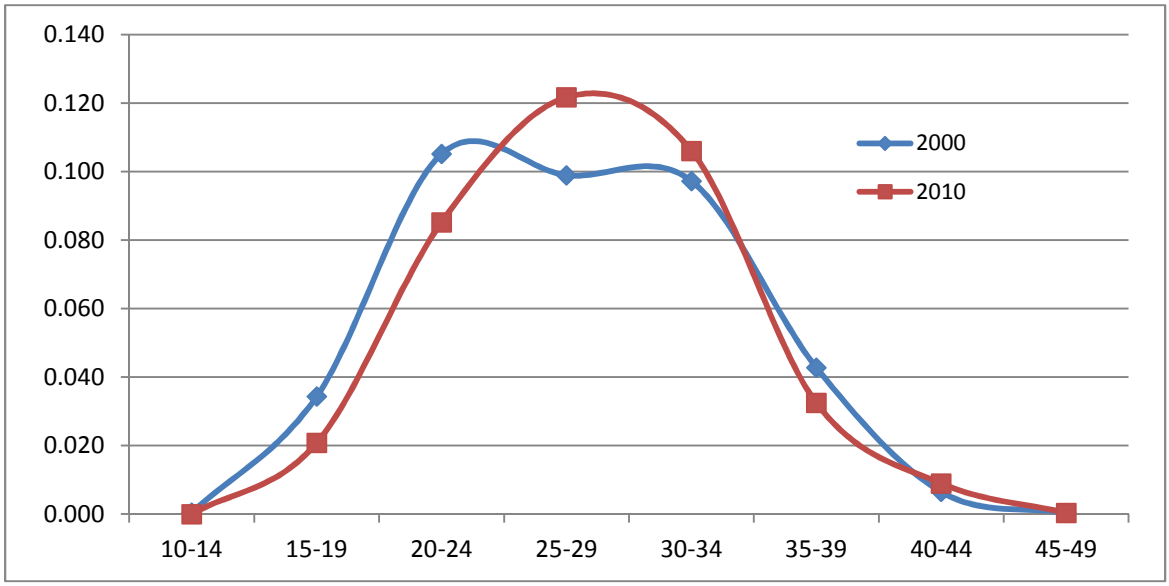


Source: Center for Health Statistics. Oregon Health Services Department)

The total fertility rate in CCSD#1D is 1.88, meaning that the average woman bears 1.88 children by the end of her child-bearing years (Chart 14). The addition of outer Damascus actually lowers the total fertility rate for CCSD#1D compared to that of CCSD#1. However, the fertility rate for women ages 30-34 is higher in outer Damascus than CCSD#1. Still outer Damascus is lightly populated, and the share of women of child-bearing ages in outer Damascus is lower than in

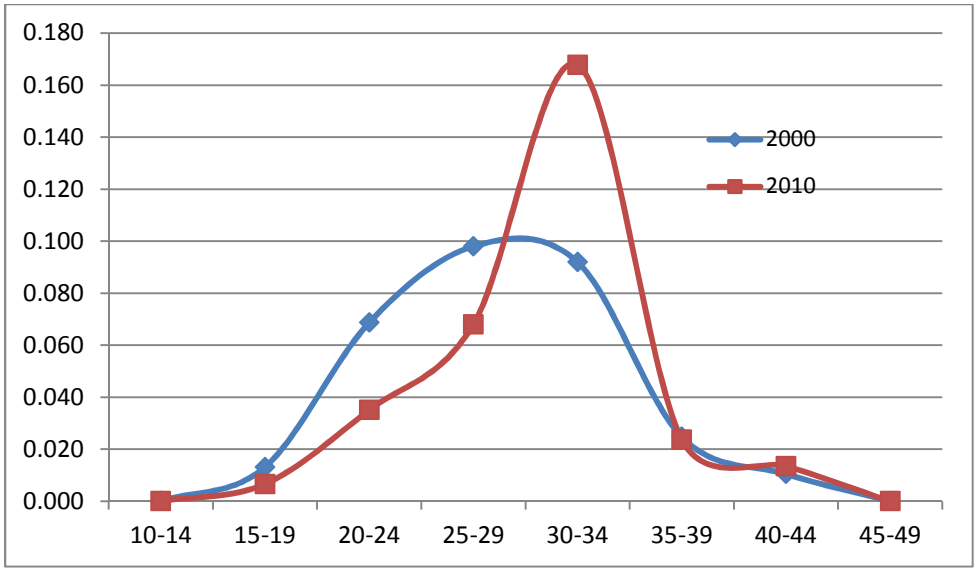
CCSD#1, so the number of births in this area won't have a huge impact on overall population growth in CCSD#1D.

Chart 14. CCSD#1 All Damascus: Age Specific Fertility Rate



Source: Center for Health Statistics. Oregon Health Services Department

Chart 15. Damascus Outside CCSD#1: Age Specific Fertility Rate



Source: Center for Health Statistics. Oregon Health Services Department

Housing and Households

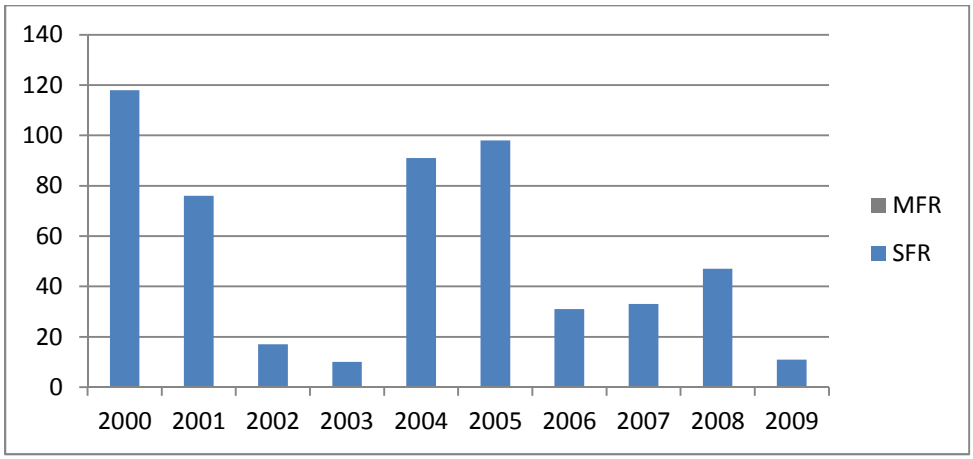
In CCSD#1D, the total number of housing units in 2010 is 31,201, or about 3,200 higher than in CCSD#1. About 94 percent of housing units are occupied, about the same as in CCSD#1. Most

are family households – 84 percent – which is about 16 percentage points higher than CCSD#1. Outer Damascus brings a larger share of owner occupied units into CCSD#1D because owner occupancy is 94 percent (in 2010). There were only 22 residents living in group quarters facilities in outer Damascus in 2010. The percentage of persons in CCSD#1D residing in group quarters facilities is only a fraction of one percent – there were only 468 group quarters residents in CCSD#1D in 2010.

The average household size (PPH) in outer Damascus is higher than in CCSD#1, and only slightly decreased from 2.91 in 2000 to 2.87 in 2010. Thus, the PPH for CCSD#1D dropped also, from 2.64 in 2000 to 2.62 in 2010.

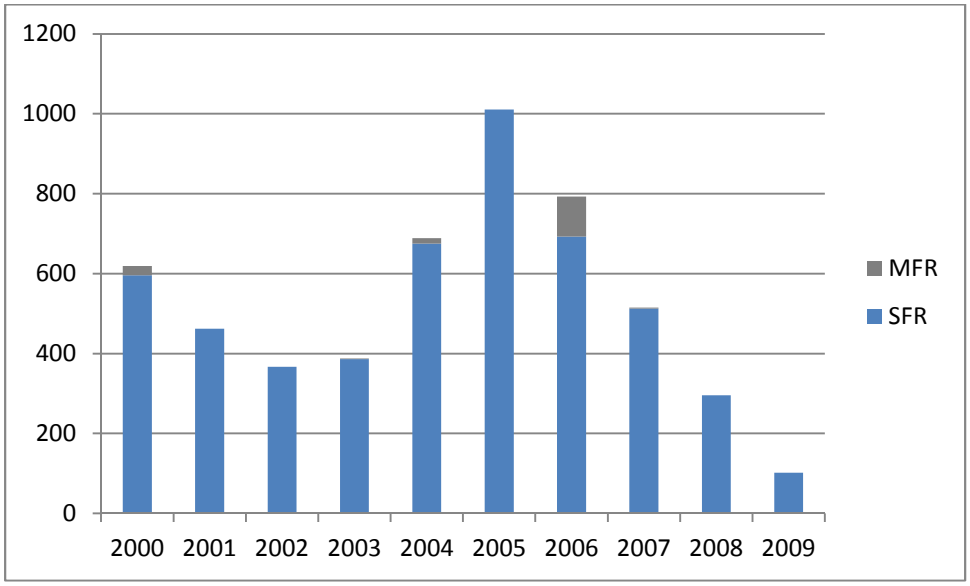
Metro's RLIS data for Outer Damascus for single family residential (SFR) and multi-family residential (MFR) housing show that the number of units built each year from 2000-2009 has decreased from 118 new units in 2000 to less than 15 in 2009. No MFRs were built from 2000 onwards in outer Damascus, and MFRs make only 4.2% of the total current housing stock in the area. Charts 16 & 17 below show the trends of annual housing units built in Outer Damascus and in CCSD#1D. The addition of outer Damascus increases the SFR housing stock of CCSD#1, but doesn't make any significant impact on the MFR housing stock.

Chart 16. Outer Damascus: New Housing Units



Source: Metro RLIS Taxlot Data, August 2011

Chart 16. CCSD#1D All Damascus: New Housing Units

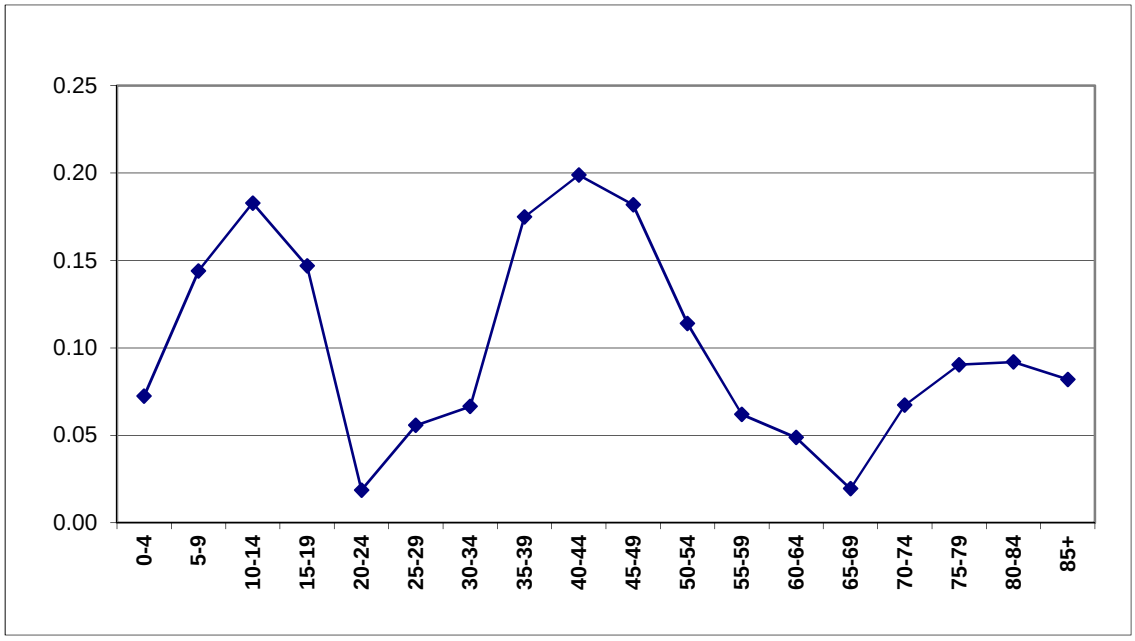


Source: Metro RLIS Taxlot Data, August 2011

Migration

CCSD#1D's migration pattern is very similar to CCSD#1's. In CCSD#1D, net in-migration of persons in all age groups occurred from 2000 to 2010. The only remarkable difference is that the net in-migration of persons aged 20 to 24 years in CCSD#1D is much lower than in CCSD#1.

Chart 18. CCSD All Damascus10-yr Net Migration Rates

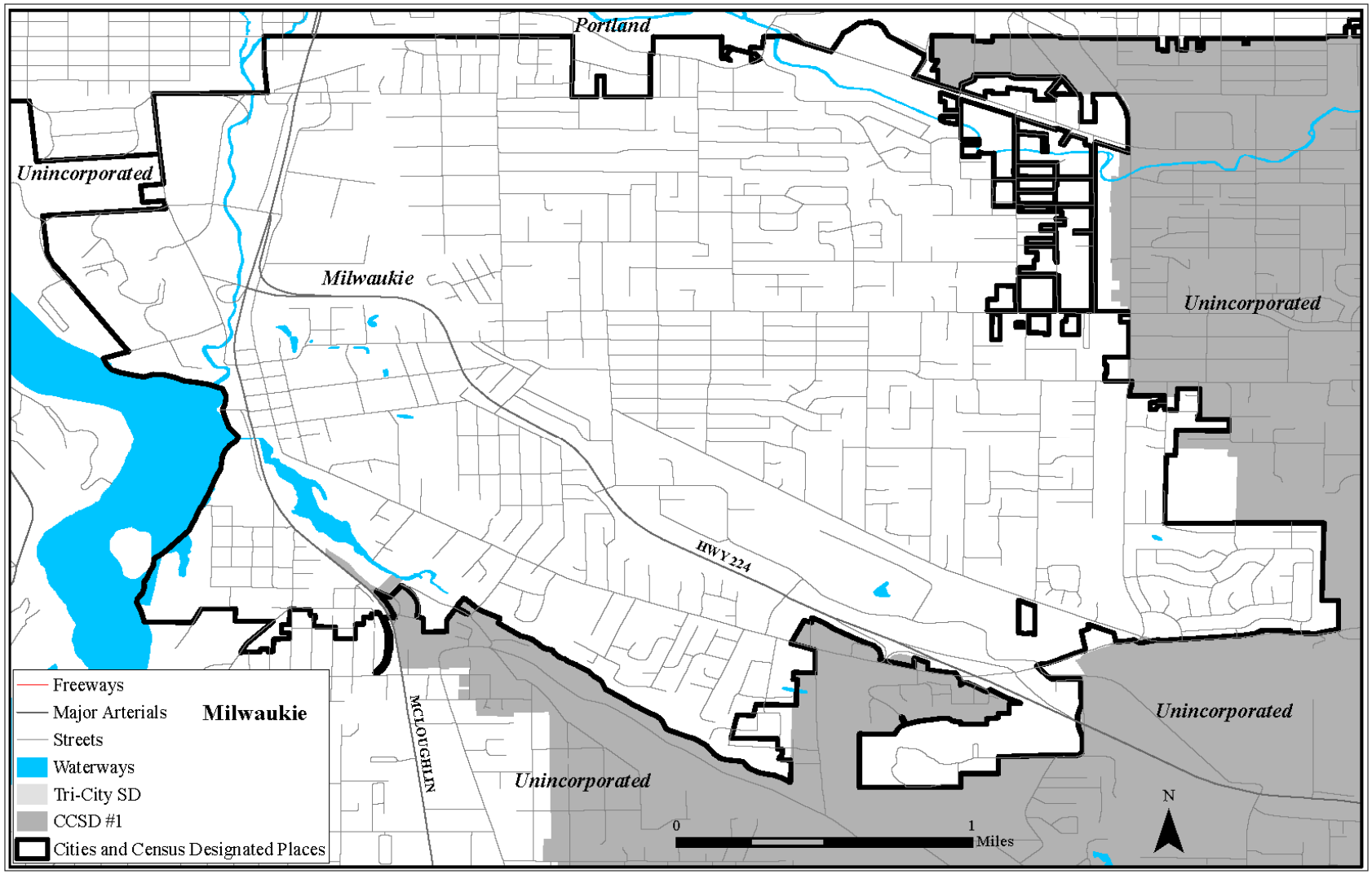


Source: US Census Bureau 2000-2010

The City of Milwaukie

Milwaukie covers 4.8 square miles of Clackamas County and is surrounded by Portland in the north and by the unincorporated Clackamas County on all other sides (Figure 5).

Figure 5. City of Milwaukie



Population

Milwaukie has a total population of 20,291 in 2010, which is 5.4 percent of the County's population. During 2000-2010, Milwaukie, as an 'under-the-radar' suburb of Portland, did not experience the population and housing growth as in other parts of Clackamas County. In fact, over the decade, Milwaukie underwent a slight decrease in population by an average of 24 persons per year. The population density for the City of Milwaukie was 4,183 persons per square mile in 2010, which is highest of all four study areas. When including all sub-areas, Milwaukie is second in density to the portion of Damascus inside of CCSD#1.

According to data submitted to PRC's Population Estimates Program by the City of Milwaukie and Oregon's Secretary of State's Office, in 2011 an annexation occurred that brought over 100 additional residents into the city. The 2011 certified population estimate for Milwaukie is 20,400, which is an increase of 110 since Census 2010. Even though Milwaukie did not increase in population from 2000 to 2010, there is an indication that population in this community in the Metro Portland area will continue to increase in the future, although at mild annual rates.

Table 10. Population in the City of Milwaukie

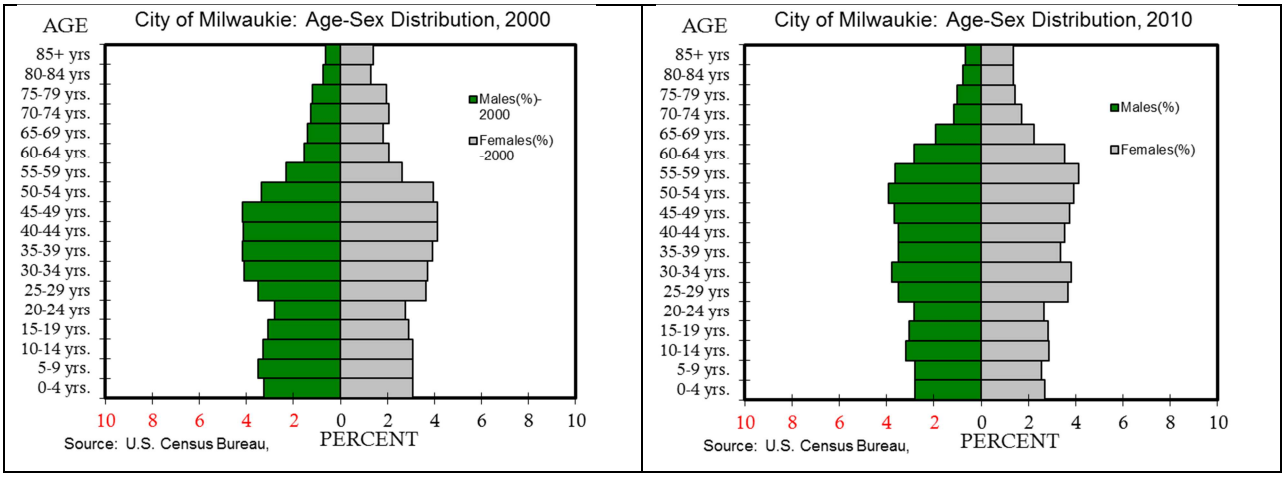
	Population		**Share of County Population**		**# Ave Annual Change**	**% Ave Annual Change**
Area	2000 Census*	2010 Census	2000	2010		
Milwaukie	20,535	20,291	6.1%	5.4%	(24)	-0.1%

*Data are compiled using 2010 boundaries

Age Structure

The median age of the city is 39.9 years in 2010, which is an increase from 37.6 in 2000. Over the decade, the share of children's population in Milwaukie decreased by 2 and a half percentage points to 20.4 percent in 2010, and the share of persons ages 18-64 increased by about the same amount to 65.9 percent. The share of seniors (ages 65 and older) remained stable (13.6%).

