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Corvallis School District: Population and Enrollment Forecasts, 2011-12 to 2020-21

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**CORVALLIS SCHOOL DISTRICT
POPULATION AND ENROLLMENT FORECASTS
2011-12 TO 2020-21**



FEBRUARY, 2011

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**Prepared By
Population Research Center
Portland State University**

FEBRUARY, 2011

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EXECUTIVE SUMMARY

This report presents the results of a demographic study conducted by the Portland State University Population Research Center (PRC). The study includes analysis of population, housing, employment, and school enrollment trends affecting the Corvallis School District (CSD) in recent years, estimates of the average number of CSD students living in single family homes, and forecasts of district-wide and individual school enrollments for the 2011-12 to 2020-21 school years.

Enrollment Trends

The Corvallis School District (CSD) enrolled 6,520 students in Fall 2010, a decrease of 98 students (1.5 percent) from Fall 2009. The loss occurred at each school level, including decreases of 30 students (1.1 percent) in grades K-5, 42 students (2.8 percent) in grades 6-8, and 26 students (1.1 percent) in grades 9-12.

Total K-12 enrollment has fallen in most years since peaking at more than 7,700 students in the mid-1990s. A steep decline in elementary enrollment in the 1990s occurred in the same period that high school enrollment was growing, illustrating the influence of different sized age cohorts on school enrollment. By the early 2000s, elementary enrollment began to stabilize, while high school enrollment began to decline. In the most recent two years, the poor economy has contributed to the enrollment decline at all school levels, but the long term enrollment losses are more closely related to the District's age structure.

The aging of the large "baby boom" population and their "echo boom" children was the biggest factor in the District's enrollment decline, but the impact of that generational shift has subsided. Children born in the peak birth year of 1990 have graduated from high school, and incoming kindergarten class sizes are relatively stable. If not for the recent job losses and housing slowdown, the District's overall K-12 enrollment in 2009-10 and 2010-11 would likely have been similar to or even larger than 2008-09 enrollment.

Housing and Enrollment

District-wide, an average of 0.31 CSD students live in each single family home; just under one student in every three homes. The average varies with the characteristics of the home. The characteristics measured in this study are the age of the home and the size of the lot. Similar to findings in other districts, newer homes average more school-age children than older homes, and homes on small lots average fewer children than those on larger lots. In detached homes built since 2000 there are an average of 0.49 CSD students per home.

Enrollment Forecast

The enrollment forecast is linked to a population forecast. The District's population is expected to increase at a relatively slow rate even if employment growth resumes. More workers commute into the CSD than out of it; job growth in Corvallis does not ensure equivalent population growth because more affordable housing options exist outside of the District.

In the next five years, total K-12 enrollment is forecast to be relatively stable. Elementary enrollments begin to grow by 2013 due to larger incoming kindergarten classes, corresponding to an increase in births. Over the 10 year forecast period, K-12 enrollment is forecast to increase by 297 students (five percent), reversing the 851 student (12 percent) decline experienced in the past 10 years. Most of the growth occurs at the elementary level; grades K-5 enrollment is forecast to increase by 271 students, grades 6-8 enrollment is forecast to increase by 52 students, and grades 9-12 enrollment is forecast to decrease by 26 students between Fall 2010 and Fall 2020.

Table 1 compares the historic and forecast growth for the District by five year increment. More detailed forecasts for the District may be found in Table 14 of this report.

**Table 1
Historic and Forecast Enrollment
Corvallis School District**

	Actual			Forecast	
	2000-01	2005-06	2010-11	2015-16	2020-21
District Total	7,371	6,742	6,520	6,561	6,817
5 year change		-629 -9%	-222 -3%	41 1%	256 4%
K-5	3,024	2,816	2,799	2,917	3,070
5 year change		-208 -7%	-17 -1%	118 4%	153 5%
6-8	1,792	1,518	1,479	1,431	1,531
5 year change		-274 -15%	-39 -3%	-48 -3%	100 7%
9-12	2,555	2,408	2,242	2,213	2,216
5 year change		-147 -6%	-166 -7%	-29 -1%	3 0%

Population Research Center, PSU. December 2010.

Individual School Forecasts

Forecasts for individual schools depict what future enrollments might be if current boundaries, grade configurations, and number of schools remain unchanged. Specific figures may be found in Table 15 of this report.

Individual school forecasts are based on recent trends as well as potential residential development. Adams, Hoover, and Wilson are the elementary schools with the greatest number of vacant residential parcels, based on PRC's analysis of the City of Corvallis' land development information. Those three schools and Garfield each add 51 to 58 students in the 10 year forecast period. Less growth is forecast at Jefferson and Lincoln, while Franklin and Mountain View's enrollments are about the same in Fall 2020 as in Fall 2010.

The District's secondary schools enrollments fluctuate based on the sizes of incoming and outgoing classes, but remain relatively stable over the forecast period, with only slightly more growth for Cheldelin Middle School and Crescent Valley High School than for Linus Pauling Middle School and Corvallis High School.

INTRODUCTION

The Corvallis School District (CSD) requested that the Portland State University Population Research Center (PRC) prepare enrollment forecasts for use in the District's planning. This report summarizes CSD enrollment history and local area population, housing, and economic trends, and presents new forecasts for a 10 year horizon from 2011-12 to 2020-21. Information sources include the U.S. Census Bureau, birth data from the Oregon Center for Health Statistics, city and county population estimates produced by PRC, county population forecasts from the Oregon Office of Economic Analysis, employment trends and forecasts from the Oregon Employment Department, and building permit, tax assessor, and residential development data from the cities and counties.

The District serves an area of about 190 square miles, including the cities of Corvallis and Adair Village, large portions of unincorporated Benton County extending several miles to the north and south of the City of Corvallis, and a small portion of unincorporated Linn County immediately east of Corvallis.

Following this introduction are sections presenting recent population, housing, employment, and enrollment trends within the District. Another section features estimates of the average number of CSD students living in various categories of single family homes. Next are the results of the district-wide enrollment forecasts and individual school forecasts, and a description of the methodology used to produce them. The final section contains a brief discussion of the nature and accuracy of forecasts.

POPULATION, EMPLOYMENT, AND HOUSING TRENDS, 1990 to 2010

During the decade between the 1990 and 2000 Censuses, total population within the boundaries of the CSD grew by eight percent, from 55,742 persons to 60,057. Over 98 percent of CSD residents live within the Benton County portion of the District (59,034 persons in 2000). Linn County accounts for the rest (1,023 persons in 2000). The District's rate of population growth during the 1990s was slightly less than the 10 percent growth experienced by Benton County overall, and significantly less than the 20 percent growth rate in the State of Oregon.

In February 2011, the 2010 Census population counts for cities, counties, and school districts were released. This information was not available when the forecast was completed, and population by sex and by detailed age will not be published until Summer 2011. Between 2000 and 2010 the District's population has continued to grow slowly, by about 10 percent in the decade, compared with 12 percent growth in the State of Oregon. The 1990, 2000, and 2010 populations of the City of Corvallis, the District itself, the two counties, and the State are shown in Table 2.

Table 2
City and Region Population, 1990, 2000, and 2010

	1990	2000	2010	Avg. Annual Growth Rate	
				1990-2000	2000-2010
City of Corvallis	44,757	49,322	54,462	1.0%	1.0%
City of Adair Village	554	536	840	-0.3%	4.6%
CSD Unincorporated	10,431	10,199	10,557	-0.2%	0.3%
CSD Total*	55,742	60,057	65,859	0.7%	0.9%
Benton County	70,811	78,153	85,579	1.0%	0.9%
Linn County	91,227	103,069	116,672	1.2%	1.2%
State of Oregon	2,842,321	3,421,399	3,831,074	1.9%	1.1%

Source: U.S. Census Bureau, 1990, 2000, and 2010 censuses.

*Note: School District population determined by PSU-PRC based on aggregation of census blocks within boundary shapefiles provided by CSD. The 2010 CSD population published by the Census Bureau is 65,449.

Although its population has not been growing rapidly, the City of Corvallis' status as a major employment center adds to the District's desirability as a residential location. An average commute time of 15.9 minutes for District residents, compared with 22.3 minutes statewide and

25.3 nationally, adds to its quality of life.¹ Among workers residing within the District, 55 percent have jobs that are located within the District, including a slight majority of jobs (51 percent) located within the City of Corvallis itself. Table 3 summarizes the workplaces of District residents. Some workers, such as most federal employees, are not included, but the data represent the home to work flow for most workers.

Table 3
Where CSD Residents Are Employed

Job Located Within*	Workers	Share
Corvallis School District	13,263	55%
City of Corvallis	12,338	51%
Benton County	14,044	59%
Linn County	2,652	11%
Marion County	1,489	6%
Lane County	1,435	6%
All other locations	4,379	18%
Total Primary Jobs	23,999	100%

**Note: Indentation indicates that the area is also included within the area above it. For example, workers in the City of Corvallis are also counted in the Corvallis School District.*

Source: US Census Bureau, LED Origin-Destination Data Base (2nd Quarter 2009). Jobs covered by unemployment insurance, generally excluding federal government, agricultural, self-employed and domestic workers. Includes at most one (primary) job per resident.

In addition to the 13,263 persons who both live and work within CSD, another 15,834 persons work in the District but live outside of it. Those who commute into the District for their primary job outnumber the 10,736 who commute out. This pattern is likely to continue in part due to the lower cost of housing in neighboring communities. Table 4 compares median housing values and rent in the five school districts that are home to about three quarters of those whose primary job is within the District. The values and rent are self-reported by households responding to the Census Bureau’s American Community Survey, and the five years that they span include great variation in the housing market, but Corvallis is clearly the District with the highest housing costs. Although average home sales prices fell by 13 percent in Benton County

¹ U.S. Census Bureau, 2007-2009 American Community Survey 3-Year Estimates.

between their 2007 peak and 2010, the decline was less severe than in Linn (19 percent), Marion (22 percent), or Polk (16 percent) Counties.²