Chart 19.



Race and Ethnicity

The majority of Milwaukie's population is comprised of white non-Hispanics (85.1%) in 2010, and the percentage is slighter higher than in the county (84.5%). However, the share of white non-Hispanic population in Milwaukie declined by about 6 percentage points from 2000, or by over 1,000 persons.

The share of population represented by ethnic minorities increased by 5 percentage points; and most of the increase was attributed to the increase in the number of Hispanics.

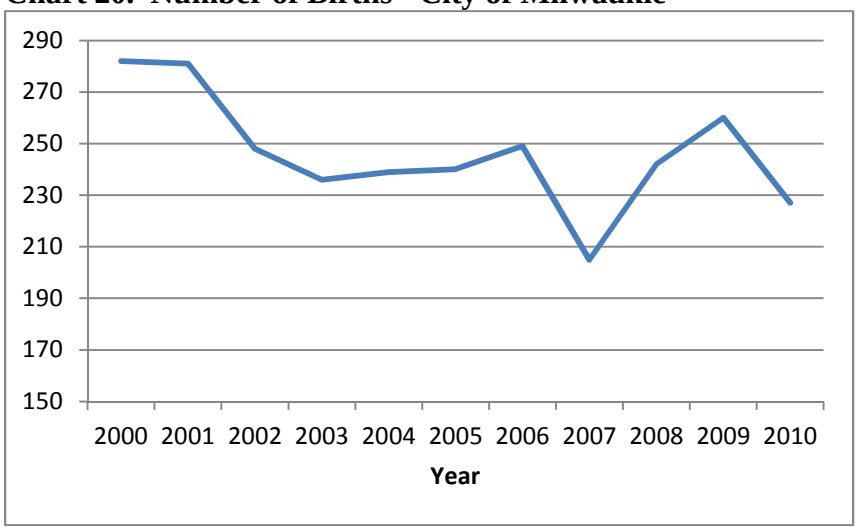
Table 11. Race/Hispanic Origin in the City of Milwaukie

City of Milwaukie	2000	2010	2000 Share	2010 Share	# Change	% Change
White	18,313	17,276	89.2%	85.1%	-1,037	-5.7%
Black	182	262	0.9%	1.3%	80	44.0%
Native American	171	164	0.8%	0.8%	(7)	-4.1%
Asian/Pacific Islander	533	551	2.6%	2.7%	18	3.4%
Other, including 2 or more races	523	612	2.5%	3.0%	89	17.0%
Hispanic	813	1,426	4.0%	7.0%	613	75.4%
Total	20,535	20,291	100.0%	100.0%	(244)	-1.2%

Births and Fertility

Since 2000, there have been between 227 and 285 births in Milwaukie each year. Over the decade, there has been a slight general downward trend in the number of annual births, although with some fluctuation.

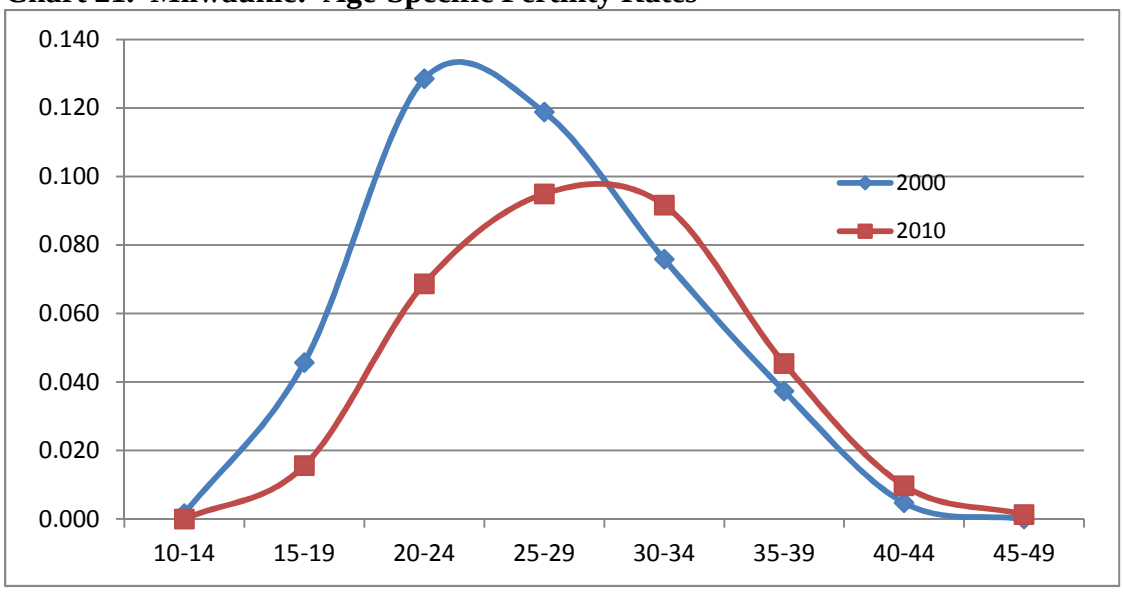
Chart 20. Number of Births - City of Milwaukie



Source: Center for Health Statistics, Oregon Health Services Department

The total fertility rate in Milwaukie in 2010 was 1.74, meaning that the average number of children a woman has is 1.74 by the end of her child-bearing years. The total fertility rate declined from 1.82 in 2000, which follows county, state, and national trends. The chart below shows overall lower fertility in 2010 compared to 2010 and the shift in rates by age-group of mother. Fertility rates in the younger age-groups dropped, while they increased by a smaller magnitude in the older age-groups.

Chart 21. Milwaukie: Age-Specific Fertility Rates

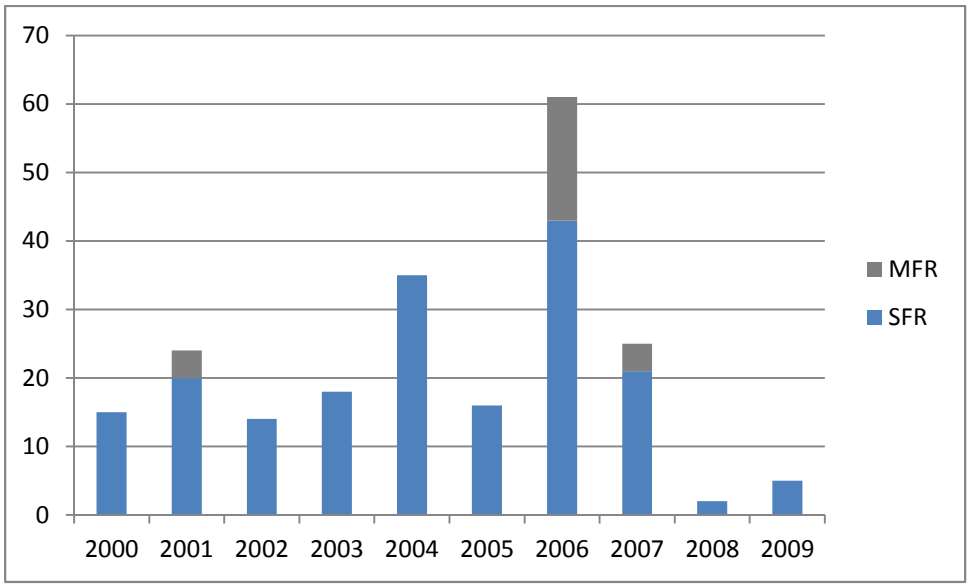


Source: Center for Health Statistics, Oregon Health Services Department

Housing and Households

From 2000 to 2010, Milwaukie added 129 new housing units. Most new units were constructed between 2000 and in 2006. Metro's RLIS data for the single family (SFR) and multi-family residential (MFR) housing show that the number of units built annually from 2000-2009 decreased after peaking in the middle of the decade (Chart 22). MFR construction rose significantly in 2006 but virtually disappeared after 2008. SFR construction also dwindled during the last few years of the decade. Currently, 70.6 percent of total housing units are categorized as SFR and 29.4 percent are categorized as MFR (which also includes manufactured homes).

Chart 22. SFR and MFR New Units Built in Milwaukie



Source: RLIS Taxlot Data, August 2011

In 2010, 94.8 percent of housing units were occupied in Milwaukie. This is the highest occupancy rate of all four study areas, although it did decline very slightly from 95.2 percent in 2000. The occupancy rate in Milwaukie is almost 2 percentage points higher than the rate for Clackamas County, which was 92.9 percent in 2010.

About 99 percent of Milwaukie's population resides in households and only one percent (215 persons) is in group quarters facilities (such as nursing homes, prisons, and dormitories). In general, the share of population in an area residing in group quarters does not change much overtime. However, in Milwaukie around 175 fewer persons were living in group quarters in 2010 than in 2000 (a 45 percent decline), and the share of persons in households increased by a percentage point.

About 59 percent of households in Milwaukie are occupied by homeowners and 41 percent by renters. These shares of housing tenure changed only slightly 2000 to 2010 (by a decline of one percentage point). However, the percentage of renter occupied households is higher than in the other 3 study areas (by a several percentage points).

The average number of persons that occupy a household (PPH), or household size, is influenced by several factors. The age and racial/ethnic composition of a population provides some indication of the size of an area's PPH. A high share of elderly population versus the share of married couples and growing families yields a small PPH due to the propensity of the elderly to live alone; whereas, higher PPH may be attributed to the tendency of some racial/ethnic groups to have larger or extended families, or to share housing. Changes in an area's fertility rates also have bearing on changes in PPH. An increase in PPH is supported by higher fertility. A stable PPH could mean that the population composition, and the number of births is stable; but it could also mean that an increase in the number of births and growing families is being offset by an increase in the elderly population.

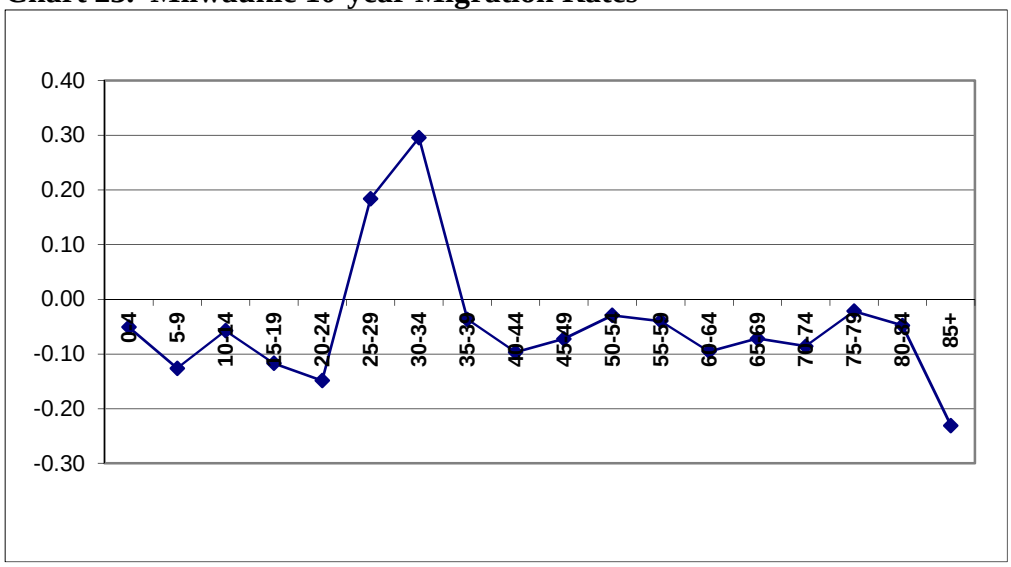
According to Census 2010, the PPH in Milwaukie is 2.32, which is a very slight decrease from 2.35 in 2000. The 2010 average household size in Milwaukie is significantly lower than in Clackamas County (2.56), is lower than the state (2.49), and is the lowest of the four study areas (all other study areas have a 2010 PPH of over 2.60).

By housing type, the PPH in single-family units (SFR) is typically higher than in multi-family residences or mobile homes. This is the case in Milwaukie and the high percentage of renters explains the low PPH.

Migration

A significant net in-migration of young adults ages 25-34 occurred in Milwaukee from 2000 to 2010. However, this was offset during the time period, by a net out-migration of all other age groups, although net out-migration rates were mild.

Chart 23. Milwaukie 10-year Migration Rates



Source: US Census Bureau 2000-2010

ASSUMPTIONS FOR FUTURE GROWTH AND POPULATION FORECASTS

The population of an area is determined by the number of births and deaths that occur in the area, and number of people moving in or out (net migrants). Of the demographic rates that influence population growth in Oregon, mortality rates change very little, and fertility rates are fairly stable – although they do vary more than mortality. Migration rates are more volatile as they are influenced by factors such as job and housing availability, and the economy.

Demographic Assumptions for the Population Forecasts

Regardless of how the economy performs, however, the very fast population growth during 1990s and most of the last decade across Oregon will likely not occur in the future at similar levels. First, the population is aging. An aging population means that the share of population that persons in the older age groups represent is becoming larger. While mortality rates decline minimally and the probability of dying declines a bit, the number of deaths does become greater in an aging population and has a significant negative effect on population growth. Secondly, fertility rates in the study areas are below replacement levels and so together with the aging population, natural increase (births minus deaths) has a weaker effect on increasing numbers. Positive population growth then becomes more and more dependent on net in-migration.

Specific Assumptions for Demographic Components:

Mortality

Mortality and life expectancy rates used in our study are those developed for Oregon. The change in future mortality rates and life expectancies in Oregon are assumed to follow the same pattern as the national projections developed by the U.S. Census Bureau. Mortality is projected to consistently decline ever so slightly and life expectancy is projected to improve. For Oregon, the life expectancy for males in 2008 was 76.9 years, and for females was 81.5 years. By 2040, life expectancy is projected to be 81.1 years for males and 85.2 years for females.

Although life expectancy increases, the magnitude of change in the mortality rates in each 5-year period is very small. Despite this slight decrease in mortality rates, the aging population will produce an increase in the number of annual deaths over the forecast period.

Fertility

Age-specific and total fertility rates for Oregon are assumed to follow similar national trends as detected in the fertility projections developed by the U.S. Census Bureau. After incorporating historical state trends, future fertility rates in Clackamas County are assumed to follow a similar pattern to Oregon. Our study assumes that current low fertility rates will continue in the short-term but rise in the long-term with increasing diversity and increase in immigrant population in the study areas. However, total fertility rate (TFR) in all four study areas will remain below state and county fertility rates and will remain below the replacement level TFR of 2.1.

Fertility rates will vary slightly during the forecast period. In general, for all study areas in the medium growth scenario, fertility is expected to decline slightly during the next few years but will rebound and stabilize during the rest of the period.

Migration

Migration is the most volatile and difficult component of population change to forecast. Both economic and social factors in and outside of an area affect the volume and flow of migration. Given the recent recession and current stagnant economy in the state and the study areas, population growth in all the study areas are expected to slow down during the 2010 to 2015 period. This slump is assumed to be followed by a bump in growth in the next 5 to 10 years and then taper off in the long run. However, population growth will remain positive in all study areas throughout the forecast period.

Migration will remain major component of growth in three of the four study areas: CCSD Part Damascus (CCSD#1), CCSD#1 All Damascus (CCSD#1D), and Tri-City (TCSD). Nearly two-thirds of the growth in the near term will come from net in-migration. However, by the end of the forecast horizon, net in-migration will account for all of the increases in population and will be needed to offset the natural decrease caused by the ageing population. The net migration rate (the number of net migrants per 1,000 persons) is assumed to stabilize after the year 2020. The City of Milwaukie saw a decline in population during the last decade. We do not expect a city like this to continue in the path of declining population. Therefore, we have assumed slow population growth for Milwaukie with a rate that decelerates over the forecast horizon. Net

migration is assumed to be small but positive and nearly all of the growth in Milwaukie will come from natural increase.

Population Forecasts

The population growth in the state, Clackamas County, and the four study areas will continue to increase over the forecast horizon, but at a slower pace than in the past couple of decades. The main reason for the slow growth will be due to the population aging, which will result in a slight negative natural population increase in all of the study areas except Milwaukie by 2040. The growth rates & trends in the forecast results for our study areas are consistent with those in the unpublished OEA forecast for Clackamas County accounting for changes in the economy since the county forecast was produced in 2006.

Forecast Scenarios

Population forecasts for TCSD, CCSD#1, CCSD#1 All Damascus, and Milwaukie were developed under three different growth scenarios: most-likely (medium), low, and high growth. The different growth assumptions - each suggest forecasts with continuing population increases but decelerating growth rates, and all assume annual growth rates lower at the end of the forecast horizon than in the beginning. The different scenarios are based on predictions of demographic trends in the study areas and how quickly the economy will recover since it receded in the later part of the 2000s. Local and regional economists concur that the economic climate (in the nation, state, and Clackamas County) will continue to improve, but the extent and pace of improvements is not certain.

Most of the difference between the low, medium, and high assumptions relies on the magnitude of curbing or exaggerating of the recent trends of net migration. The variation between the three growth scenarios become more pronounced after a few years. In the immediate two or three years, there are relatively small differences between the three forecasts, but by 2040, the differences are greater.

In each growth scenario, mortality rates are the most stable, fertility rates vary slightly, and net migration is assumed to vary the most. The medium (most-likely) growth scenario assumes that

the relatively high magnitude of growth in the past two decades will not continue during the forecast period.

All three growth scenarios assume that current mortality and fertility rates will not change much during the forecast period. All growth scenarios assume that fertility will decrease at the beginning of the forecast period and then turn around slightly before stabilizing. See Appendix 3 for fertility charts. Migration rates, a more difficult demographic factor to forecast than the other factors, are assumed to be a main factor affecting population changes in our study areas. In each of the three scenarios, net migration during 2010 to 2040 is predicted to differ slightly.

The population growth assumptions in all three scenarios developed for these forecasts indicate milder changes to future populations than those experienced during the 2000s. The demographic trends that led to robust population growth rates in the first half of the 2000s have lessened in magnitude during recent years and are not anticipated to rebound during the forecast period. The differences between the scenarios' assumptions represent varying magnitudes of net migration and very slight changes to fertility.

The **medium growth scenario** assumes that the current economic situation will take several years to recover and net migration will decrease before rebounding. Although there are overall increases in population during the forecast period, the levels of increase are not expected to return to rates seen in the 2000s. Natural increase becomes smaller and net migration climbs a bit in all study areas, except Milwaukie where there will be some fluctuation in these two components of population change.

In the **low growth scenario**, a slower recovery of the economy is implied and a lower net in-migration than in the medium growth scenario is continued. Fertility rates are also assumed to be slightly lower. Population increase is tempered and the effects of smaller natural increases are more evident in most time periods from 2010 to 2040.

Under the **high growth assumption**, the downward trends of recent years are assumed to rebound at a quicker pace than in the medium scenario, and a stronger recovery of the economy

leads to higher in-migration. In addition, higher fertility rates are assumed to occur, perhaps due to greater diversity of population groups than in the other two growth situations. In this case, larger increases are forecast for the study areas over the forecast horizon. By 2040, in this scenario, however, only slightly higher levels of net in-migration than during the 2000s are expected.