Table 4
Jobs Within CSD: Where Workers Live
And Area Median Housing Costs

Resident School District	Primary Job Within CSD	Median Value*		Median Rent*	
		Estimate	Margin of Error (+/-)	Estimate	Margin of Error (+/-)
Corvallis SD	13,263	\$253,800	8,274	\$649	14
Greater Albany SD	4,123	\$187,000	4,799	\$610	18
Philomath SD	1,528	\$227,800	17,273	\$541	71
Lebanon Community SD	1,179	\$168,000	7,895	\$609	36
Salem-Keizer SD	918	\$195,800	2,883	\$593	9
All other locations	8,086	--	--	--	--
Total Primary Jobs	29,097	--	--	--	--

**Note: Median value, owner-occupied housing units and median contract rent, renter-occupied housing units within the specified district. Estimates are based on survey responses between January 2005 and December 2009, and are adjusted to 2009 dollars.*

Sources: US Census Bureau, LED Origin-Destination Data Base (2nd Quarter 2009, see Table 3); U.S. Census Bureau, 2005-2009 American Community Survey 5-Year Estimates, tables B25058 and B25077.

Benton County typically has a lower unemployment rate than the State of Oregon. The most recent estimate, December 2010, shows a 7.3 percent seasonally adjusted unemployment rate for the County, compared with 10.6 percent for the state. However, the County lost more than 2,000 jobs during the recent recession. Between 2007 and 2010 the County's six percent decline in nonfarm employment was only slightly better than the State's eight percent loss. Linn County, which had a 13.0 percent seasonally adjusted unemployment rate in December 2010, lost 11 percent of its nonfarm jobs between 2007 and 2010.

Although the steepest job losses occurred between mid-2008 and late-2009, recent data do not yet point to a recovery. December 2010 figures from the Oregon Employment Department show that nearly all private-sector industries in Benton County lost jobs over the past 12

² Willamette Valley Multiple Listing Service, "2010 Real Estate Review." January 2011.

months. Furthermore, “in the past 24 months Benton County’s manufacturing sector has shed more than 1,000 jobs, a 25 percent decrease in employment.”³

The residential building permit data presented in Table 5 demonstrate the extent of the slowdown in new home construction that followed the overheated housing market and subsequent job losses. Activity may have bottomed out during the 12 month period between September 2009 and August 2010, when only 26 building permits were issued for single family homes. In the five months since then, permits for 22 homes have been issued. Single family homes that have been completed through the end of 2009, based on tax assessment information, are grouped by attendance area in Table 6. Additional details about the location of new housing and the potential for additional residential development is presented in the “Enrollment Forecasts” section.

Table 5
Housing Units Authorized by Building Permits

Year Permit Issued	City of Corvallis	
	Single Family	Multiple Family
1996	209	371
1997	134	55
1998	121	114
1999	81	134
2000	129	22
2001	162	466
2002	250	4
2003	195	153
2004	195	71
2005	220	162
2006	194	50
2007	99	16
2008	60	0
2009	39	0
2010	37	18
2011 (January)	4	0

Sources: U.S. Census Bureau, Residential Construction Branch. Data available online at <http://censtats.census.gov/bldg/bldgprmt.shtml>. December 2010 and January 2011 data from City of Corvallis.

³ Benton-Linn Labor Trends, Oregon Employment Department, February 2011.

**Table 6
Corvallis School District
New Single Family Homes By Attendance Area**

Elementary Area*	Year Built										2000-09
	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	Total
Adams	56	96	87	81	75	87	104	42	15	13	656
Garfield	4	5	10	8	4	6	3	3	5	11	59
Hoover	32	19	36	17	41	20	18	14	4	5	206
Jefferson	2	2	6	5	4	10	5	6	1	4	45
Lincoln	11	27	66	67	47	68	76	52	8	11	433
Mountain View	11	37	49	70	18	31	12	18	8	8	262
Wilson	6	6	112	36	20	17	14	15	10	7	243
District	122	192	366	284	209	239	232	150	51	59	1904
Middle School Area*											
Cheldelin	49	62	197	123	80	68	44	47	22	20	712
Pauling	73	130	169	161	129	171	188	103	29	39	1192
District	122	192	366	284	209	239	232	150	51	59	1904
High School Area*											
Corvallis	73	130	169	161	129	171	188	103	29	39	1192
Crescent Valley	49	62	197	123	80	68	44	47	22	20	712
District	122	192	366	284	209	239	232	150	51	59	1904

*Note: Current (2010-11) attendance area.

Source: Compiled by Population Research Center, PSU, from Benton and Linn County taxlot attribute data. Excludes most manufactured homes and all tax-exempt properties.

ENROLLMENT TRENDS

Districtwide Enrollment

The Corvallis School District (CSD) enrolled 6,520 students in Fall 2010, a decrease of 98 students (1.5 percent) from Fall 2009. The loss occurred at each school level, including decreases of 30 students (1.1 percent) in grades K-5, 42 students (2.8 percent) in grades 6-8, and 26 students (1.1 percent) in grades 9-12.

Total K-12 enrollment has fallen in most years since peaking at more than 7,700 students in the mid-1990s. A steep decline in elementary enrollment in the 1990s occurred in the same period that high school enrollment was growing, illustrating the influence of different sized age cohorts on school enrollment. By the early 2000s, elementary enrollment began to stabilize, while high school enrollment began to decline. In the most recent two years, the poor economy has contributed to the enrollment decline at all school levels, but the long term enrollment losses are more closely related to the District's age structure.