The highlights of the forecast results for each study area are mentioned below. The forecast populations are shown in the tables below. More detailed forecast results are included in Appendices 1 and 2.

Forecast Results

Tri-City Service District (TCSD)

In all scenarios from 2010 through 2040, population in Tri-City SD is forecasted to increase, but at slower rates as time progresses. The population in 2040 is expected to reach between 82,000 and 92,000 and will increase by between sixteen and thirty percent during the forecast period. This increase represents an average of 400 to 700 persons added each year.

Chart 24. TCSD: Population Forecasts

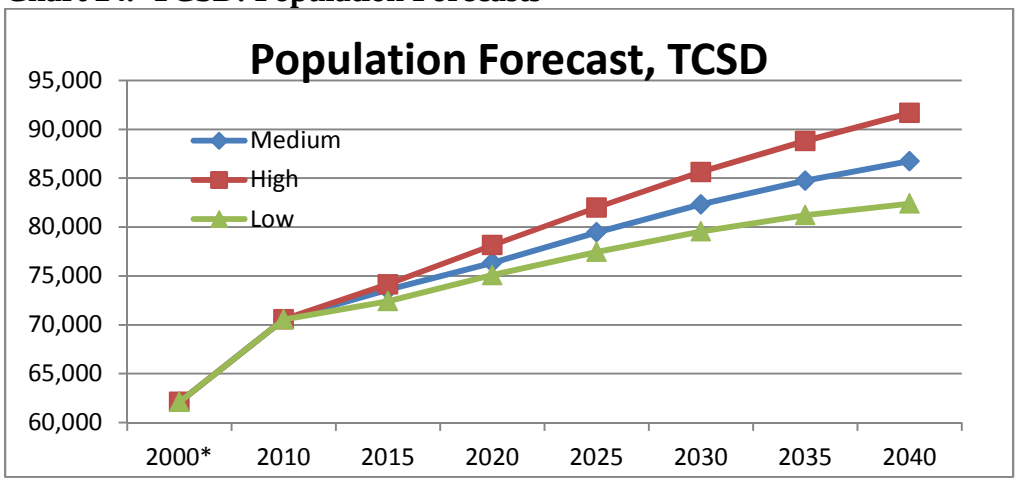
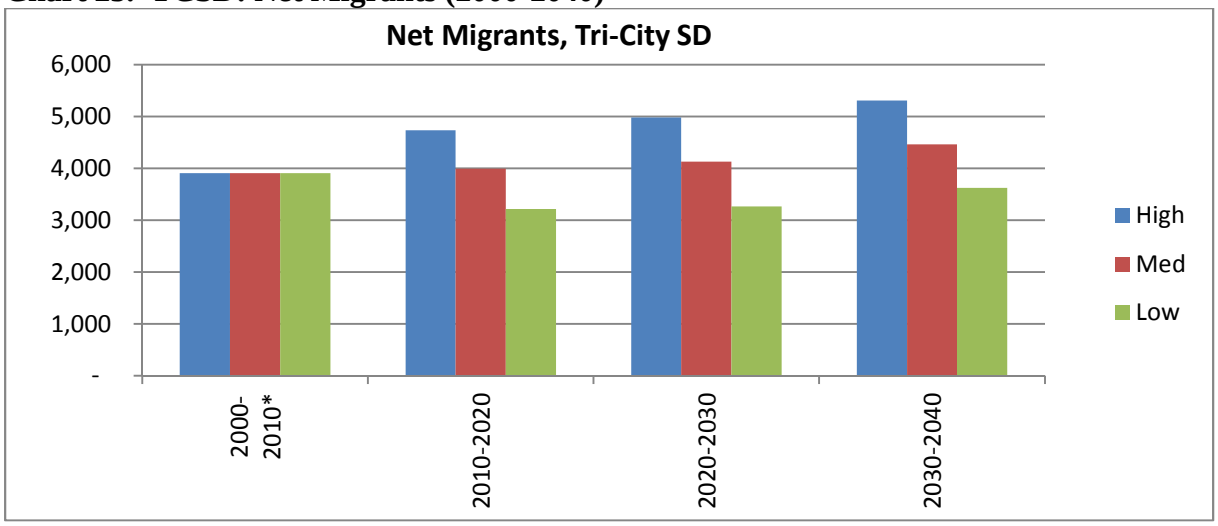


Table 12. TCSD: Population Forecasts and Annual Changes

TCSD	Census 2010	2020	2030	2040	2010-2040 Change		Average Annual Change	
					Number	Percent	Number	Percent
Med	70,544	76,340	82,315	86,748	16,204	23.0%	536	0.7%
Low	70,544	75,084	79,553	82,408	11,864	16.8%	392	0.5%
High	70,544	77,559	85,034	91,085	20,541	29.1%	679	0.8%

The number of net migrants in the medium and high growth will increase over the forecast horizon; the number of net migrants in the low growth scenario will decline overall, but with some fluctuation. The chart below show the number of net migrants during 2000-2010 and the number expected over each 10-year time period during the forecast.

Chart 25. TCSD: Net Migrants (2000-2040)



*Actual

Medium Growth (most-likely) Scenario

In the most-likely growth scenario, population is expected to increase by 23 percent reaching almost 87,000 in 2040. This increase of approximately 16,000 persons during the forecast period represents an average of 536 persons per year.

Although the number of net migrants will continually increase during the forecast horizon, the effects of a dwindling natural increase will bring the overall population growth rates down.

Table 13. TCSD: Medium Growth Scenario

TCSD Medium Growth		2010	2020	2030	2040
Population		70,544	76,340	82,315	86,748
Period Change			**2010-2020**	**2020-2030**	**2030-2040**
	Population Growth		5,796	5,975	4,433
	% Growth		8.2%	7.8%	5.4%
	Natural Increase		2,014	1,844	-31
	Net Migration		3,782	4,131	4,464

Low Growth Scenario

Under the low growth assumption, TCSD's population is predicted to increase by 17 percent, with approximately 12,000 more persons in 2040 than in 2010. This increase represents an average increase of almost 400 persons annually.

Under the low growth assumption, net migration doesn't change significantly over time forecast period, while natural increase becomes smaller overtime so that by the end of the period there are close to 100 more annual deaths than births.

Table 14. TCSD: Low Growth Scenario

TCSD Low Growth		2010	2020	2030	2040
Population		70,544	75,084	79,553	82,408
Period Change			**2010-2020**	**2020-2030**	**2030-2040**
	Population Growth		4,540	4,469	2,856
	% Growth		6.4%	6.0%	3.6%
	Natural Increase		1,536	1,206	-767
	Net Migration		3,004	3,263	3,623

High Growth Scenario

In the high growth scenario, around 20,500 more persons are predicted to reside in Tri-City SD in 2040 than in 2010. This gain in population over the 30-year period represents about a 29 percent increase, with an average of almost 1 percent per year (680 persons annually). Under this scenario, net migration increases and is higher at the end of the period than at the beginning in 2010. In addition, births outnumber deaths throughout the forecast horizon so that there is a continuous natural increase in the population.

Table 15. TCSD: High Growth Scenario

TCSD High Growth		2010	2020	2030	2040
Population		70,544	77,559	85,034	91,085
Period Change			**2010-2020**	**2020-2030**	**2030-2040**
	Population Growth		7,015	7,475	6,052
	% Growth		9.9%	9.6%	7.1%
	Natural Increase		2,495	2,497	744
	Net Migration		4,519	4,978	5,308

CCSD#1

Populations in CCSD#1 are forecasted to increase in all scenarios from 2010 through 2040, but at slower rates as time progresses. Population in 2040 is expected to reach between 88,000 and 97,500. Population is expected to increase by between 29 percent and 43 percent during the forecast period developed under all three forecast scenarios with an average of 660 to 970 persons added each year.

Chart 26. CCSD#1: Population Forecasts

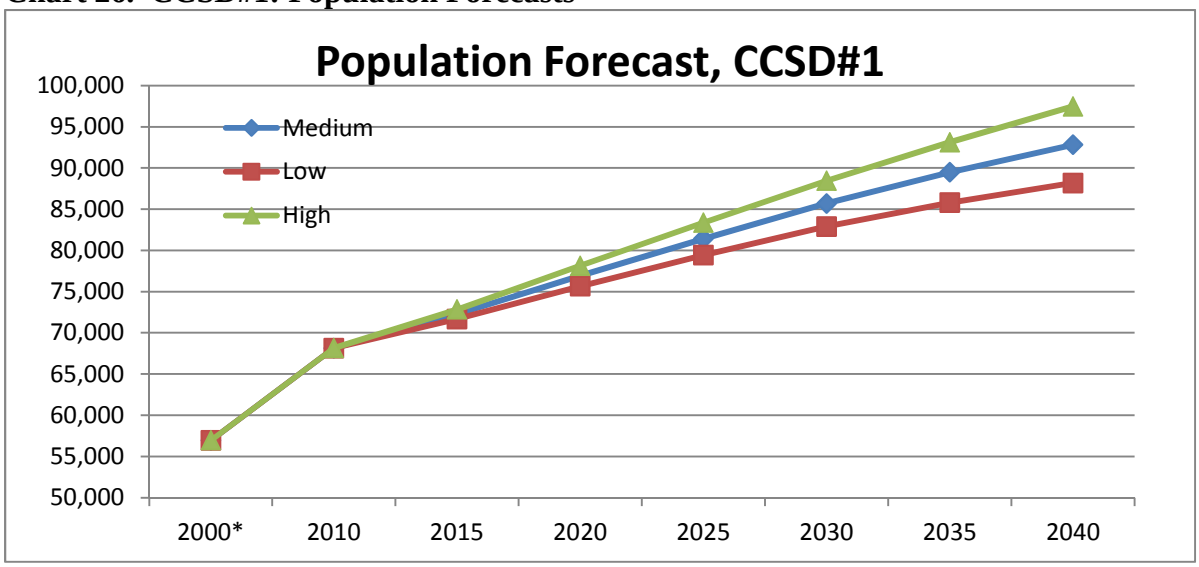
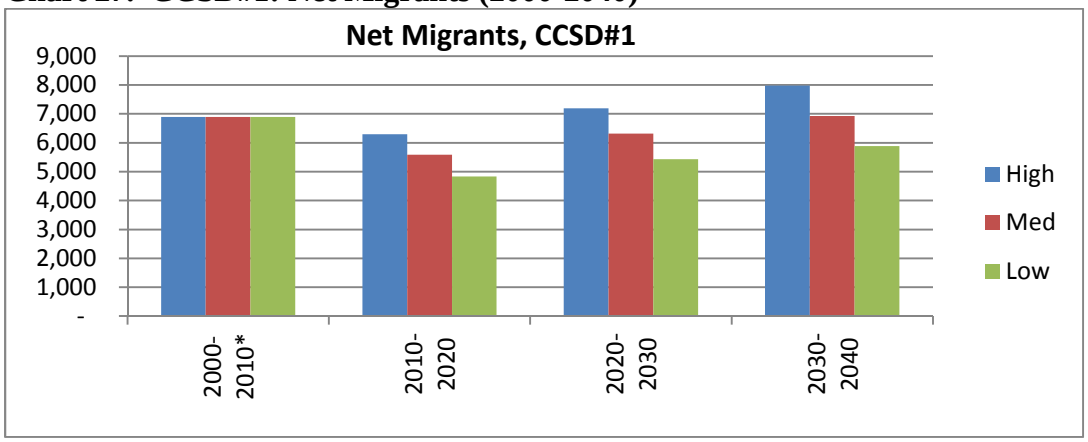


Table 16. CCSD#1: Population Forecasts and Annual Changes

CCSD#1	Census 2010	2020	2030	2040	2010-2040 Change		Average Annual Change	
					Number	Percent	Number	Percent
Med	68,140	76,912	85,689	92,818	24,678	36.2%	816	1.0%
Low	68,140	75,662	82,888	88,176	20,036	29.4%	662	0.9%
High	68,140	78,120	88,436	97,456	29,316	43.0%	969	1.2%

In all three growth scenarios, a decrease in the number of net migrants is expected at the beginning of the forecast period before rebounding in the years after. We anticipate that it will take time to gain the momentum to reach the levels of net in-migration that occurred during the 2000s.

Chart 27. CCSD#1: Net Migrants (2000-2040)



*Actual

Medium Growth (most-likely) Scenario

In the medium forecast for CCSD#1, population will reach almost 93,000 in 2040. This increase represents a change of 36 percent from 2010, which is slightly over an average growth of one percent per year.

Despite the moderate average annual growth of one percent over the forecast period, the magnitude of growth seen in the 2000s is not anticipated to occur again under the medium growth forecast and growth rates will continually decline during the forecast period. Although the number of net migrants is anticipated to increase, the amount of net migration will not be great enough to completely offset the impact of the decline in natural increase. Overall, the magnitude of population growth will diminish over the forecast period.

Table 17. CCSD#1: Medium Growth Scenario

CCSD#1 Medium Growth		2010	2020	2030	2040
Population		68,140	76,912	85,689	92,818
Period Change			2010-2020	2020-2030	2030-2040
	Population Growth		9,361	8,777	7,129
	% Growth		13.9%	11.4%	8.3%
	Natural Increase		3,177	2,456	204
	Net Migration		6,184	6,321	6,926

Low Growth Scenario

Under the low growth assumption, CCSD#1's population is predicted to increase by 29 percent, with around 20,000 more persons in 2040 than in 2010. The average annual population growth rate under this growth scenario will be less than one percent per year (660 persons added per year). Population added from natural increase is lower than in the most-likely forecast and toward the end of the forecast horizon, a natural decrease in population will occur. Net

migration during this period, however, is predicted to increase slightly so that decreases in total population will be avoided.

Table 18. CCSD#1: Low Growth Scenario

CCSD#1 Low Growth		2010	2020	2030	2040
Population		68,140	75,662	82,888	88,176
Period Change			2010-2020	2020-2030	2030-2040
	Population Growth		7,522	7,226	5,287
	% Growth		11.0%	9.6%	6.4%
	Natural Increase		2,681	1,800	-592
	Net Migration		5,430	5,427	5,879

High Growth Scenario

In the high growth scenario, almost 30,000 more persons are predicted to reside in CCSD#1 in 2040 than in 2010. This gain in population over the 30-year period represents a 43 percent increase, with an average of about 1.2 percent per year. Toward the end of the forecast period, net migration returns closer to rates experienced during the 2000s.

Table 19. CCSD#1: High Growth Scenario

CCSD#1 High Growth		2010	2020	2030	2040
Population		68,140	78,120	88,436	97,456
Period Change			2010-2020	2020-2030	2030-2040
	Population Growth		9,980	10,316	9,020
	% Growth		14.6%	13.2%	10.2%
	Natural Increase		3,676	3,126	1,042
	Net Migration		6,893	7,190	7,978

CCSD#1 All Damascus (CCSD#1D)

Populations in CCSD#1 All Damascus are forecasted to increase in all scenarios from 2010 through 2040, but at slower rates as time progresses. Population in 2040 is expected to reach between 100,700 and 111,300. Population is expected to increase by between 31 percent and 45 percent during the forecast period developed under all three forecast scenarios, adding an average of 790 to 1,140 persons each year.

Table 20. CCSD#1 All Damascus: Population Forecasts

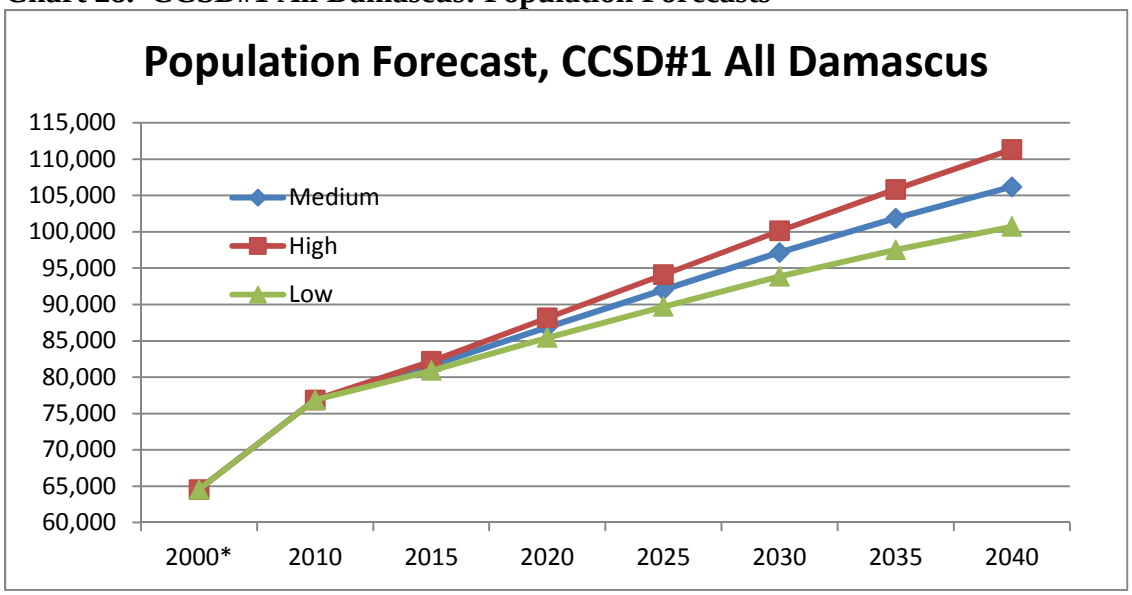
CCSD#1 All Damascus	Census 2010	2020	2030	2040	2010-2040 Change		Average Annual Change	
					Number	Percent	Number	Percent
Med	76,865	86,876	97,157	106,193	29,328	38.2%	970	1.1%
Low	76,865	85,438	93,857	100,718	23,853	31.0%	789	0.9%
High	76,865	88,168	100,136	111,323	34,458	44.8%	1,139	1.2%

Population growth in Damascus outside of the current CCSD#1 boundary is expected to grow at slightly higher rates than in the current CCSD#1. This area will bear around 10-15 percent of the population growth expected in the CCSD#1 All Damascus area. (In the 2000s, this area accounted for about one third of the population growth in all of Damascus and the population in this area is expected to increase by 40-60 percent from 2010 to 2040).

Table 21. Damascus outside CCSD#1: Population Forecasts

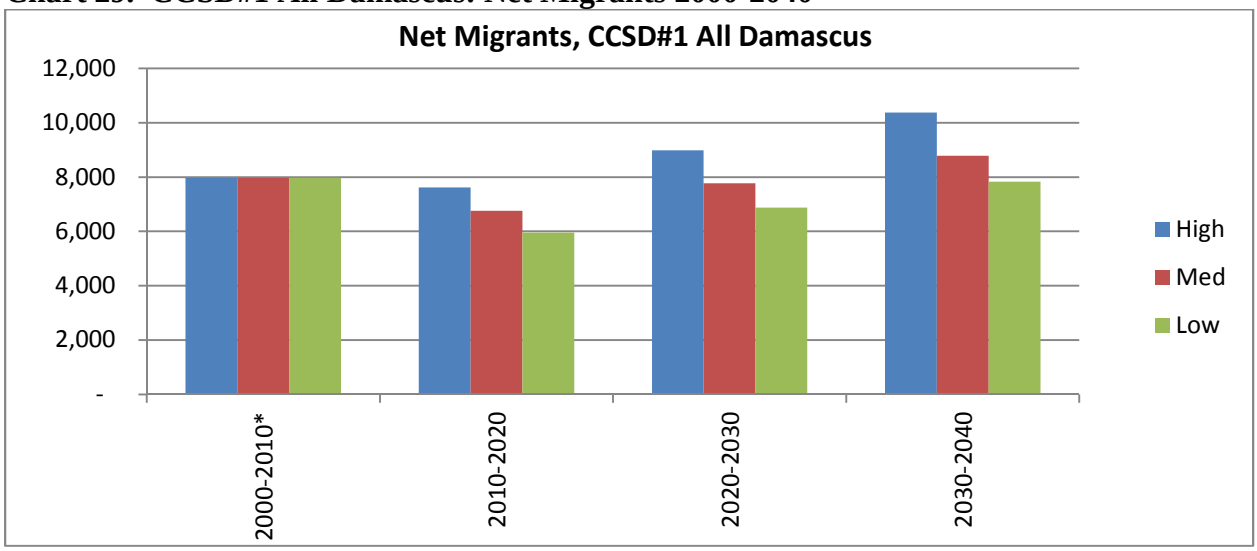
Damascus Outside CCSD#1	Census 2010	2020	2030	2040	2010-2040 Change		Average Annual Change	
					Number	Percent	Number	Percent
Med	8,725	9,964	11,469	13,375	4,650	53.3%	154	1.4%
Low	8,725	9,776	10,969	12,543	3,818	43.8%	126	1.2%
High	8,725	10,049	11,701	13,867	5,142	58.9%	170	1.5%

Chart 28. CCSD#1 All Damascus: Population Forecasts



The number of net migrants in CCSD#1 All Damascus is expected to decline over the next several years and then increase continually until 2040. By the end of the forecast period in the medium and high growth scenarios, net migration will surpass recent levels.

Chart 29. CCSD#1 All Damascus: Net Migrants 2000-2040



*Actual

Medium Growth (most-likely) Scenario

In the medium forecast, population will reach over 106,000 in 2040. This increase represents a change of 38 percent from 2010. Average annual growth of higher than one percent over the

forecast period is foreseen, and the magnitude of net migration seen in the 2000s is anticipated to occur again under by the end of the forecast period. Growth rates in the most-likely scenario will decline during the forecast period, however. Although the number of net migrants will increase, the amount of net migration will not be great enough to completely offset the impact of the decline in natural increase; and growth will lessen during the forecast period.

Table 22. CCSD#1 All Damascus: Medium Growth Scenario

CCSD#1 all Damascus Medium Growth		**2010**	**2020**	**2030**	**2040**
Population		76,865	86,876	97,157	106,193
Period Change			**2010-2020**	**2020-2030**	**2030-2040**
	Population growth		10,011	10,282	9,035
	% growth		13.0%	11.8%	9.3%
	Natural Increase		3,231	2,516	252
	Net Migration		7,369	7,766	8,783

Low Growth Scenario

In the low growth forecast, approximately 24,000 persons will be added to the population. This increase represents a 31 percent change from 2010, at an average annual rate of 0.89 percent. At this pace, an average just under 800 persons will be added per year.

The magnitude of population growth will decrease over time, and by the end of the forecast period, rates will be about half of those during the 2000s. In the last forecast time intervals, fewer births than deaths will occur. An increasing number of net migrants will help to temper declining growth rates, however.

Table 23. CCSD#1 All Damascus: Low Growth Scenario

CCSD#1 ALL Damascus Low Growth		2010	2020	2030	2040
Population		76,865	85,438	93,857	100,718
Period Change			2010-2020	2020-2030	2030-2040
	Population growth		8,573	8,419	6,861
	% growth		11.2%	9.9%	7.3%
	Natural Increase		2,591	1,547	-965
	Net Migration		6,571	6,872	7,826

High Growth Scenario

In the high growth scenario, almost 35,000 additional persons are predicted to reside in CCSD#1 in 2040 than in 2010. This gain in population over the 30-year period represents a 45 percent increase, at an average of about 1.2 percent per year. By the middle 30-year forecast period, net migration surpasses levels experienced during the 2000s.

Table 24. CCSD#1 All Damascus: High Growth Scenario

CCSD#1 ALL Damascus High Growth		2010	2020	2030	2040
Population		76,865	88,168	100,136	111,323
Period Change			2010-2020	2020-2030	2030-2040
	Population growth		11,303	11,968	11,187
	% growth		14.7%	13.6%	11.2%
	Natural Increase		3,659	2,978	811
	Net Migration		8,233	8,989	10,376

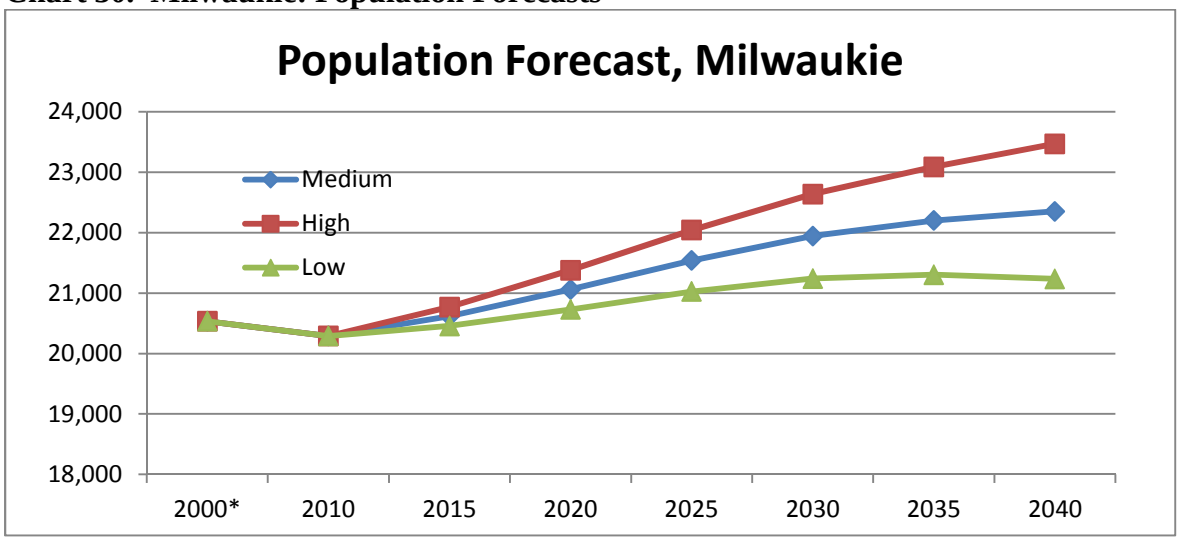
Milwaukie

Population in Milwaukie is forecasted to increase in all scenarios from 2010 through 2040, but at fluctuating and modest rates overtime. The mild population growth during the forecast period will be a turnaround from the population loss experienced in the 2000s (which was due to a net out-migration). Population decreases are not expected to continue in the future as natural increase and/or net-migration will generate growth. Population in 2040 is expected to reach between 21,250 and 23,500. Population is expected to increase between 5 percent and 16 percent during the forecast period developed under all three forecast scenarios, adding an average of 30 to 105 persons each year.

Table 25. Milwaukie: Population Forecasts

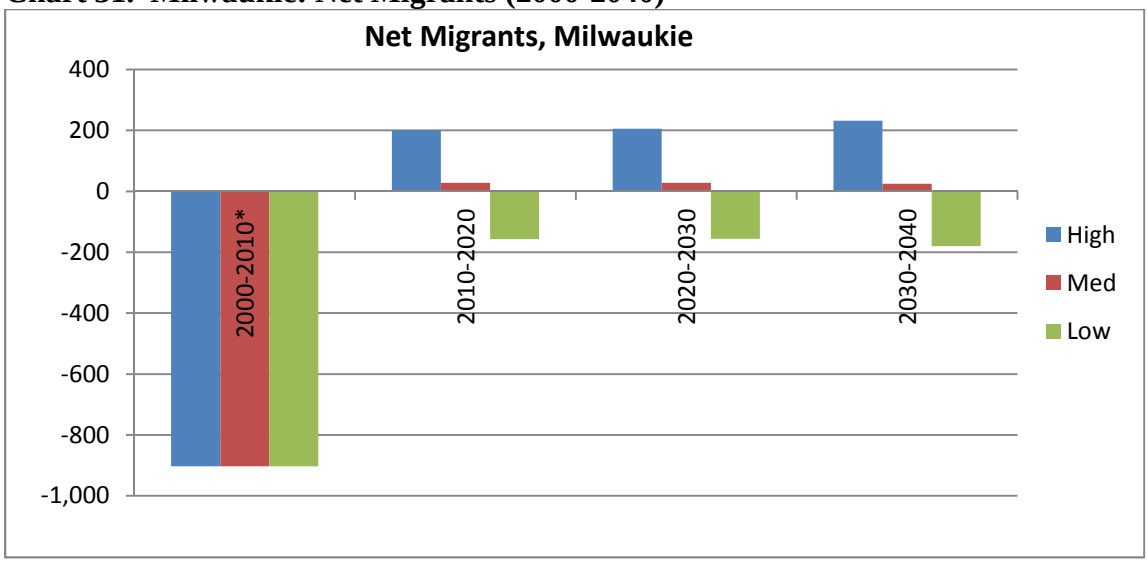
Milwaukie	Census 2010	2020	2030	2040	2010-2040 Change		Average Annual Change	
					Number	Percent	Number	Percent
Med	20,291	21,060	21,946	22,352	2,061	10.2%	68	0.3%
Low	20,291	20,730	21,242	21,235	944	4.7%	31	0.2%
High	20,291	21,379	22,638	23,471	3,180	15.7%	105	0.5%

Chart 30. Milwaukie: Population Forecasts



The number of net migrants varies from an average of 2 to 25 persons per year in the medium and high growth scenarios. In the low growth scenario, however, net out-migration is assumed at an average of 15-20 persons per year.

Chart 31. Milwaukie: Net Migrants (2000-2040)



*Actual

Medium Growth Scenario

In the medium forecast, population in Milwaukie will increase by 10 percent from 2010 to 2040. This increase represents an addition of 2,060 persons over the 30-year period. Average annual growth of a fraction of one percent over the forecast period is foreseen (0.32 percent). Although no dramatic change is expected during the forecast period, population growth rates will fluctuate some during the forecast period. Natural increase will be responsible for most of the population growth, and net in-migration will contribute to a smaller amount.

Table 26. Milwaukie: Medium Growth Scenario

Milwaukie Medium Growth		2010	2020	2030	2040
Population		20,291	21,060	21,946	22,352
Period Change			2010-2020	2020-2030	2030-2040
	Population growth		769	886	406
	% growth		3.8%	4.2%	1.8%
	Natural Increase		741	859	381
	Net Migration		28	28	25

Low Growth Scenario

In the low grow forecast for Milwaukie, population will increase by less than 1,000 from 2010 to 2040. This growth is at a meager average rate of 0.15 percent per year. Under this scenario, net out-migration attributes to the slow growth and over the forecast period, a net of around 500 persons will move out of Milwaukie. Overall, in the low growth forecast, population growth is attributed to natural increase. Toward the end of the forecast period, though, natural increase is not enough to prevent some slight declines.

Table 27. Milwaukie: Low Growth Scenario

Milwaukie Low Growth		2010	2020	2030	2040
Population		20,291	20,730	21,242	21,235
Period Change			2010-2020	2020-2030	2030-2040
	Population growth		439	512	-7
	% growth		2.2%	2.5%	0.0%
	Natural Increase		596	667	173
	Net Migration		-156	-156	-180

High Growth Scenario

In the high growth scenario, almost 3,200 more persons are predicted to reside in Milwaukie in 2040 than in 2010. This gain in population over the 30-year period represents a 16 percent increase, with an average rate of almost a half percent per year. Under this growth scenario, net in-migration is robust, and annually, an average of 105 persons is added to the population.

Table 28. Milwaukie: High Growth Scenario

Milwaukie High Growth		2010	2020	2030	2040
Population		20,291	21,379	22,638	23,471
Period Change			2010-2020	2020-2030	2030-2040
	Population growth		1,088	1,260	832
	% growth		5.4%	5.9%	3.7%
	Natural Increase		887	1,054	600
	Net Migration		201	205	232

METHODS AND DATA

Consistent boundaries for the geographic parts of the study area (such as those for the service districts and cities), that were in effect as of July 2011, were used to compile population, birth, housing, and land use data. Historical and recent demographic statistics and rates were calculated for these areas so that any annexations or boundary changes that occurred during the time span covered in this study would not skew demographic trends.

Developing long-term population forecasts for the study areas requires these main stages: 1) compiling and evaluating historical and recent data to ascertain demographic characteristics and trends in the study area and to obtain a population base from which the forecasts may be launched; 2) making assumptions about the future and adjusting the data or rates in the forecasting models (calibrating the models) to incorporate predicted rates or trends; and 3) evaluating the forecast results for reasonableness, comparing them to forecasts developed from different methods and to forecasts developed for other related areas, such as Clackamas County.

We first develop population projections, then we make adjustments to the projections to produce the forecasts. Population projections are developed by extending historical and current demographic and housing trends into the future. Forecasting population requires that assumptions be made about the future and adjusting the projection models to account for circumstances that perhaps skewed past trends or that with almost certainty will affect future change. Such circumstances in the past could be a building moratorium or the opening of a new group quarters facility. Events affecting future change would be, for example, planned future housing development that is higher than usual, a foreseen change in an area's physical ability to accommodate growth (buildable land available is approaching capacity or improvements to infrastructure that are underway), anticipated changes in the economy (the location of a new employer, the closing of an industry, or the upswing or downturn of the economy in general), or an expected change in the local population and household composition (age, ethnicity, average household size).

The primary demographic model utilized to develop the population forecasts for our study areas was a cohort-component model. A secondary model based on the Housing Unit Method, was

utilized to produce results for comparison. The cohort-component model best predicts population over the long-term for areas with larger populations. The housing unit model usually is better suited for smaller populations and incorporates recent annual data that account for more variability in population growth over the forecasting period. The forecasting models are described in more detail below.

Equivalent types of datasets were compiled for all of the geographic parts in the study area. The main data sources are the 2000 and 2010 decennial Censuses from the U.S. Census Bureau, Oregon Center for Health Statistics for birth and death data, and Metro's Regional Land Use Information System data on tax lots and land use.

Cohort-Component Model

A demographic projection model called the cohort-component model was used to forecast the population residing in each of the four study areas. Separate cohort-component models were developed for TCSD, CCSD#1, CCSD#1 All Damascus, and Milwaukie. These forecasts are 2010-based projections, which means that the starting point of the forecast horizon is 2010.

The cohort-component model predicts future populations as outcomes of the life events that occur over time. These events are comprised of **births, deaths**, and **migrations**. Thus, an area's population grows when births outnumber deaths and when more people move into the area than leave it. These events occur more often in certain age groups, or **cohorts**, than in others. For example, people tend to move around the most when they are in their 20s, or the elderly have lower chances than people in their 40s to survive over the next five years. Applying appropriate age- and gender-specific rates of birth, death and migration to the existing population cohorts of a particular area produce its future population.

The cohort-component method of forecasting population depends on the availability of accurate data on the age and gender composition of an area's population. The most precise information about population age structure in an area is usually provided by the most recent U.S. Census of Population. Rates of life events are applied to the known population cohorts and are usually derived from data such as those provided by the U.S. Census and the Oregon Center for Health

Statistics. These rates are then modified to account for the most recent trends as well as for future ones. Examples of such trends that may affect the future population of an area include the recent tendency among women of childbearing ages to delay having their first child, or a predisposition of young men (ages 20 to 29) to be more mobile than women in the same age cohort. A set of assumptions must be developed to address likely changes in the initial rates of life events and are based on judgment about how the trends might evolve in the study area. The existing population structure mostly determines the future population composition of the area, but it may change slightly depending on age-specific migration rates predicted for the future. Trends detected in historical and recent data, such as housing, socio-economic, land use, school enrollment, labor force, employment, and Medicare data help to determine these future migration rates.

The population, housing, and socio-economic data came from the Census Bureau's 2000 and 2010 Censuses of Population and Housing, and the American Community Survey (ACS) for 2005-2009; additional housing information were obtained from PRC's Population Estimates Program data for 2001-2010 and Metro's Regional Land Use Information data set; and the Oregon Center for Health Statistics provided information on fertility and mortality. Of the supporting data, datasets for Clackamas County were obtained from the Oregon Department of Education (school enrollments); the Oregon Employment Department (labor force and employment data); Center for Medicare Services (aged enrollees).

The Census and ACS data were available at the Census block or block-group level of geography. The Census blocks and block-groups were allocated into jurisdictional boundaries defined for 2010 using Geographic Information Systems (GIS). The 2000 population data were then organized into five-year age cohorts, such as 0 to 4 years, 5 to 9 years, and so on. Each of these cohorts was then "survived", or aged into the next cohort to the year 2010. "Surviving" the cohorts is accomplished by applying age- and sex-specific survival rates. These rates represent the proportion of population in each younger cohort that would survive during a given time period (such as the five years between 2000 and 2005) to become the next older cohort. This process is repeated for each five-year age group and five-year time interval between 2010 and 2040. Forecasting a known population (the 2010 population) and its age distribution enables

appropriate adjustments to be made to the model so that the forecasted population becomes aligned with the actual population and ensures the accuracy of the model's projections.

During each five-year interval, a certain number of live births occur to the women in childbearing ages. To calculate the future number of newly born residents in each study area, age-specific fertility rates were applied to the numbers of women in childbearing cohorts (under age 20, 20 to 24, and so on up to 45-49 years). Fertility rates indicate how many children women in a given age group are likely to give birth to during each five-year period (more discussion about birth data used to calculate fertility rates will follow). Once born, children become subject to survival rates and are "moved", or "aged", through the system like all the other cohorts.

The most difficult part is to estimate the in- and out-migration of an area. Since little reliable data are available to study in- and out-migration, it's best to use net migration rates, which is the balance between in- and out-migration. Net migration can be calculated if the population is known at the beginning and the end of a previous time period, as well as the number of births and deaths that occurred during the same time. Net migration is positive when more people move into the area than leave it; it is negative if the opposite is true. Net migration rates used in the cohort-component model can be interpreted as the number of people who are added to (or subtracted from) a given cohort due to migration over a given period of time (in this case, five years) per person in the resident population. The initial net migration rates for the cohort-component model were derived from the 2000 and 2010 population cohorts for the census blocks that are located to the study areas, as well as from births and deaths that occurred in the same areas during 2000-2010. The rates were adjusted so that the "forecasted" population for the year 2010 from the Census 2000 fit the actual population obtained from the 2010 Census. The net migration rates used to forecast the population in each study area from 2010 to 2040 were further modified to reflect the most likely future migration patterns. Demographic trends identified in post-2000 data from PRC's annual population estimates and the U.S. Census Bureau's ACS data had some bearing on the adjustments made to the model in the initial, 2000-2010, forecast period. In addition, migration patterns are greatly influenced by the local economy and by housing growth in the area, both current and assumed. When making the final adjustments to the net migration rates, consideration also was given to plan for future development in the region.

The development of the forecasts of population residing in each of the four study areas (TCSD, CCSD#1, CCSD#1 All Damascus, and Milwaukie) utilized the same forecasting methodology described in the section above. A unique set of demographic data were used for each of the study areas, and trends specific to each of them were considered when making adjustments to their cohort-component models.