The college-age population is consistently the largest group in Corvallis, but the sizable baby boom population has maintained its influence on the area's demographics as it has aged. In 1990, one out of every six CSD residents was between the ages of 30 to 39. In 2000, persons age 40 to 49 outnumbered those age 30 to 39 by 19 percent. By 2010, this large cohort was in its 50s. The "echo" of the baby boom consisted of an increase in births in the late 1980s that began to wane after 1990. As the population of women of childbearing age declined, fertility rates for women under age 30 also fell, leading to a decrease in births even as population grew in the 1990s and 2000s.

Although total enrollment has declined, the District's Latino enrollment has more than doubled in the past 10 years, from about 420 students in Fall 2000 to about 860 in Fall 2010. In contrast to the aging non-Latino white population, a large share of Latinos are in prime childbearing age groups. Among all residents age 25 and over, 31 percent of Latinos are between age 25 and 34,

compared with only 14 percent of non-Latino whites. Median age for Latino residents is 21, compared with 30 for non-Latino whites.⁴

Oregon and U.S. fertility rates may have dropped further due to the current recession, but the effects of the aging population on K-12 school enrollment have run their course. Children born in the peak birth year of 1990 have graduated from high school, and incoming kindergarten class sizes are relatively stable. If not for the recent job losses and housing slowdown, the District's overall K-12 enrollment in 2009-10 and 2010-11 would likely have been similar to or even larger than 2008-09 enrollment.

Table 7 summarizes the enrollment history for the District by grade level annually for the past 10 years, from 2000-01 to 2010-11. Notice the five year change summaries at the bottom of the table. All grade levels experienced large decline in the 2000-01 to 2005-06 period, but only high school enrollments fell significantly in the 2005-06 to 2010-11 period.

Private and Home School Enrollment and District "Capture Rate"

There are a few small private schools in the Corvallis area that each enroll fewer than 50 children in kindergarten or primary grades, but only three larger schools serving a range of grade levels. The largest is Santiam Christian, which enrolls 361 students in grades K-8 and 252 students in grades 9-12. Enrollment has declined from the 2005-06 to 2007-08 school years, when it enrolled about 500 students in grades K-8 and more than 300 in grades 9-12. Santiam Christian is located at the northern edge of the CSD, in Adair Village, but only 36 percent of its students come from Corvallis or Adair Village. More than half of its students come from Polk and Linn County communities that are outside of the CSD.⁵ Ashbrook Independent School, with 145 students, and Zion Lutheran School, with 167 students, are both located in the City of Corvallis and serve grades K-8. They have maintained or slightly increased their enrollment over the past several years.

⁴ U.S. Census Bureau, 2005-2009 American Community Survey 5-Year Estimates, Tables B01001H, B01001I, B01002H and B01002I.

⁵ Santiam Christian Schools, 2010-11 School Profile.

**Table 7
Corvallis School District, Enrollment History, 2000-01 to 2010-11**

Grade	2000-01	2001-02	2002-03	2003-04	2004-05	2005-06	2006-07	2007-08	2008-09	2009-10	2010-11
K	441	445	456	436	449	435	446	428	459	436	434
1	480	468	496	496	457	482	458	483	469	472	465
2	492	479	455	491	498	462	477	453	484	473	472
3	525	484	471	463	478	502	471	496	487	484	469
4	540	540	481	486	466	472	523	465	493	482	486
5	546	563	528	484	466	463	482	528	463	482	473
6	555	544	545	506	502	482	488	502	530	471	478
7	614	568	545	536	514	504	495	500	512	526	473
8	623	609	552	554	531	532	521	504	518	524	528
9	639	693	660	643	654	614	657	636	637	661	672
10	654	640	678	622	603	598	573	604	587	554	587
11	590	625	607	612	608	590	584	572	542	520	479
12	672	565	600	604	616	606	585	555	543	533	504
Total	7,371	7,223	7,074	6,933	6,842	6,742	6,760	6,726	6,724	6,618	6,520
<i>Annual change</i>		-148 -2.0%	-149 -2.1%	-141 -2.0%	-91 -1.3%	-100 -1.5%	18 0.3%	-34 -0.5%	-2 0.0%	-106 -1.6%	-98 -1.5%
K-5	3,024	2,979	2,887	2,856	2,814	2,816	2,857	2,853	2,855	2,829	2,799
6-8	1,792	1,721	1,642	1,596	1,547	1,518	1,504	1,506	1,560	1,521	1,479
9-12	2,555	2,523	2,545	2,481	2,481	2,408	2,399	2,367	2,309	2,268	2,242

	5 Year Change: 2000-01 to 2005-06		5 Year Change: 2005-06 to 2010-11		10 Year Change: 2000-01 to 2010-11	
	Change	Pct.	Change	Pct.	Change	Pct.
K-5	-208	-7%	-17	-1%	-225	-7%
6-8	-274	-15%	-39	-3%	-313	-17%
9-12	-147	-6%	-166	-7%	-313	-12%
Total	-629	-9%	-222	-3%	-851	-12%

*Note: Includes charter schools, but does not include special programs (FARM Home School and YES House)
Source: Corvallis S.D.*

Private schools within the CSD enroll local students as well as students from beyond the CSD boundaries; conversely, CSD residents can attend private schools located in other communities. Therefore, the number of students enrolled in private schools physically located within the District cannot be used to measure overall private school share. The best source for private school enrollment by residence is census data. The 2000 Census and the more recent American Community Survey (ACS) included questions about school enrollment by level and by type (public or private). In 2000, nine percent of the K-12 students living in the District were enrolled in private schools. The ACS estimates based on surveys conducted from 2005 to 2009 indicate that 10 percent of CSD K-12 students were enrolled in private schools.

Another difference between CSD enrollment and child population can be attributed to home schooling. Home schooled students living in the District are required to register with the Linn Benton Lincoln Education Service District (LBLED), though the statistics kept by the LBLED are not precise because students who move out of the area are not required to drop their registration. Students who enroll in public schools after being registered as home schooled are dropped from the home school registry. In February 2011 there were 227 CSD residents registered as home schooled, including 91 high school age children.⁶ This accounts for just fewer than three percent of total 1st-8th grade residents and four percent of total 9th-12th grade residents. Like enrollment in CSD public schools and at Santiam Christian, the number of home-schooled students has fallen in the past five years, from 262 children in February 2006 to 227 today. Conversely, home schooling of high school students has increased from 57 students five years ago to 91 today.

For purposes of forecasting enrollment, the ratios of kindergarten and first grade public school enrollment to overall population in the corresponding ages are very important. These ratios are called "capture rates." Once a student is enrolled in the public schools in first grade, it is very likely that they will continue to be enrolled in subsequent grades, unless their family moves out of the District. At the time of the 2000 Census, the kindergarten capture rate was 0.78, and the first grade capture rate was 0.80. That means that about 22 percent of kindergarten-age children and 20 percent of first grade age children were not enrolled in CSD schools. These children include students who were enrolled in private schools, net transfers to and from other

⁶ Northwest Regional Education Service District, *2009-10 Annual Report*.

public school districts, home schooled students, or children not yet attending school, since school is not compulsory until age seven.

Individual School Enrollment

Total enrollment at each of the District's schools and recent enrollment trends by school are shown in Table 8 on the next page. Enrollment change is calculated for the 2005-06 to 2010-11 five year interval, although enrollments are not strictly comparable due to the closure of Inavale after the 2005-06 school year, elementary boundary changes between the 2007-08 and 2008-09 school years, and the reassignment of a small portion of the former Cheldelin Middle School attendance area to Linus Pauling Middle School, also between the 2007-08 and 2008-09 school years. Lincoln's larger enrollment between 2006-07 and 2009-10 reflects its K-8 configuration during those years.

Table 8
Enrollment History for Individual Schools, 2005-06 to 2010-11

School	Historic Enrollment						5 year change 2005-06 to 2010-11	
	2005-06	2006-07	2007-08	2008-09	2009-10	2010-11	Number	Percent
Adams ¹	460	465	445	417	411	390	-70	-15.2%
Franklin K-8	367	350	333	324	320	329	-38	-10.4%
Garfield	372	396	380	377	369	380	8	2.2%
Hoover	408	413	406	410	405	419	11	2.7%
Inavale K-8	179						-179	
Jefferson ¹	318	324	322	347	331	329	11	3.5%
Lincoln ²	287	401	444	425	388	325	38	13.2%
Mountain View ¹	384	420	421	376	362	344	-40	-10.4%
Wilson ¹	287	301	316	346	379	369	82	28.6%
Elementary Schools	3,062	3,070	3,067	3,022	2,965	2,885	-177	-5.8%
Cheldelin M.S.	576	598	588	640	615	598	22	3.8%
Linus Pauling M.S.	696	693	704	692	698	724	28	4.0%
Middle Schools	1,272	1,291	1,292	1,332	1,313	1,322	50	3.9%
Corvallis H.S.	1,366	1,360	1,330	1,263	1,216	1,154	-212	-15.5%
Crescent Valley H.S.	1,042	1,039	1,037	1,046	1,052	1,088	46	4.4%
High Schools	2,408	2,399	2,367	2,309	2,268	2,242	-166	-6.9%
District-run Schools	6,742	6,760	6,726	6,663	6,546	6,449	-293	-4.3%
Muddy Creek Charter School				61	72	71	71	
Grand Totals	6,742	6,760	6,726	6,724	6,618	6,520	-222	-3.3%

1. Boundary adjustments between the 2007-08 and 2008-09 school years increased the size of the Jefferson and Wilson attendance areas and decreased the size of the Adams and Mountain View areas, affecting new students. Existing students could remain at their old school.

2. Lincoln's enrollment includes grades 6-8 between 2006-07 and 2009-10.

Source: Corvallis School District, September 30 Enrollment.

HOUSING AND ENROLLMENT

How many children are expected to live in future new homes and attend CSD schools? Because each development is unique, the number of resident public school students may depend on factors other than the number of homes. These factors include affordability, proximity to schools, the number of bedrooms, and the presence or absence of child-friendly amenities within the development and in the surrounding neighborhood. However, we can measure the current average number of CSD students per existing housing unit. These figures help to inform the enrollment forecasts for individual schools, and they can be used by District staff on an *ad hoc* basis to estimate potential student generation from planned and proposed developments.