Housing Unit Method and Model

We created models for the Housing Unit Method to forecast housing units and population for each of the four study areas. The results from these models serve as a check for reasonableness of the results from the cohort-component model. This method requires that a current housing inventory for each area be compiled and that past and recent rates of change in each inventory be known. Other housing and population data are needed as the components of the housing unit model besides housing units are occupancy rates, the average number of persons per household (PPH), and group quarters population. In this method, the number of housing units in an area is first projected or forecast, and then assumptions about housing occupancy and average household size are made to forecast household population. Persons residing in group quarters, (such as in college dormitories, prisons, and nursing homes) are also projected and then added to the household population to obtain the total population forecast. An area's total population is calculated in the housing unit method by multiplying the number of housing units forecasted by the occupancy rate and PPH and then adding to that product, the group quarters population. This process is carried out for five-year intervals throughout the forecast period.

Data used in the housing unit models are from the 2000 and 2010 Census of Population and Housing, and from recent and historical taxlot data that were obtained from the Census Bureau and Metro's RLIS. Other housing data and group quarters population data were collected directly from the cities in the study areas by PRC's Population Estimates Program (we send a housing and population questionnaire to Oregon's cities and counties and request that they complete and return the form to us each year). In a couple of cases, data were not available from cities. In this situation, adjustments were made to account for recent changes estimated to have occurred in the city's housing unit inventory detected from the land use data obtained from the RLIS data.

Population and housing data from 2000 and 2010 Censuses were compiled for each geographic part in the study area. An allocation of data was made to the 2010 study area boundaries using the same GIS methods as described previously in the cohort-component model section. Housing inventories were created from the 2000 and 2010 census data. Housing growth trends were detected from the Census data, the tax lot data, and PRC's housing data.

The number of housing units is projected based on past housing growth trends. Housing growth rates were calculated using the housing inventories and the amount of annual or periodic change they experienced. The housing trends were extrapolated into the future and applied to the 2010 housing inventory to predict the numbers of housing units in the future. Adjustments were made to the models to accelerate or curb growth based on current conditions compared to the past, or plans for future change. For example, in the case of the city of Milwaukie, the unavailability of much buildable land puts a restraint on future growth. Adjustments were made to the housing unit model by calculating weighted averages from annual or periodic growth rates, giving more bearing to the years believed to have more influence on what likely will occur in the future. For all study areas, because more housing units were constructed in the beginning of the 2000s than at the end, these weighted averages are more realistic than assuming annual averages for the decade for future housing growth.

The 2000 and 2010 Census data are also used to calculate average household sizes (PPH) and housing occupancy rates. Occupancy rates for the study areas were predicted for 2010-2040 based on the most recent Census data (2010), and adjusted according to past occupancy trends detected from the 2000 Census data and 2005-06 ACS data. Future PPHs were estimated based on past trends in the 2000, 2005-09, and 2010 data. The PPHs during the forecast period were assumed using the rationale that the increase of the Hispanic and older-age populations would balance out any changes in PPH (the PPH for Hispanics is higher than the average, and the PPH for persons ages 65 years and older is lower).

The number of persons residing in **group quarters** is a component of population that is added to the number of persons residing in households to arrive at the total population.

After the population residing in housing units was forecasted for each study area, the group quarters population was projected for the same areas. The group quarters population for in the study areas was projected based on the 2000 to 2010 changes. Typically the share of the total population that reside in group quarters does not change that much unless a new facility is constructed. The 2000-2010 change was tempered a bit to account for this stability factor. The projected group quarters populations were then added to the forecasted housing unit populations to obtain total population forecasts.

Births

The number of births that occurred during 2000 to 2010 were assigned to current study area boundaries using a combination of individual birth records obtained through a confidential data sharing agreement with the Oregon Center for Health Statistics. The number of annual births by mother's age for each study area was extracted from this dataset. Age-specific fertility rates were calculated by combining the birth data with the Census population data for females in the childbearing ages (ages 15-44). The number of births predicted to occur in the forecast periods during 2010 to 2040 were forecast as part of the cohort-component model by applying the fertility rates to the forecast female population by age group.

Growth Scenarios

As with any forecast, there is uncertainty associated with future growth trends. To reflect this uncertainty, three scenarios were prepared; medium - or most likely - growth, high growth, and low growth. The scenarios are primarily based on how much change is likely to occur to the components of population growth. The components – births (fertility), deaths (mortality), and migration – of a cohort component model predicts future populations based on historical, current, and expected future changes to the components. The medium growth scenario mostly adopts existing growth trends, while high and low growth reflects potential deviations from the medium scenario.

Supporting Data and Projections Produced From Other Sources

In addition to evaluating demographic trends detected from the data we used in our forecasting models, we reviewed other data and information to obtain a better understanding of the dynamics of population change specific to our study areas. This supporting information helps us to make better, or more realistic, assumptions about future population growth and to use better judgment when making adjustments to our demographic models. Some of the supporting data and information were available either at the city or county level of geography. Still the information is valuable for forecasting the study area. The sources for these data include demographic and socioeconomic data from the 2005-09 ACS, area Comprehensive Plans, and conversations with local planners. In addition, unpublished Clackamas County projections for 2000 to 2040 from the Oregon Office of Economic Analysis (OEA) were used to gauge our forecast results in the study areas and for comparison purposes. Employment projections for 2008-2018 from Oregon's Employment Department for Clackamas were also evaluated and were compared to our 2015-2020 forecast for the 18-64 populations.

General Comments about Population Forecasts

The longer the time-span of the forecast, the more likely it is that conditions change, and thus will increase the uncertainty in rates and assumptions. It is crucial to have recent data that allow testing, or calibrating, the assumptions used in the forecasting models. The study area's historical population helps to calibrate and adjust original migration rates and growth rates in the forecast models so that a better fit between actual and predicted number of persons can be achieved. In the long-run, however, the local economy and conditions affecting populations are likely to change in ways not currently anticipated.

All population forecasts are based on a combination of a beginning population; various known, estimated, and predicted rates of growth; and the forecasters' judgment about future trends. The forecasts may err through imprecise data or unexpected shifts in demographic trends. Generally, forecasts for larger geographical areas, such as the entire county or state, are more reliable than those for small areas, such as for a small city with fewer than 1,000 persons. These forecasts may be used as a guide to population growth over the next few years. However, changes in local areas will surely affect populations in some cities and actual populations in the study areas will

deviate from those shown here. The differences between the forecast and actual populations will vary in magnitude and perhaps direction.

The historical, recent, and predicted demographic rates and other statistics affecting population change in our study area are summarized and shown in Appendix 4. Also included in these summary tables are the population forecasts so that they may be viewed alongside their supporting information.

In the forecast tables accompanying this report, the original calculations for the population forecasts use decimal fractions. Because the fractions are rounded to show whole numbers, the numbers may not add exactly to the totals**.**

APPENDIX 1
Detailed Population Forecasts

Detailed Population Forecasts and rates of change for the Tri-City Service District (TCSD), Clackamas County Service District No. 1 (CCSD#1), Clackamas County Service District No. 1 with All Damascus (CCSD#1D), and the City of Milwaukie.

Population Forecasts for Study Areas by Growth Scenario

MEDIUM Growth Scenario, Populations for Tri-City SD, CCSD#1, CCSD#1 All Damascus, and Milwaukie												
AREA	**Known ----->**		**Forecast ----------→**									
	2000*	**2010**	**2011**	**2012**	**2013**	**2014**	**2015**	**2020**	**2025**	**2030**	**2035**	**2040**
Tri-City SD	62,096	70,544	71,347	71,900	72,457	73,019	73,585	76,340	79,451	82,315	84,740	86,748
CCSD #1	56,943	68,140	69,220	69,969	70,725	71,490	72,263	76,912	81,408	85,689	89,469	92,818
CCSD#1 All Damascus	64,536	76,865	78,091	78,948	79,815	80,691	81,577	86,876	92,016	97,157	101,888	106,193
Milwaukie	20,535	20,291	20,360	20,424	20,488	20,553	20,617	21,060	21,541	21,946	22,202	22,352

*Population for 2000 is allocated to 2010 boundaries.

LOW Growth Scenario, Populations for Tri-City SD, CCSD#1, CCSD#1 All Damascus, and Milwaukie												
AREA	**Known ----->**		**Forecast ----------→**									
	2000*	**2010**	**2011**	**2012**	**2013**	**2014**	**2015**	**2020**	**2025**	**2030**	**2035**	**2040**
Tri-City SD	62,096	70,544	71,235	71,673	72,115	72,560	72,418	75,084	77,460	79,553	81,222	82,408
CCSD #1	56,943	68,140	69,108	69,742	70,382	71,027	71,679	75,662	79,417	82,888	85,794	88,176
CCSD#1 All Damascus	64,536	76,865	77,967	78,699	79,437	80,182	80,900	85,438	89,706	93,857	97,526	100,718
Milwaukie	20,535	20,291	20,329	20,361	20,393	20,426	20,458	20,730	21,026	21,242	21,305	21,235

*Population for 2000 is allocated to 2010 boundaries.

HIGH Growth Scenario, Populations for Tri-City SD, CCSD#1, CCSD#1 All Damascus, and Milwaukie												
AREA	**Known ----->**		**Forecast ----------→**									
	2000*	**2010**	**2011**	**2012**	**2013**	**2014**	**2015**	**2020**	**2025**	**2030**	**2035**	**2040**
Tri-City SD	62,096	70,544	71,455	72,117	72,786	73,461	74,142	78,148	81,987	85,623	88,814	91,674
CCSD #1	56,943	68,140	69,327	70,185	71,054	71,933	72,824	78,120	83,348	88,436	93,105	97,456
CCSD#1 All Damascus	64,536	76,865	78,208	79,186	80,176	81,178	82,163	88,168	94,114	100,136	105,853	111,323
Milwaukie	20,535	20,291	20,390	20,485	20,579	20,674	20,770	2,1379	22,044	22,638	23,090	23,471

*Population for 2000 is allocated to 2010 boundaries.

Forecasts for Individual Study Areas and Average Annual Change

Tri-City Service District (TCSD)

Tri-City SD	Known ---->		Forecast ---------->									
	2000*	2010	2011	2012	2013	2014	2015	2020	2025	2030	2035	2040
Medium	62,096	70,544	71,347	71,900	72,457	73,019	73,585	76,340	79,451	82,315	84,740	86,748
Low	62,096	70,544	71,235	71,673	72,115	72,560	72,418	75,084	77,460	79,553	81,222	82,408
High	62,096	70,544	71,455	72,117	72,786	73,461	74,142	78,148	81,987	85,623	88,814	91,674

*Population for 2000 is allocated to 2010 boundaries.

Avg. Annual Change in #	Known	Forecast ---------->					
Tri-City SD	2000-10	2010-15	2015-20	2020-25	2025-30	2035-40	2010-40
Medium	845	579	551	622	573	485	402
Low	845	357	533	475	419	334	237
High	845	685	801	768	727	638	572

*Population for 2000 is allocated to 2010 boundaries.

Avg. Annual Growth Rate	Known	Forecast ---------->					
Tri-City SD	2000-10	2010-15	2015-20	2020-25	2025-30	2035-40	2010-40
Medium	1.28%	0.80%	0.74%	0.80%	0.71%	0.58%	0.47%
Low	1.28%	0.50%	0.72%	0.62%	0.53%	0.42%	0.29%
High	1.28%	0.95%	1.05%	0.96%	0.87%	0.73%	0.63%

*Population for 2000 is allocated to 2010 boundaries.

CCSD#1

CCSD#1	Known ------>		Forecast ---------->									
	2000*	2010	2011	2012	2013	2014	2015	2020	2025	2030	2035	2040
Medium	56,943	68,140	69,220	69,969	70,725	71,490	72,263	76,912	81,408	85,689	89,469	92,818
Low	56,943	68,140	69,108	69,742	70,382	71,027	71,679	75,662	79,417	82,888	85,794	88,176
High	56,943	68,140	69,327	70,185	71,054	71,933	72,824	78,120	83,348	88,436	93,105	97,456

*Population for 2000 is allocated to 2010 boundaries.

Avg. Annual Change in #	Known	Forecast ---------->					
CCSD#1	2000-10	2010-15	2015-20	2020-25	2025-30	2035-40	2010-40
Med	1,120	785	930	899	856	756	670
Low	1,120	674	797	751	694	581	476
High	1,120	892	1,059	1,046	1,018	934	870

Avg. Annual Growth Rate	Known	Forecast ---------->					
CCSD#1	2000-10	2010-15	2015-20	2020-25	2025-30	2035-40	2010-40
Med	1.80%	1.12%	1.25%	1.14%	1.02%	0.86%	0.73%
Low	1.80%	0.96%	1.08%	0.97%	0.86%	0.69%	0.55%
High	1.80%	1.27%	1.40%	1.30%	1.19%	1.03%	0.91%

CCSD#1 All Damascus

CCSD#1 All Damascus	Known ------>		Forecast ---------->									
	2000*	2010	2011	2012	2013	2014	2015	2020	2025	2030	2035	2040
Medium	64,536	76,865	78,091	78,948	79,815	80,691	81,577	86,876	92,016	97,157	101,888	106,193
Low	64,536	76,865	77,967	78,699	79,437	80,182	80,900	85,438	89,706	93,857	97,526	100,718
High	64,536	76,865	78,208	79,186	80,176	81,178	82,163	88,168	94,114	100,136	105,853	111,323

Avg. Annual Change in #	Known	Forecast ---------->					
CCSD#1 All Damascus	2000-10	2010-15	2015-20	2020-25	2025-30	2035-40	2010-40
Medium	1,233	897	1,060	1,028	1,028	946	861
Low	1,233	769	908	854	830	734	638
High	1,233	1,009	1,201	1,189	1,204	1,143	1,094

Avg. Annual Growth Rate	Known	Forecast ---------->					
CCSD#1 All Damascus	2000-10	2010-15	2015-20	2020-25	2025-30	2035-40	2010-40
Medium	1.75%	1.13%	1.26%	1.15%	1.09%	0.95%	0.83%
Low	1.75%	0.97%	1.09%	0.97%	0.90%	0.77%	0.64%
High	1.75%	1.27%	1.41%	1.31%	1.24%	1.11%	1.01%

City of Milwaukie

Milwaukie	Known ------->		Forecast ---------->									
	2000*	2010	2011	2012	2013	2014	2015	2020	2025	2030	2035	2040
Medium	20,535	20,291	20,360	20,424	20,488	20,553	20,617	21,060	21,541	21,946	22,202	22,352
Low	20,535	20,291	20,329	20,361	20,393	20,426	20,458	20,730	21,026	21,242	21,305	21,235
High	20,535	20,291	20,390	20,485	20,579	20,674	20,770	21,379	22,044	22,638	23,090	23,471

Avg. Annual Change in #	Known	Forecast ---------->					
Milwaukie	**2000-10**	**2010-15**	**2015-20**	**2020-25**	**2025-30**	**2035-40**	**2010-40**
Medium	-24	62	88	96	81	51	30
Low	-24	32	54	59	43	13	-14
High	-24	91	122	133	119	90	76

Avg. Annual Growth Rate	Known	Forecast ---------->					
Milwaukie	**2000-10**	**2010-15**	**2015-20**	**2020-25**	**2025-30**	**2035-40**	**2010-40**
Medium	-0.12%	0.30%	0.42%	0.45%	0.37%	0.23%	0.13%
Low	-0.12%	0.16%	0.26%	0.28%	0.20%	0.06%	-0.07%
High	-0.12%	0.44%	0.58%	0.61%	0.53%	0.40%	0.33%

APPENDIX 2

Population Forecasts for Individual Study Areas by Broad Age Groups in Medium Growth Scenario

Broad Age Groups	**Medium Scenario**						
TCSD	**2010**	**2015**	**2020**	**2025**	**2030**	**2035**	**2040**
Ages 0-17	17,456	16,686	15,977	15,866	16,168	16,252	15,929
Ages 18-64	44,460	45,915	47,695	48,726	49,410	50,705	52,261
Ages 65 and over	8,294	10,395	12,669	14,859	16,737	17,784	18,558
Total	70,209	72,996	76,340	79,451	82,315	84,740	86,748
CCSD#1	**2010**	**2015**	**2020**	**2025**	**2030**	**2035**	**2040**
Ages 0-17	16,531	16,040	16,092	16,555	17,245	17,786	17,901
Ages 18-64	43,596	45,782	47,816	49,211	50,536	52,018	53,745
Ages 65 and older	8,353	10,442	13,005	15,642	17,908	19,666	21,172
Total	68,480	72,263	76,912	81,408	85,689	89,469	92,818
CCSD#1 All Damascus	**2010**	**2015**	**2020**	**2025**	**2030**	**2035**	**2040**
Ages 0-17	18,506	18,030	18,162	18,763	19,701	20,532	20,887
Ages 18-64	49,060	51,383	53,650	55,256	57,080	59,276	61,879
Ages 65 and older	9,677	12,164	15,064	17,997	20,376	22,080	23,427
Total	77,242	81,577	86,876	92,016	97,157	101,888	106,193
Milwaukie	**2010**	**2015**	**2020**	**2025**	**2030**	**2035**	**2040**
Ages 0-17	4,147	3,856	3,672	3,741	3,885	3,955	3,833
Ages 18-64	13,383	13,608	13,775	13,768	13,734	13,804	14,039
Ages 65 and older	2,767	3,154	3,613	4,032	4,328	4,443	4,479
Total	20,296	20,617	21,060	21,541	21,946	22,202	22,352

APPENDIX 3

Assumed Demographic Rates for Three Growth Scenarios

Table 3A. Total Fertility Rates in Three Growth Scenarios

	Tri-City SD			CCSD#1			CCSD#1-All Damascus			Milwaukie		
Year	**High**	**Med**	**Low**	**High**	**Med**	**Low**	**High**	**Med**	**Low**	**High**	**Med**	**Low**
2000-2010*	1.95	1.95	1.95	1.92	1.92	1.92	1.90	1.90	1.90	1.78	1.78	1.78
2010-2015	1.97	1.88	1.78	1.91	1.82	1.73	1.89	1.80	1.71	1.74	1.66	1.58
2015-2020	2.00	1.91	1.81	1.94	1.85	1.76	1.92	1.83	1.74	1.77	1.69	1.60
2020-2025	2.03	1.93	1.84	1.97	1.87	1.78	1.96	1.87	1.77	1.80	1.71	1.62
2025-2030	2.05	1.95	1.85	1.98	1.89	1.80	1.99	1.89	1.80	1.81	1.72	1.64
2030-2035	2.05	1.95	1.86	1.99	1.89	1.80	2.00	1.91	1.81	1.81	1.73	1.64
2035-2040	2.05	1.96	1.86	1.99	1.90	1.80	2.00	1.90	1.81	1.82	1.73	1.64

*The average for 2000 and 2010 from actual know data.

Table 3B. Survival Rates for TCSD

	2010-2015		2015-2020		2020-2025		2025-2030		2030-2035		2035-2040	
	M	F	M	F	M	F	M	F	M	F	M	F
Age	L(x)	L(x)	L(x)	L(x)	L(x)	L(x)	L(x)	L(x)	L(x)	L(x)	L(x)	L(x)
0-4	0.9941	0.9947	0.9944	0.9949	0.9947	0.9951	0.9950	0.9953	0.9952	0.9955	0.9954	0.9957
5-9	0.9987	0.9991	0.9988	0.9991	0.9989	0.9991	0.9989	0.9992	0.9990	0.9992	0.9990	0.9993
10-14	0.9990	0.9994	0.9990	0.9994	0.9991	0.9995	0.9991	0.9995	0.9992	0.9995	0.9992	0.9995
15-19	0.9984	0.9989	0.9984	0.9990	0.9985	0.9990	0.9986	0.9991	0.9987	0.9991	0.9987	0.9992
20-24	0.9953	0.9981	0.9956	0.9981	0.9958	0.9982	0.9960	0.9983	0.9962	0.9984	0.9964	0.9984
25-29	0.9941	0.9976	0.9944	0.9977	0.9946	0.9978	0.9949	0.9979	0.9951	0.9980	0.9954	0.9981
30-34	0.9934	0.9977	0.9937	0.9978	0.9940	0.9979	0.9943	0.9980	0.9946	0.9981	0.9948	0.9982
35-39	0.9929	0.9963	0.9933	0.9965	0.9936	0.9966	0.9939	0.9968	0.9942	0.9969	0.9945	0.9970
40-44	0.9888	0.9936	0.9894	0.9939	0.9899	0.9942	0.9904	0.9944	0.9908	0.9947	0.9913	0.9949
45-49	0.9830	0.9896	0.9839	0.9901	0.9847	0.9906	0.9854	0.9910	0.9861	0.9914	0.9867	0.9917
50-54	0.9740	0.9842	0.9753	0.9850	0.9765	0.9856	0.9776	0.9863	0.9787	0.9868	0.9796	0.9874
55-59	0.9623	0.9777	0.9642	0.9787	0.9659	0.9797	0.9675	0.9806	0.9690	0.9814	0.9704	0.9821
60-64	0.9473	0.9668	0.9499	0.9684	0.9523	0.9698	0.9545	0.9711	0.9566	0.9723	0.9586	0.9734
65-69	0.9247	0.9489	0.9284	0.9512	0.9318	0.9533	0.9349	0.9553	0.9379	0.9572	0.9406	0.9589
70-74	0.8875	0.9199	0.8929	0.9234	0.8978	0.9267	0.9025	0.9298	0.9068	0.9326	0.9108	0.9353
75-79	0.8281	0.8758	0.8359	0.8812	0.8433	0.8862	0.8502	0.8908	0.8567	0.8951	0.8627	0.8991
80-84	0.7327	0.7945	0.7442	0.8030	0.7550	0.8108	0.7651	0.8182	0.7746	0.8250	0.7835	0.8314
85+	0.4924	0.5451	0.5088	0.5589	0.5245	0.5721	0.5396	0.5847	0.5541	0.5966	0.5680	0.6080

Table 3C. Survival Rates for CCSD#1

	2010-2015		2015-2020		2020-2025		2025-2030		2030-2035		2035-2040	
	M	F	M	F	M	F	M	F	M	F	M	F
Age	L(x)	L(x)	L(x)	L(x)	L(x)	L(x)	L(x)	L(x)	L(x)	L(x)	L(x)	L(x)
0-4	0.9944	0.9949	0.9947	0.9951	0.9949	0.9953	0.9952	0.9955	0.9954	0.9957	0.9956	0.9959
5-9	0.9988	0.9991	0.9989	0.9991	0.9989	0.9992	0.9990	0.9992	0.9990	0.9993	0.9991	0.9993
10-14	0.9990	0.9994	0.9991	0.9995	0.9991	0.9995	0.9992	0.9995	0.9992	0.9995	0.9992	0.9996
15-19	0.9984	0.9990	0.9985	0.9990	0.9986	0.9991	0.9987	0.9991	0.9987	0.9992	0.9988	0.9992
20-24	0.9956	0.9981	0.9958	0.9982	0.9960	0.9983	0.9962	0.9984	0.9964	0.9985	0.9965	0.9985
25-29	0.9943	0.9977	0.9946	0.9978	0.9949	0.9979	0.9951	0.9980	0.9954	0.9981	0.9956	0.9982
30-34	0.9937	0.9978	0.9940	0.9979	0.9943	0.9980	0.9946	0.9981	0.9948	0.9982	0.9951	0.9982
35-39	0.9933	0.9965	0.9936	0.9966	0.9939	0.9968	0.9942	0.9969	0.9945	0.9971	0.9947	0.9972
40-44	0.9893	0.9939	0.9899	0.9942	0.9904	0.9945	0.9908	0.9947	0.9912	0.9949	0.9916	0.9951
45-49	0.9838	0.9901	0.9846	0.9906	0.9853	0.9910	0.9860	0.9914	0.9867	0.9917	0.9873	0.9921
50-54	0.9752	0.9849	0.9764	0.9856	0.9776	0.9863	0.9786	0.9869	0.9796	0.9874	0.9805	0.9879
55-59	0.9639	0.9787	0.9657	0.9797	0.9674	0.9806	0.9689	0.9814	0.9704	0.9822	0.9717	0.9829
60-64	0.9496	0.9683	0.9521	0.9697	0.9544	0.9711	0.9565	0.9723	0.9585	0.9735	0.9604	0.9745
65-69	0.9279	0.9511	0.9314	0.9533	0.9347	0.9554	0.9377	0.9573	0.9406	0.9590	0.9432	0.9606
70-74	0.8922	0.9233	0.8973	0.9267	0.9021	0.9299	0.9066	0.9328	0.9107	0.9355	0.9146	0.9380
75-79	0.8350	0.8809	0.8426	0.8861	0.8497	0.8909	0.8563	0.8953	0.8625	0.8995	0.8683	0.9034
80-84	0.7428	0.8026	0.7539	0.8107	0.7643	0.8183	0.7741	0.8254	0.7833	0.8320	0.7920	0.8382
85+	0.5068	0.5583	0.5229	0.5720	0.5385	0.5850	0.5533	0.5973	0.5676	0.6091	0.5812	0.6202

Table 3D. Survival Rates for CCSD#1D All Damascus

	2010-2015		2015-2020		2020-2025		2025-2030		2030-2035		2035-2040	
	M	F	M	F	M	F	M	F	M	F	M	F
Age	L(x)	L(x)	L(x)	L(x)	L(x)	L(x)	L(x)	L(x)	L(x)	L(x)	L(x)	L(x)
0-4	0.9945	0.9950	0.9947	0.9952	0.9949	0.9954	0.9952	0.9956	0.9953	0.9958	0.9955	0.9960
5-9	0.9988	0.9991	0.9989	0.9992	0.9989	0.9992	0.9990	0.9992	0.9990	0.9993	0.9990	0.9993
10-14	0.9990	0.9995	0.9991	0.9995	0.9991	0.9995	0.9992	0.9995	0.9992	0.9995	0.9992	0.9996
15-19	0.9985	0.9990	0.9985	0.9991	0.9986	0.9991	0.9986	0.9991	0.9987	0.9992	0.9987	0.9992
20-24	0.9956	0.9982	0.9958	0.9983	0.9960	0.9983	0.9962	0.9984	0.9963	0.9985	0.9964	0.9985
25-29	0.9944	0.9978	0.9947	0.9979	0.9949	0.9980	0.9951	0.9980	0.9953	0.9981	0.9955	0.9982
30-34	0.9938	0.9978	0.9941	0.9979	0.9943	0.9980	0.9946	0.9981	0.9948	0.9982	0.9950	0.9983
35-39	0.9934	0.9965	0.9936	0.9967	0.9939	0.9968	0.9942	0.9970	0.9944	0.9971	0.9946	0.9972
40-44	0.9895	0.9940	0.9899	0.9943	0.9904	0.9946	0.9908	0.9948	0.9911	0.9950	0.9915	0.9952
45-49	0.9841	0.9903	0.9847	0.9907	0.9854	0.9912	0.9860	0.9915	0.9865	0.9919	0.9870	0.9922
50-54	0.9756	0.9852	0.9766	0.9859	0.9776	0.9865	0.9785	0.9871	0.9794	0.9877	0.9801	0.9882
55-59	0.9646	0.9791	0.9660	0.9801	0.9674	0.9810	0.9688	0.9818	0.9700	0.9825	0.9711	0.9832
60-64	0.9505	0.9689	0.9525	0.9703	0.9544	0.9716	0.9563	0.9729	0.9580	0.9740	0.9595	0.9750
65-69	0.9293	0.9520	0.9320	0.9542	0.9347	0.9562	0.9374	0.9581	0.9399	0.9598	0.9419	0.9614
70-74	0.8942	0.9247	0.8982	0.9281	0.9022	0.9312	0.9062	0.9341	0.9097	0.9367	0.9128	0.9392
75-79	0.8379	0.8831	0.8438	0.8882	0.8498	0.8929	0.8557	0.8973	0.8610	0.9014	0.8656	0.9051
80-84	0.7471	0.8060	0.7557	0.8140	0.7645	0.8215	0.7732	0.8285	0.7811	0.8350	0.7878	0.8411
85+	0.5129	0.5640	0.5256	0.5775	0.5388	0.5905	0.5520	0.6027	0.5641	0.6144	0.5747	0.6255

Table 3E. Survival Rates for Milwaukie

	2010-2015		2015-2020		2020-2025		2025-2030		2030-2035		2035-2040	
	M	F	M	F	M	F	M	F	M	F	M	F
Age	L(x)	L(x)	L(x)	L(x)	L(x)	L(x)	L(x)	L(x)	L(x)	L(x)	L(x)	L(x)
0-4	0.9947	0.9951	0.9949	0.9954	0.9952	0.9956	0.9954	0.9958	0.9956	0.9959	0.9958	0.9961
5-9	0.9989	0.9992	0.9989	0.9992	0.9990	0.9992	0.9990	0.9993	0.9991	0.9993	0.9991	0.9993
10-14	0.9991	0.9995	0.9991	0.9995	0.9992	0.9995	0.9992	0.9995	0.9992	0.9996	0.9993	0.9996
15-19	0.9985	0.9990	0.9986	0.9991	0.9987	0.9991	0.9987	0.9992	0.9988	0.9992	0.9988	0.9992
20-24	0.9958	0.9982	0.9960	0.9983	0.9962	0.9984	0.9964	0.9985	0.9965	0.9985	0.9967	0.9986
25-29	0.9946	0.9978	0.9949	0.9979	0.9951	0.9980	0.9954	0.9981	0.9956	0.9982	0.9958	0.9983
30-34	0.9940	0.9979	0.9943	0.9980	0.9946	0.9981	0.9949	0.9982	0.9951	0.9983	0.9953	0.9983
35-39	0.9936	0.9966	0.9939	0.9968	0.9942	0.9969	0.9945	0.9971	0.9947	0.9972	0.9950	0.9973
40-44	0.9898	0.9942	0.9903	0.9945	0.9908	0.9947	0.9913	0.9950	0.9917	0.9952	0.9921	0.9954
45-49	0.9846	0.9906	0.9853	0.9910	0.9861	0.9914	0.9867	0.9918	0.9873	0.9921	0.9879	0.9925
50-54	0.9764	0.9857	0.9775	0.9863	0.9786	0.9869	0.9797	0.9875	0.9806	0.9880	0.9815	0.9885
55-59	0.9657	0.9797	0.9674	0.9806	0.9690	0.9815	0.9704	0.9823	0.9718	0.9831	0.9731	0.9837
60-64	0.9520	0.9698	0.9544	0.9712	0.9566	0.9725	0.9586	0.9737	0.9605	0.9748	0.9623	0.9758
65-69	0.9313	0.9534	0.9347	0.9555	0.9378	0.9575	0.9407	0.9593	0.9434	0.9610	0.9459	0.9625
70-74	0.8972	0.9269	0.9021	0.9301	0.9067	0.9332	0.9109	0.9360	0.9149	0.9386	0.9186	0.9410
75-79	0.8423	0.8864	0.8496	0.8913	0.8564	0.8959	0.8628	0.9002	0.8687	0.9041	0.8743	0.9078
80-84	0.7535	0.8112	0.7642	0.8190	0.7743	0.8263	0.7837	0.8331	0.7926	0.8395	0.8009	0.8454
85+	0.5224	0.5727	0.5383	0.5861	0.5536	0.5989	0.5682	0.6110	0.5822	0.6225	0.5956	0.6334

Table 3F. Average Annual Number of Net Migrants in Three Growth Scenarios

	Tri-city SD			CCSD#1			CCSD#1-All Damascus			Milwaukie		
Year	**High**	**Med**	**Low**	**High**	**Med**	**Low**	**High**	**Med**	**Low**	**High**	**Med**	**Low**
2000-2010*	391	391	391	689	689	689	798	798	798	-90	-90	-90
2010-2015	420	352	279	553	486	414	673	594	517	20	3	-16
2015-2020	526	447	364	707	632	553	852	758	675	20	3	-15
2020-2025	487	403	318	698	615	529	851	737	652	21	3	-16
2025-2030	509	423	335	740	649	556	947	816	723	20	3	-15
2030-2035	519	439	359	775	675	575	1,010	860	765	21	2	-16
2035-2040	542	453	366	820	710	601	1,066	896	800	25	3	-20

*The value for 2000-2010 from actual known data; the rest are assumed for the forecast periods.

APPENDIX 4

Summary Demographic and Forecast Data

This table holds a summary of supporting data that were used to develop the population forecasts. They include recent historic data (including populations) as well as forecasted data. The data are grouped by study area. There is a table for TCSD, CCSD #1, CCSD #1 All Damascus, and the City of Milwaukie.

Population and housing data and rates for 2000 and 2010 are from decennial censuses; 2000-2010 birth data are from administrative records. All numbers for years 2015-2040 are predicted.

Abbreviated column headings key:
Pop = population; **#Avg. Ann Pop Growth** = the number of the average annual population growth; **%Avg. Ann Pop Growth** = the percent of the average annual population growth; **%Pop 65+** = the percentage of the population, ages 65 and over; **% Pop Hispanic** = the percentage of the population that is Hispanic; **HH** = households; **HU** = housing units; **Occ Rate** = occupancy rate; **PPH** = average persons per household; **GQ pop** = group quarters population.

Area	Pop	# Avg. Ann Pop Growth	% Avg. Ann Pop Growth	% Pop 65+	% Hispanic	HH	HU	# Avg. Ann HU Growth	% Avg. Ann HU Growth	Occ Rate	PPH	GQ Pop	Births
TCSD													
2000	62,096			9.4%	4.3%	22,846	24,233			94.3%	2.67	1,155	789
2010	70,544	845	1.3%	11.8%	6.3%	26,657	28,427	419	1.6%	93.8%	2.61	895	701
2015	72,996	467	0.7%	14.2%		28,204	30,103	319	1.1%	93.7%	2.55	1,049	
2020	76,340	669	0.9%	16.6%		29,952	31,993	378	1.2%	93.6%	2.51	1,075	
2025	79,451	622	0.8%	18.7%		31,641	33,823	183	1.1%	93.5%	2.47	1,146	
2030	82,315	573	0.7%	20.3%		33,330	35,656	349	1.1%	93.5%	2.44	1,100	
2035	84,740	485	0.6%	21.0%		34,887	37,350	339	0.9%	93.4%	2.40	1,060	
2040	86,748	402	0.5%	21.4%		36,265	38,884	307	0.8%	93.3%	2.36	1,146	
CCSD #1													
2000	56,943			10.0%	5.8%	21,738	23,041			94.3%	2.61	237	806
2010	68,140	1,120	1.8%	12.1%	10.0%	26,083	27,884	484	1.9%	93.5%	2.60	446	853
2015	72,263	785	1.0%	14.5%		27,722	29,677	359	1.2%	93.4%	2.59	506	
2020	76,912	930	1.2%	16.9%		29,570	31,694	403	1.3%	93.3%	2.58	565	
2025	81,408	899	1.1%	19.2%		31,368	33,663	394	1.2%	93.2%	2.58	625	
2030	85,689	856	1.0%	20.9%		33,092	35,556	379	1.1%	93.1%	2.57	685	
2035	89,469	756	0.9%	22.0%		34,629	37,253	339	0.9%	93.0%	2.56	745	
2040	92,818	670	0.7%	22.8%		35,982	38,803	310	0.8%	92.7%	2.56	864	
CCSD #1 w/ Damascus													
2000	64,536			9.9%	5.4%	24,347	25,703			94.7%	2.64	237	882
2010	76,866	1,233	1.8%	12.5%	9.3%	29,117	31,037	533	1.9%	93.8%	2.62	468	938
2015	81,577	897	1.1%	14.9%		31,004	33,097	412	1.3%	93.7%	2.61	534	
2020	86,876	1,060	1.3%	17.3%		33,126	35,407	462	1.4%	93.6%	2.60	600	
2025	92,016	1,028	1.2%	19.6%		35,202	37,674	453	1.2%	93.4%	2.60	666	
2030	97,157	1,028	1.1%	21.0%		37,293	39,964	458	1.2%	93.3%	2.59	732	
2035	101,888	946	1.0%	21.7%		39,240	42,104	428	1.0%	93.2%	2.58	798	
2040	106,193	861	0.8%	22.1%		41,010	44,117	402	0.9%	93.0%	2.57	930	
City of Milwaukie													
2000	20,535			13.7%	4.00%	8,581	9,009			95.2%	2.35	389	282
2010	20,291	(24)	-0.1%	13.6%	7.03%	8,667	9,138	13	0.1%	94.8%	2.30	340	227
2015	20,617	62	0.3%	15.3%		8,800	9,283	29	0.3%	94.8%	2.30	377	
2020	21,060	88	0.4%	17.2%		9,066	9,568	57	0.6%	94.7%	2.28	365	
2025	21,541	96	0.5%	18.7%		9,375	9,900	66	0.7%	94.7%	2.27	303	
2030	21,946	81	0.4%	19.7%		9,606	10,150	50	0.5%	94.6%	2.25	349	
2035	22,202	51	0.2%	20.0%		9,784	10,344	39	0.4%	94.6%	2.23	374	
2040	22,352	30	0.1%	20.0%		9,948	10,529	37	0.4%	94.5%	2.21	330	

APPENDIX 5

Information Obtained from Conversations with Planners

The information below was obtained from conversations with local planners in the study areas during November-December 2011. The conversations primarily focused on issues related to population forecasts and housing development trends in the planning jurisdictions as specified below. The comments are subjective, but served to enlighten the forecasters about the demographic dynamics with the study areas and about possible future plans.

Milwaukie
Ryan Marquardt, Planner

- Milwaukie is fairly constrained by geography for much housing growth to take place.
- However:
    - Current annexations have occurred/are occurring mostly in already developed Single Family areas, including:
        - On the east side of Milwaukie
        - Individual property in the NW corner of the city
    - The vacant area near Hwy 224 is developable with 100 HUs possible
- Housing:
    - No major group quarters are planned for construction in the next few years.
    - The last mixed-use development occurred in 2005 near downtown Milwaukie.
    - Most housing developers constructing single-family housing units.
    - The city sees redevelopment opportunities in the area.
- Development proposals:
    - No major development proposals on hand.
- Impact of Portland-Milwaukie Light Rail:
    - Construction to be completed in 2015.
    - Only one stop in Milwaukie before ending in the Park Avenue of Clackamas.

Damascus
Steve Gaschler, Director of Community Development

- Little development has been occurring in recent years.
- The city is refocusing on comprehensive plan development:
    - Earlier comprehensive plan was not passed by residents because the plan was too tentative and didn't answer many questions
    - A new comprehensive plan will take a couple of years to pass.
- Damascus can roughly be divided into four quadrants.
    - The NW and SW quadrants are definitely going to CCSD.
    - The NE region is close to Gresham and could go to the Gresham service district.