We estimated the Fall 2010 number of students per housing unit in a geographic information system (GIS), combining student address points with tax lots and their associated attributes. For detached homes built between 2000 and 2009, the average number of CSD K-12 students was 0.49, or about one student in every two homes. The rates are near or slightly below those we have measured for new single family homes in recent studies for large school districts in suburban Portland.⁷ Detached homes built in the 1990s had a lower average of 0.41 K-12 students, largely because these 10 to 20 year old homes had fewer elementary students. The average number of high school students in these homes was higher than in the newer homes. Homes built before 1990 have an average of just 0.28 CSD K-12 students per home, with fewer students at both the elementary and secondary levels compared with homes built since 1990.

Table 9 includes the rates for detached homes as well as for attached, or zero-lot line homes. A growing number of homes have been built on smaller subdivided parcels in the City of Corvallis. “Attached” may be a misnomer; some are attached and some are not. The parcel attribute data is insufficient to provide the structural detail, so all homes on lot sizes of smaller than 3,400 square feet were included in the analysis. Whether the homes are attached or not, they share the characteristic of having fewer students enrolled in CSD schools, on average. Similar to detached homes, the newest homes on small lots have higher student generation rates than

⁷ For example, 0.49 in the Oregon City School District, 0.59 in the Tigard-Tualatin School District, and 0.69 in the North Clackamas School District.

older ones. Homes on small lots are generally more affordable, and higher rates for K-5th grade and 6th-8th grade compared with 9th-12th grade indicate that young families are part of the market for these homes.

Table 9
Average Number of CSD Students per Single Family Home, Fall 2010
By Age of Home and Grade Level

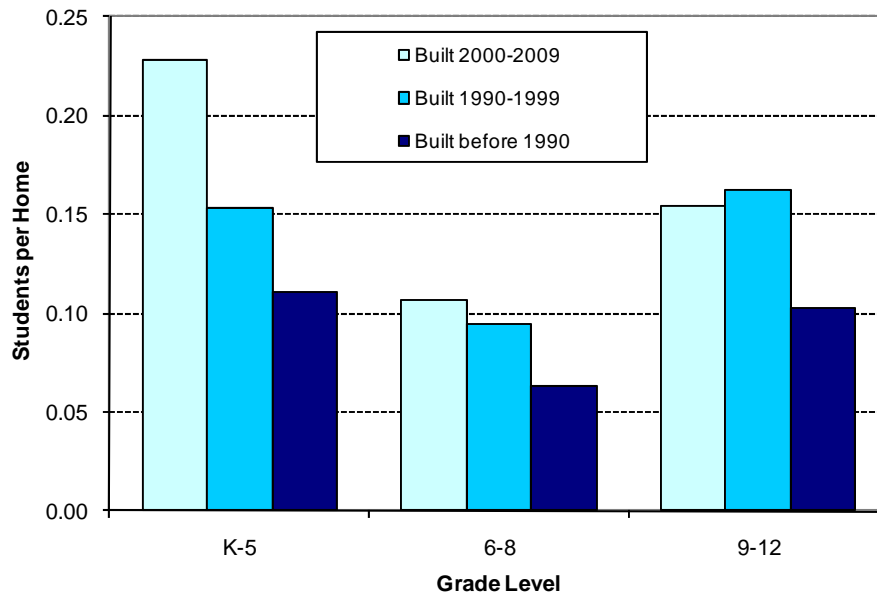
	Grade Level			
	K-5	6-8	9-12	K-12
Single Family Homes	0.13	0.07	0.11	0.31
Detached Single Family Homes	0.13	0.07	0.12	0.32
Built 2000-2009	0.23	0.11	0.15	0.49
Built 1990-1999	0.15	0.09	0.16	0.41
Built before 1990	0.11	0.06	0.10	0.28
Attached Single Family Homes*	0.10	0.05	0.04	0.19
Built 2000-2009	0.20	0.09	0.05	0.34

**Homes on lots smaller than 3,400 square feet and attached homes identified regardless of lot size.*

Source: Data compiled by PSU-PRC, using CSD student data and geographic shape files from Benton County. Includes students attending special programs.

These same Fall 2010 student generation rates are shown in Chart 1, illustrating the “aging in place” that occurs in single family homes. On average, homes that are 10-20 years old have fewer young children than homes that are less than 10 years old. As the older children graduate from high school, the homes built in the 1990s will soon have even fewer K-12 residents, much like the homes built before 1990 that are now more than 20 years old. Although younger families may eventually occupy the older homes, owner-occupied homes turn over to new owners very gradually, and the new owners will represent a diverse mix of households that may not include as many families with children as the newer tract homes.

Chart 1
CSD Students per Single Family Home*, Fall 2010



** Detached homes on lots larger than 3,400 square feet.*

ENROLLMENT FORECASTS

District-wide Long-range Forecast Methodology

To ensure that enrollment forecasts are consistent with the dynamics of likely population growth within the District, we combine the grade progression enrollment model with a demographic cohort-component model used to forecast population for the District by age and sex. The components of population change are births, deaths, and migration. Using age-specific fertility rates, age-sex specific mortality rates, age-sex specific migration rates, estimates of recent net migration levels, and forecasts of future migration levels, each component is applied to the base year population in a manner that simulates the actual dynamics of population change.