    - The SE quadrant could go either way.
- Future growth mostly likely to happen on the west side of the city.
- The city is working with developers on new development:
    - Development to be market driven.
    - More focus is on Single Family units.
    - Earlier focus on Multi-family Residential housing (MFR) was not popular among residents.

Gladstone and Clackamas County:
Clay Glasgow, Planner

- Gladstone is relatively built out.
- A current major water pipe replacement project in the city.
- Housing development-wise little happening
    - Hardly any new construction and subdivisions are planned for the near future.
    - Housing trends in Gladstone are similar to Clackamas County's trends.
    - Molalla seems to be an exception; they are building 65 multifamily units.
    - Damascus and Happy Valley are growing in a checkerboard manner by annexations, which make service provisions difficult.
    - Outside the urban areas, little to no developmental activities are happening.

Oregon City
Pete Walter, Planning Director

- Within the last five years, Oregon City has developed two development Concept Plans:
    - Park Place Plan – focusing mostly on residential housing on the east side of the city within the UGB; the Park Place Plan has already been adopted.
    - Beavercreek Plan – Focusing on residential/mixed use. Not passed yet.
- 3rd Concept Plan for the SE Oregon City to be out in 2012/2013:
    - Major plan for up to 210 acres
    - Residential/Neighborhood level and commercial zoning
    - Flexible higher density as allowed by Metro
- 100 lots of infill developments have housing construction activity.
- There is developable land and potential (within the existing UGB) for growth.
- Development depends upon success of annexation; however, very few annexations passed in the last few years.
- Local builders are sitting idle at the moment.
- Major development constraints:
    - Steep cliffs on SE side of the city
    - On the east side, natural areas, - more likely to be designated as a regional open space (400-600 acres)
    - More development to be seen in the Park Place area
- Recent developments:
    - Clackamas Community College (2008) planned to add 50-200K sq. ft. buildings

- Clackamas Housing Authority is permitted to go ahead with their 20 year plan; just recently expansion in Park Place area
- Closing of the Blue Heron Mill Plant (near the downtown)
    - Metro/OR City/ODOT looking at redeveloping the area
- With Willamette Falls close by, this area has development potential.

West Linn
John Sonnen, Building Permit Coordinator

- No major development is occurring or is anticipated to happen in the near future.
- Six lots are being built in the Street of Dreams; (large lots with big houses).
- Permits have gone out for 29 lots.
- Housing growth in West Linn is constrained by its topography.

APPENDIX 6

Maps of Population Density in the Study Areas (2010)

The following maps show the distribution of population density in and around the study areas. For each area, the first map provided shows the number of people per square miles which is based on Census 2010 blocks. Locations with the lightest densities have no color and are transparent.

Figure 6. Tri-City Service District (TCSD): Population per Square Mile

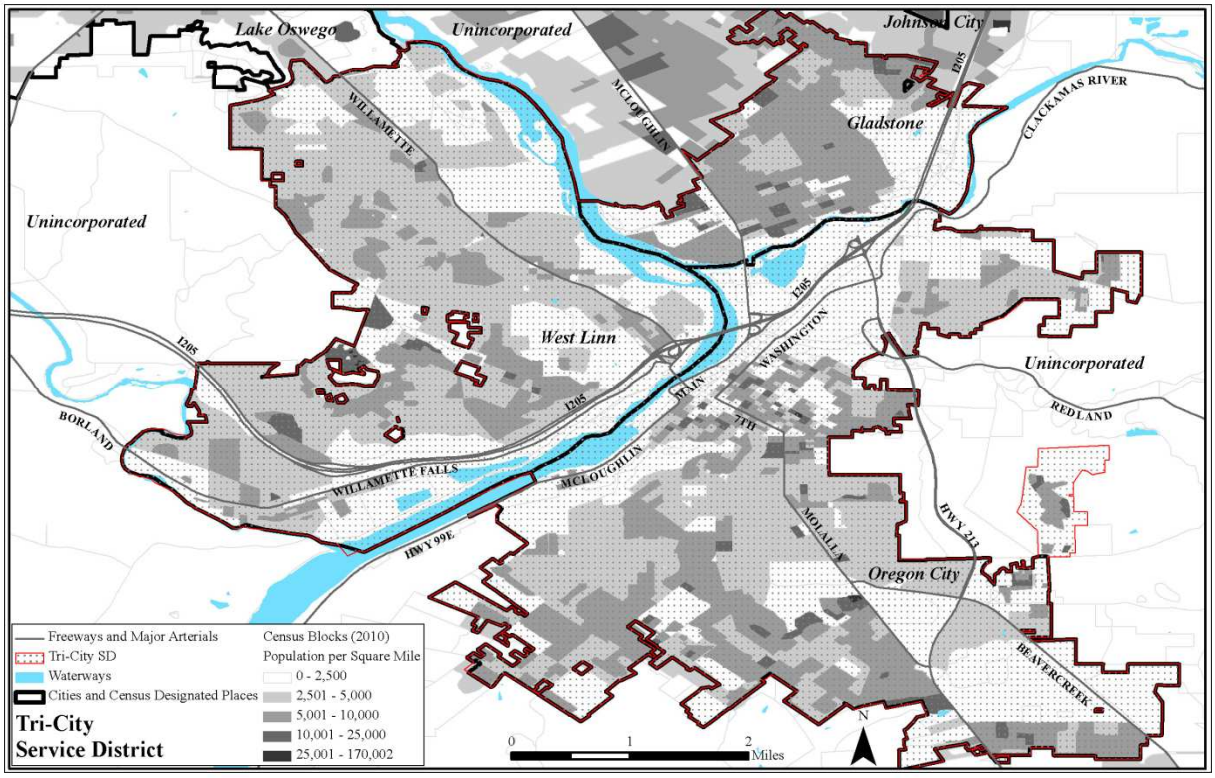


Figure 7. Clackamas County Service District No. 1 (CCSD#1): Population per Square Mile

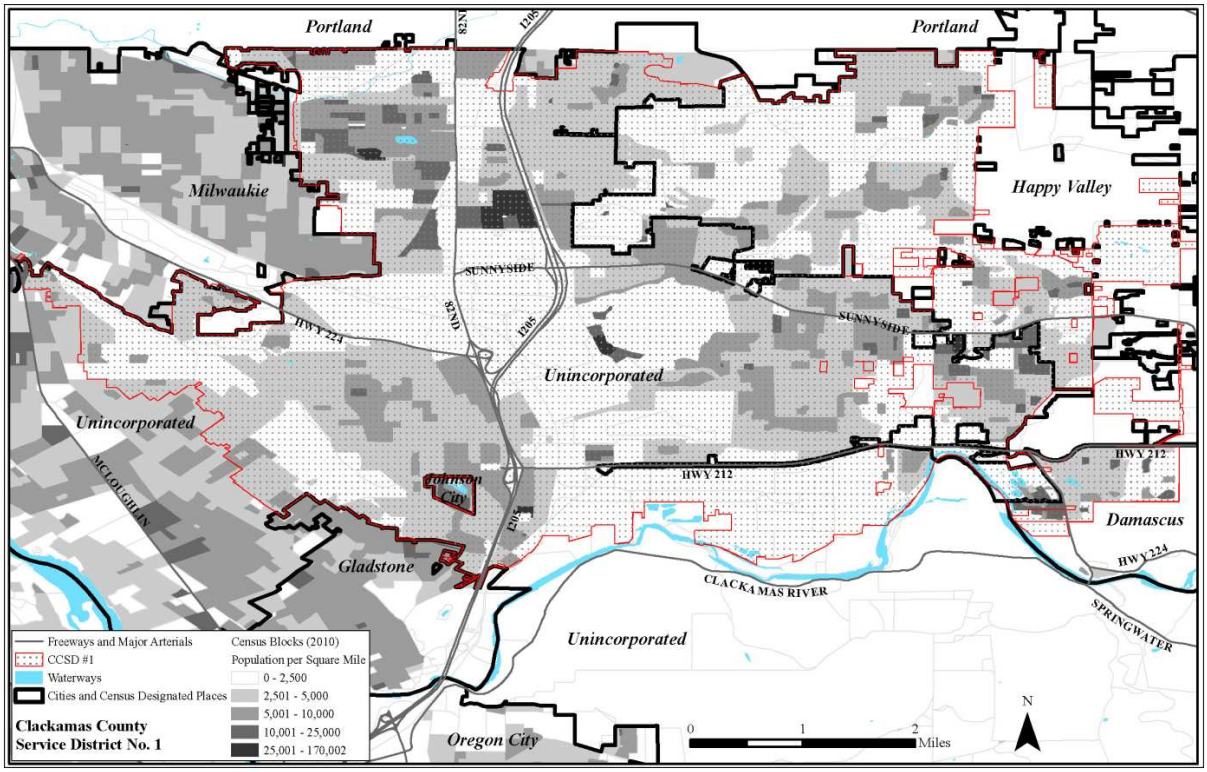


Figure 8. CCSD#1 Non-Contiguous Areas: Population per Square Mile

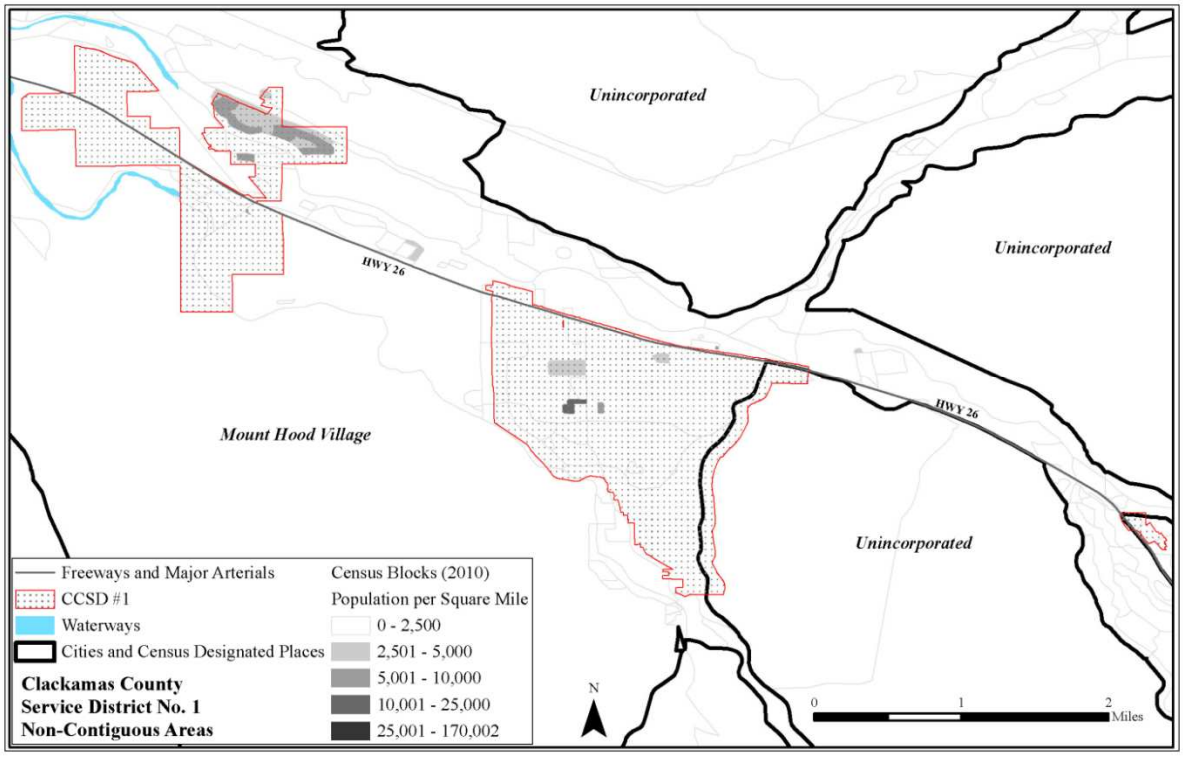


Figure 9. CCSD#1 All Damascus: Population per Square Mile

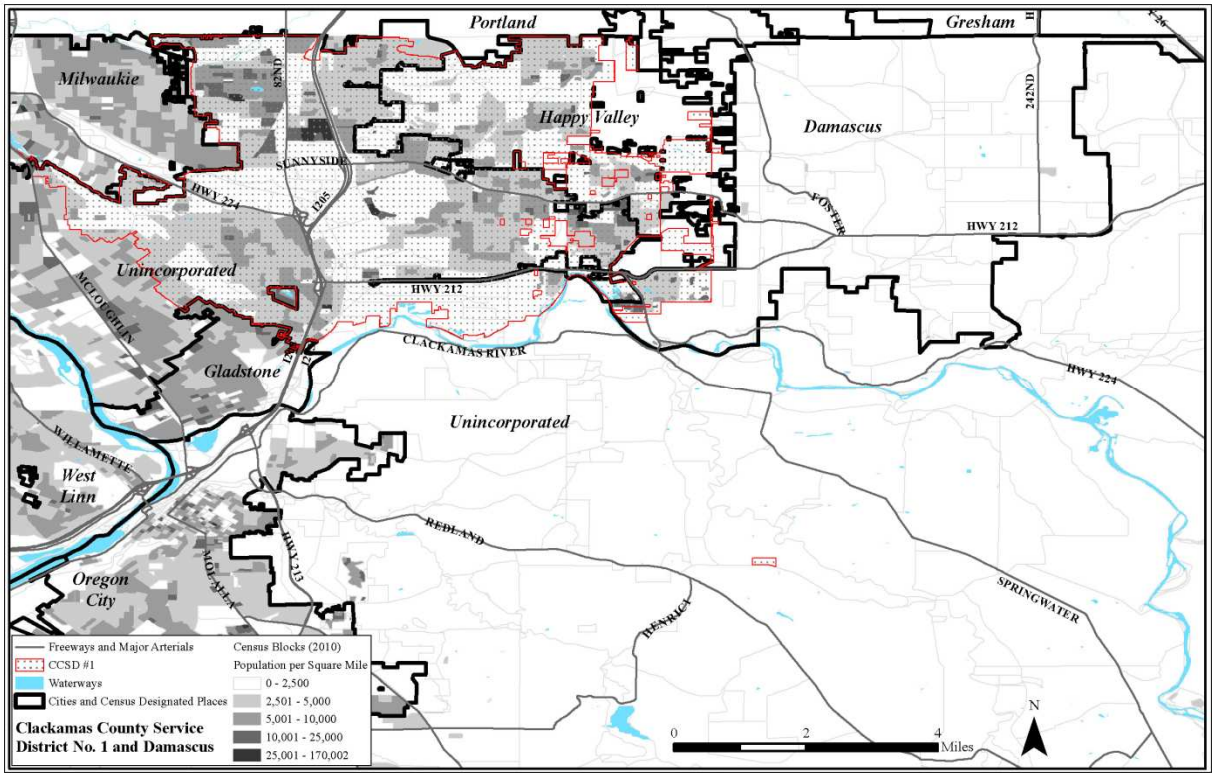
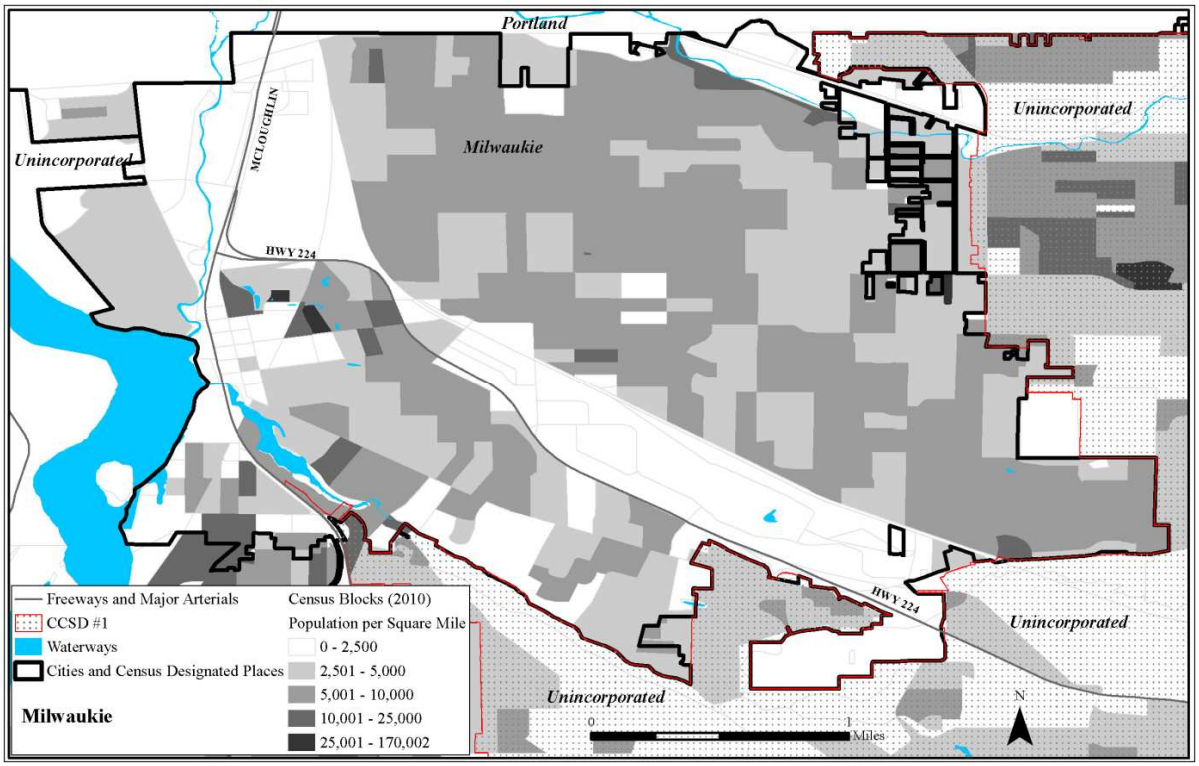


Figure 10. Milwaukie: Population per Square Mile



APPENDIX 7

Maps of Housing Density in the Study Areas

The following maps show the distribution of existing housing unit density in and around the project areas. For each study area, the map shows the number of housing units per square miles which is based on Census 2010 blocks.

Figure 11. TCSD: Housing Units per Square Mile

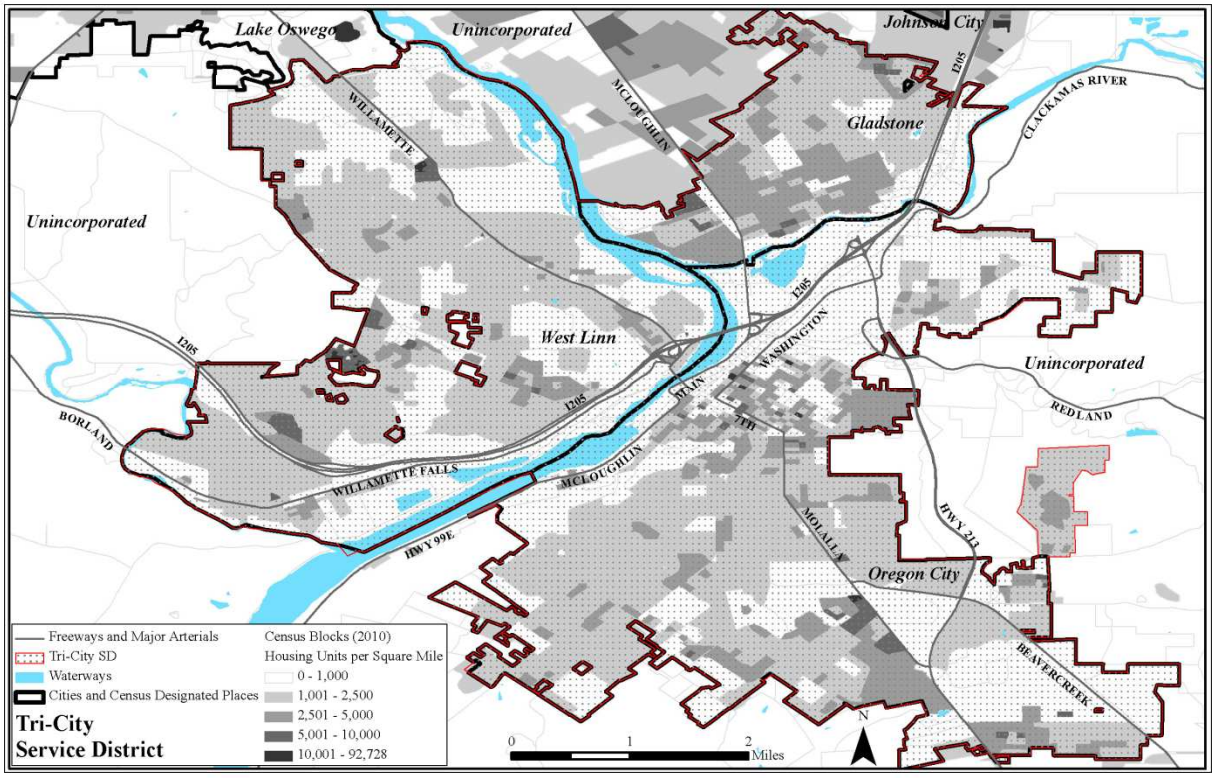


Figure 12. CCSD#1: Housing Units per Square Mile

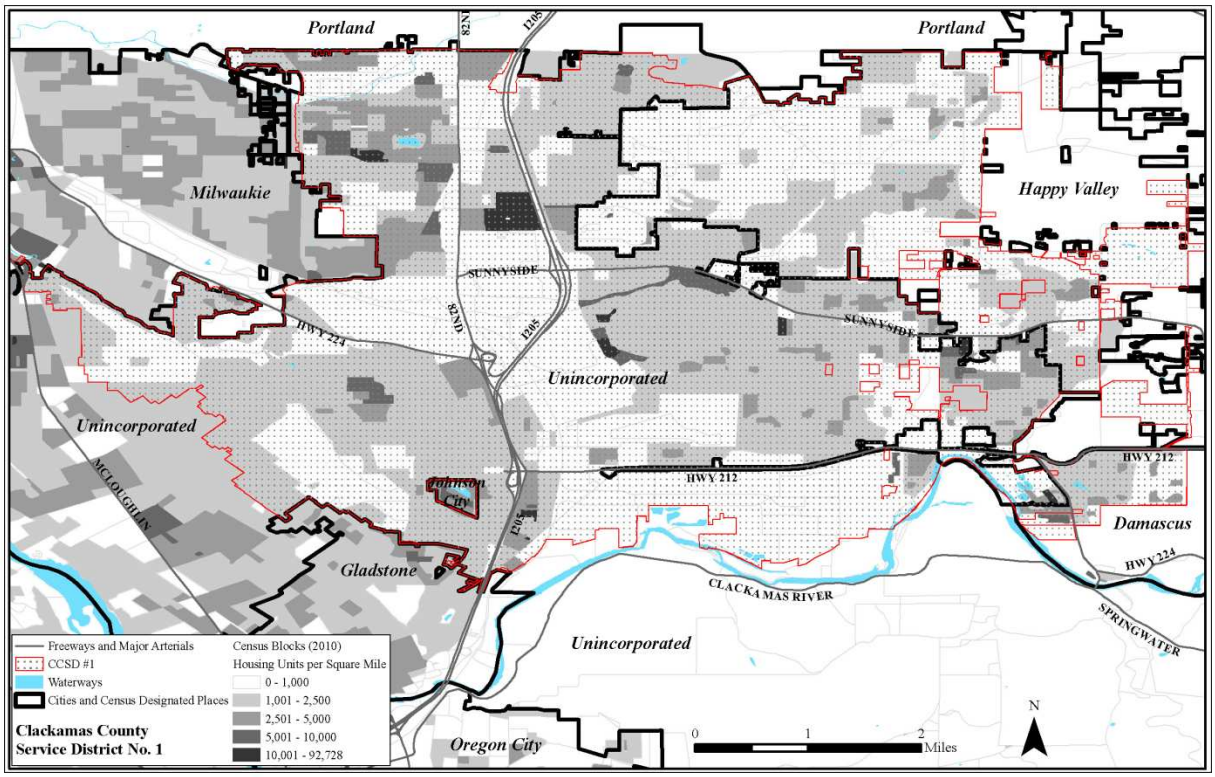


Figure 13. CCSD#1 Non-Contiguous Areas: Housing Units per Square Mile

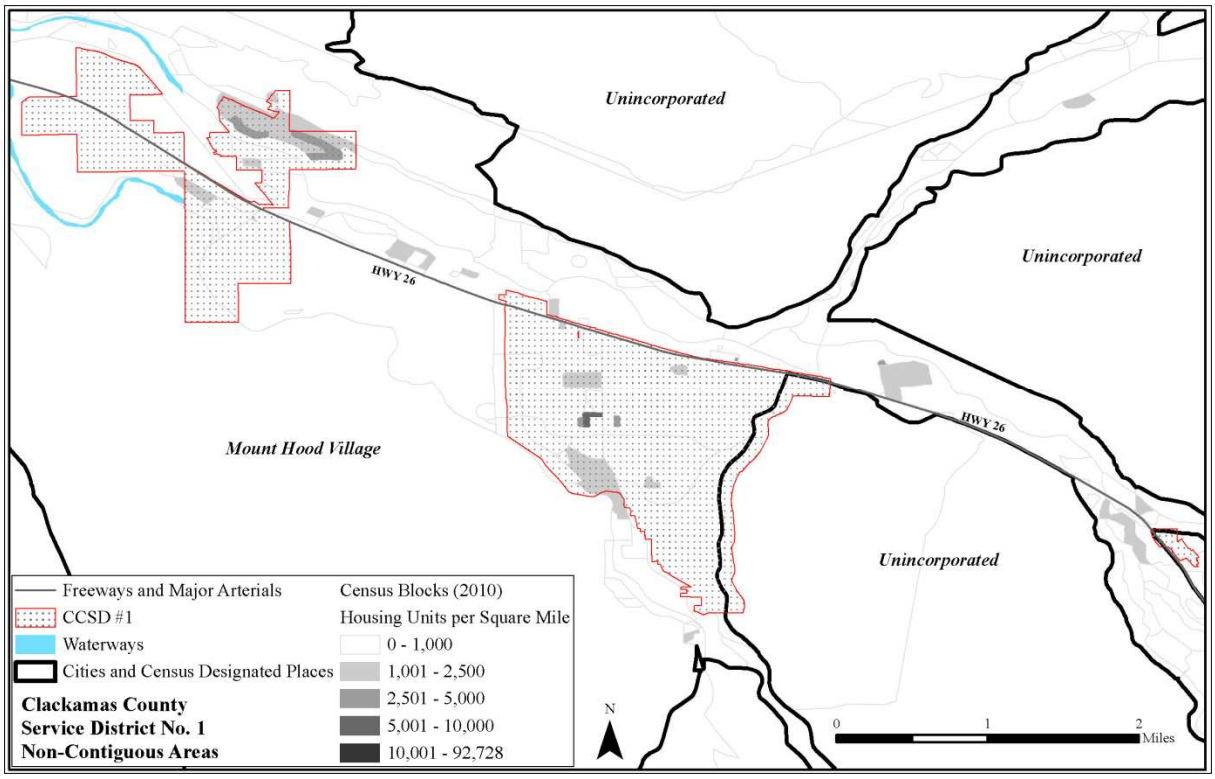


Figure 14. CCSD#1 All Damascus: Housing Units per Square Mile

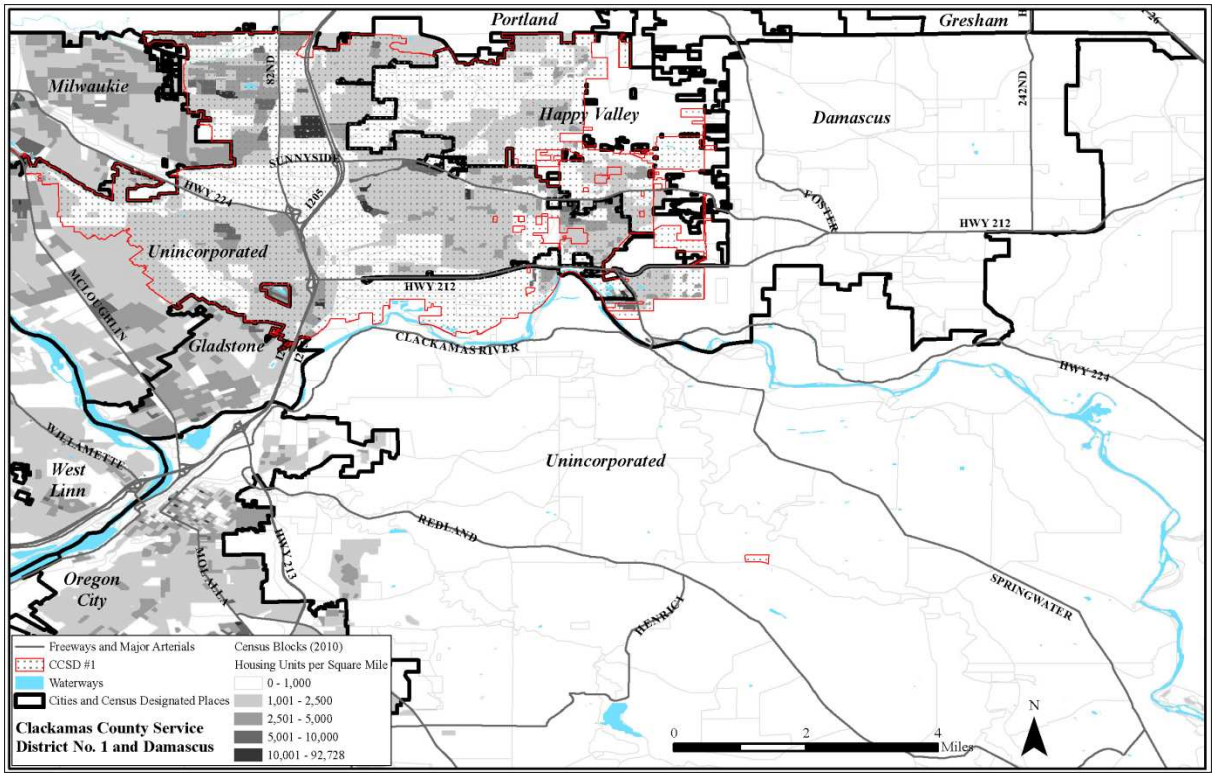
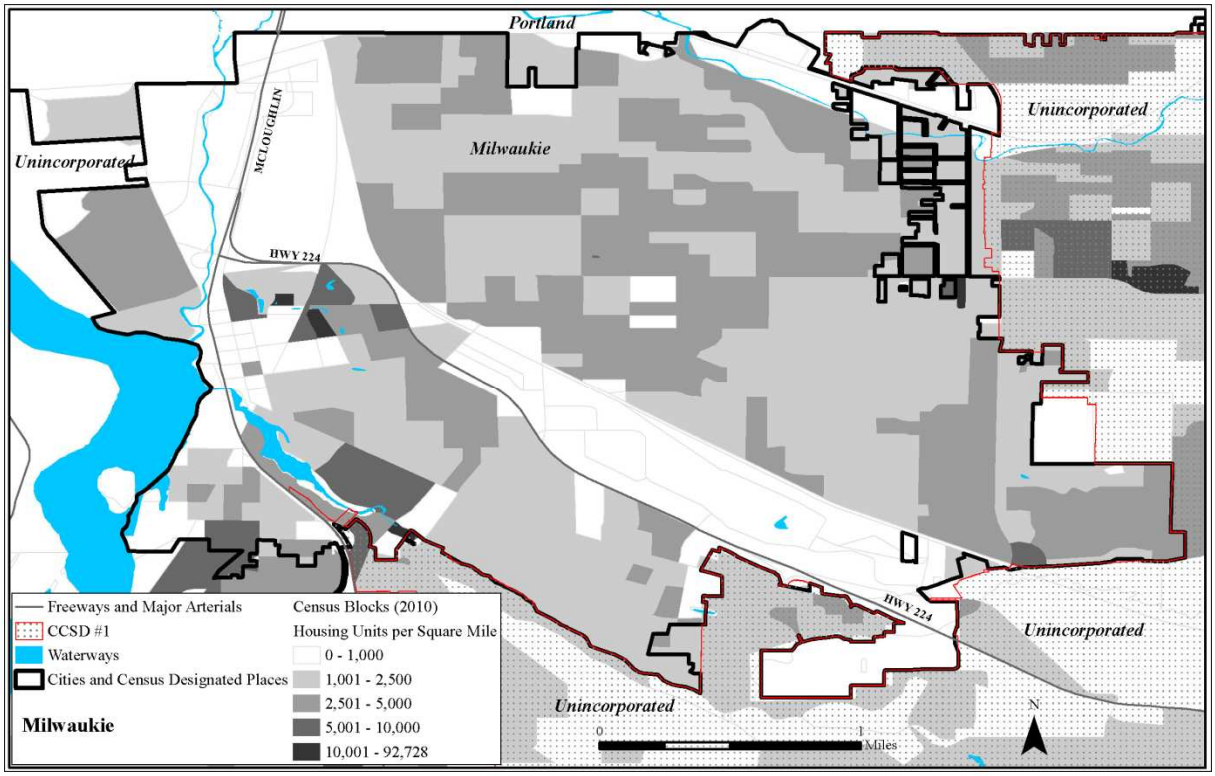


Figure 15. Milwaukie: Housing Units per Square Mile



APPENDIX 8

Data Sources and Description

The forecasts are based on data either explicitly entered into the forecasting models or used implicitly to make judgments about future trends. This population forecast report is based on data obtained from several sources. The data were compiled for each study area and their sub-areas (cities and unincorporated areas) and for Clackamas County. Census block and block-group level data for areas with boundaries that do not conform to Census geography were allocated and aggregated using GIS. The data sources include:

- **Decennial Census.** The decennial Census from the U.S. Census Bureau is the only source of data collected for small areas across the nation. We used 2000 and 2010 Census data to obtain the population by age and sex residing in the study areas, cities, and unincorporated areas. We compared the changes from 2000 to 2010 to develop an initial estimate of the age-sex profile for net migrants in the cohort-component models. Female populations ages 15-44 years were used with birth data to calculate fertility rates. In addition, data for population by race/ethnicity and housing were obtained from the two censuses.
- **American Community Survey.** These data from a U.S. Census Bureau survey are available for Census block groups. The American Community Survey (ACS) asks the similar or additional questions as the 2000 and 2010 Censuses. We used the 2005-2009 American Community Survey data to develop estimates of housing and population change, including estimates of net migration for the study areas. Mostly, the ACS data were used as supplemental information.
- **Annual Population Estimates.** Annual population estimates for cities and counties of Oregon are prepared by PRC as part of its Population Estimates Program. Data on state income tax returns, births, deaths, Medicare, and school enrollment as well as information about changes in housing stock and group quarters population are utilized in developing the population estimates. We used population estimates for Clackamas County and its cities and unincorporated area from 2000 to 2010 in this study to help to approximate growth trends in the study areas.

- **Group Quarters Data**. Data for the population residing in group quarters are form the decennial Censuses. Annual group quarters data for 2000-2010 for cities in and around the study areas were provided by PRC's Population Estimates Program.
- **Study Area Boundary Files.** The boundaries used in this study are those that were current in August 2011. Clackamas County provided the boundary files for the service districts. City boundaries are from Oregon Geospatial Enterprise Office and represent the 2010 city limits. These files are used for mapping and for aggregating demographic and other data unique to study area and its geographic components. Census data were compiled using the 2010 geographies.
- **Housing Data.** Housing data were obtained from two different sources. Annual questionnaire data from PRC's Population Estimates Program, and tax lot and housing unit datasets from Metro's Regional Land-use Information System data were used to estimate the number of housing units annually during 2000-2010, and to create a current housing inventory for each study area.
- **Birth and Death Data.** Information on births and deaths reported for the county and the project area from the years 2000 to 2010 were obtained from the Center for Health Statistics, Oregon Health Authority. Some data were available at geocoded points or identified by Census tract so that they were aggregated by each of the four study areas. The data were used for two purposes. One use was for calculating overall fertility and mortality rates for the county. These rates were used in the demographic models. The second use was to note the number of births in order to examine birth trends and the correspondence between births and population change.
- **Service District Customer Data.** Clackamas County provided customer data for Clackamas CCSD#1. The data represent households being served for select years during 2000-2010. These data were used for informational purposes only.
- **Other Background Information.** Comprehensive plans, transportation plans, and other planning reports and documents were examined to obtain background information. Additional information that city planners thought might have a bearing on the population forecasts were collected from most cities in the project area.

APPENDIX 9

Additional Data: Median Housing Value and Median Income

Tables 9A and 9B show the Median Household Income and Median Values of Owner-Occupied Housing Units in the Study Areas. Caution must be used in comparing U.S. Census data with ACS estimates as the methodology for data collection is different. Additionally, ACS estimates have margins of error (MOE), which are reported by the Census Bureau along with the data but not reported here.

- In TCSD, the median income levels and median values of housing units didn't increase over time from 2000 to 2009 when the last estimates are available. West Linn has higher incomes and housing values in TCSD.
- CCSD#1's areas which included the parts of the cities of Happy Valley and Damascus saw an increase in median household income and median housing value.
- The addition of Outer Damascus in CCSD#1D will bring more households with higher median income and higher median housing value.
- In Milwaukie, the median household income decreased from 2000 to 2009. However, the median value of occupied homes increased in the city.

Table9A. Median Household Income in the Study Areas

	Census 2000 (in 2009 Dollars)	2005-2009 ACS Estimates (2009 Dollars)
TCSD	$58,224	$50,393
TCSD: Gladstone	$54,134	$46,009
TCSD: Oregon City	$54,475	$47,451
TCSD: West Linn	$81,968	$76,768
CCSD#1	$60,921	$49,233
CCSD#1: Damascus	$58,732	$63,994
CCSD#1: Happy Valley	$97,771	$96,017
CCSD#1: Unincorporated	$54,275	$46,070
City of Damascus	$75,497	$76,979
City of Milwaukie	$54,351	$50,380

Source: US Census Bureau (Census 2000 and ACS 2005-2009 5 Year Estimates)

Table9B. Median Value of Occupied Housing Units in the Study Areas

	Census 2000 (in 2009 Dollars)	2005-2009 ACS Estimates (2009 Dollars)
TCSD	$228,777	$300,961
TCSD: Gladstone	$201,329	$247,734
TCSD: Oregon City	$203,252	$268,755
TCSD: West Linn	$302,618	$417,876
CCSD#1	$225,228	$312,287
CCSD#1: Damascus	$256,805	$348,583
CCSD#1: Happy Valley	$336,083	$432,941
CCSD#1: Unincorporated	$207,164	$270,227
City of Damascus	$299,488	$380,200
City of Milwaukie	$199,000	$238,100

Source: US Census Bureau (Census 2000 and ACS 2005-2009 5 Year Estimates)