The 1990 and 2000 Census results are used as a baseline for the population forecasts. By “surviving” the 1990 population and 1990s births (estimating the population in each age group that would survive to the year 2000) and comparing the “survived” population to the actual 2000 population by age group, we are able to estimate the overall level of net migration between 1990 and 2000 as well as net migration by gender and age cohort. The net migration data was used to develop initial net migration rates, which were used as a baseline for rates used to forecast net migration for the 2000 to 2020 period.

We estimated the number of births to women residing within the District each year from 1989 to 2007, using data from the Oregon Department of Human Services, Center for Health Statistics. Detailed information including the age of mothers enabled us to calculate fertility rates by age group for both 1990 and 2000. We adjusted the future fertility rates to reflect trends of decreasing fertility rates for women under age 25 and increases for women age 30 and older. These trends are based on state and national observations, as well as the number of births by age of mother occurring within the District during the 2001 to 2005 period for which detailed birth data is available.

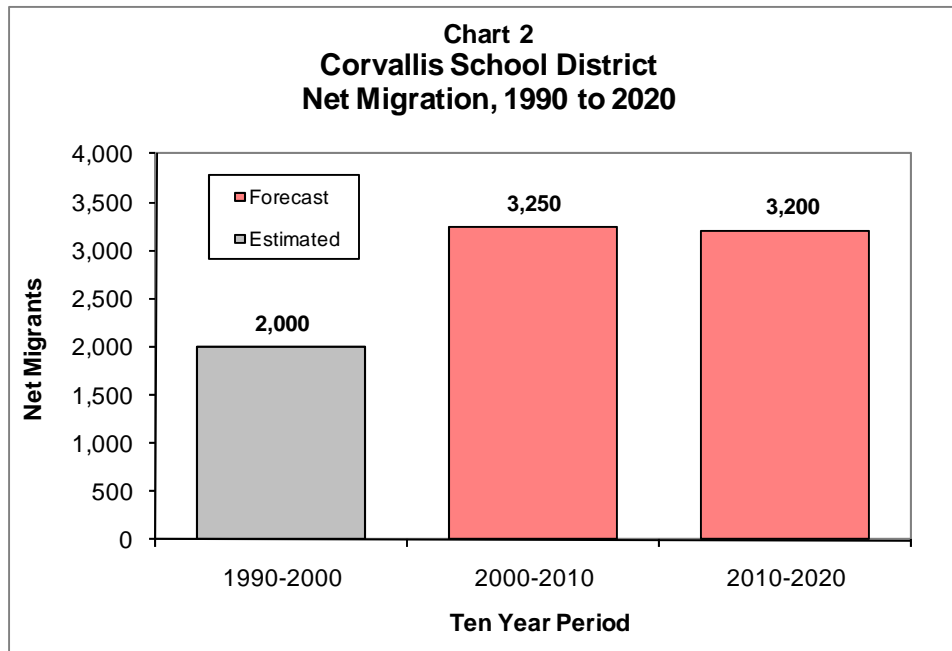
Historic school enrollment is linked to the population forecast in two ways. First, the kindergarten and first grade enrollments at the time of the most recent census (the 1999-2000 school year) are compared to the population at the appropriate ages counted in the census. The

“capture rate,” or ratio of enrollment to population, is an estimate of the share of area children who are enrolled in CSD schools. Assumptions for capture rates based on census data are used to bring new kindergarten and first grade students into the District’s enrollment. If there is evidence that capture rates have changed since the time of the census, they may be adjusted in the forecast.

The other way that historic population and enrollment are linked is through migration. Annual changes in school enrollment by cohort closely follow trends in the net migration of children in the District’s population. Once the students are in first grade, a set of baseline grade progression rates (GPRs) are used to move students from one grade to the next. These rates, usually 1.00 for elementary grades, represent a scenario under which there is no change due to migration. Enrollment change beyond the baseline is added (or subtracted, if appropriate) at each grade level depending on the migration levels of the overall population by single years of age.

Population Forecast

Population counts from the 2010 Census were not yet available when the forecast was prepared, but a substantial amount of other data was available to compare the 2000 to 2010 forecast interval with the 1990 to 2000 baseline period. These data include school enrollment, births, housing development data, and estimates from the Census Bureau’s American Community Survey (ACS) and Small Area Income and Poverty Estimates (SAIPE). All indicate that population gains within the District in the decade ending in 2010 were slightly lower than in the 1990s. Natural increase (births minus deaths) was lower in the 2000s because there were about 540 fewer births than in the 1990s. At the same time, the aging population contributed to an increasing number of deaths. Net migration (people moving in minus those moving out) was higher in the 2000s than in the 1990s. Chart 2 shows the 1990 to 2000 estimate and 2000 to 2020 forecasts of CSD population growth attributable to net migration.



The forecast of births depends on age-specific fertility rates (ASFRs), calculated for five year age groups by dividing the number of births occurring to District residents of a specific age group into the overall population in the same age group. Due to the large college student population in Corvallis, only a small share of the population under age 25 are forming families and having children. Statewide ASFRs for women in their late teens and early 20s were three to four times higher than those in the CSD. For women in their 30s, ASFRs in the CSD have been higher than statewide rates, a pattern typical of places with high educational attainment.

Future births are dependent on two factors — the size of the population in child-bearing ages and fertility rates. The current recession has caused declines in U.S. fertility rates, and future rates are difficult to predict. However, the young adult population is expected to increase because of overall population growth and the larger baby boom “echo” cohort born in the late 1980s and early 1990s. This increase should cause the number of births within the CSD to increase throughout the forecast period even fertility rates are stable or decline slightly. Table 10 shows historic births from 1990 to 2007 as well as forecasts from 2008 until 2015, the period that will have an impact on the enrollment forecasts presented in this study.

Table 10
Estimated and Forecast Births
Corvallis School District

Year	Births
1990	674
1991	637
1992	563
1993	622
1994	571
1995	609
1996	647
1997	637
1998	600
1999	591
2000	545
2001	632
2002	563
2003	541
2004	537
2005	548
2006	568
2007	585
2008	543
2009	553
2010 (forecast)	585
2011 (forecast)	586
2012 (forecast)	588
2013 (forecast)	591
2014 (forecast)	597
2015 (forecast)	602

Source: 1990-2009 birth data from Oregon Center for Health Statistics allocated to CSD boundary by PSU-PRC. 2010-2015 forecasts, PSU-PRC.

The district-wide population forecast by age group is presented in Table 11. The forecast for 2020 population in the CSD is 67,023, an increase of 6,966 persons from the 2000 Census (0.6 percent average annual growth). The 2000 to 2020 growth rate of 13 percent for the District is lower than the 18 percent growth in the State of Oregon Office of Economic Analysis' 2004 forecast for Benton County, but consistent with the City of Corvallis 1998 Comprehensive Plan forecast of 14 to 19 percent growth in the City, given that slower growth is likely in the balance of the District outside of the City. School-age population (5 to 17) declined significantly between 2000 and 2010. Age 5 to 9 population is forecast to rebound by 2020, though age 10 to 17

population may continue to decline somewhat. By 2020, the fastest growth is among residents in their 60s and 70s.

Table 11
Population by Age Group
Corvallis School District, 1990 to 2020

	1990 Census	2000 Census	2010 Forecast*	2020 Forecast	2000 to 2020 Change	
					Number	Percent
Under Age 5	3,324	2,891	2,736	2,980	89	3%
Age 5 to 9	3,393	3,010	2,925	3,032	22	1%
Age 10 to 14	2,995	3,393	3,134	2,993	-400	-12%
Age 15 to 17	1,633	2,136	1,859	1,750	-386	-18%
Age 18 to 19	4,126	4,357	4,601	4,740	383	9%
Age 20 to 24	9,752	10,305	11,103	11,082	777	8%
Age 25 to 29	4,592	4,685	5,263	5,410	725	15%
Age 30 to 34	4,675	3,521	3,732	4,015	494	14%
Age 35 to 39	4,643	3,588	3,433	4,010	422	12%
Age 40 to 44	3,557	4,133	3,176	3,375	-758	-18%
Age 45 to 49	2,593	4,298	3,393	3,246	-1,052	-24%
Age 50 to 54	1,862	3,473	4,123	3,167	-306	-9%
Age 55 to 59	1,693	2,304	3,905	3,083	779	34%
Age 60 to 64	1,607	1,622	3,093	3,595	1,973	122%
Age 65 to 69	1,692	1,501	2,091	3,466	1,965	131%
Age 70 to 74	1,327	1,468	1,510	2,751	1,283	87%
Age 75 to 79	989	1,421	1,288	1,711	290	20%
Age 80 to 84	673	1,022	1,135	1,133	111	11%
Age 85 and over	616	929	1,358	1,484	555	60%
Total Population	55,742	60,057	63,858	67,023	6,966	12%
Total age 5 to 17	8,021	8,539	7,918	7,775	-764	-9%
share age 5 to 17	14.4%	14.2%	12.4%	11.6%		

	1990-2000	2000-2010	2010-2020
Population Change	4,315	3,801	3,165
Percent	8%	6%	5%
Average Annual	0.7%	0.6%	0.5%

Source: U.S. Census Bureau, 1990 and 2000 Censuses; data aggregated to CSD boundary by Portland State University Population Research Center. PSU-PRC Forecasts, 2010 and 2020.
*Note: 2010 Census population was not available at the time that the forecasts were completed.

District-wide Enrollment Forecast

Chart 3 compares the historic and forecast number of births in the District with the historic and forecast number of CSD kindergarten students. Births correspond to kindergarten cohorts (September to August). Not all District residents attend CSD kindergartens; therefore kindergarten enrollment is lower than the corresponding birth totals. Many children move into and out of the District between birth and age five, accounting for some of the variation in the relationship between births and enrollment. In general, the gap between births and kindergarten has been narrower in the past few years than in previous years. This could be attributable to higher net migration of young children, increasing capture rates, or some combination of the two factors. Kindergarten and first grade capture rates are shown in Table 12. The consistently higher rates for first grade reflect the fact that additional residents enter CSD schools after completing their kindergarten year in private schools.

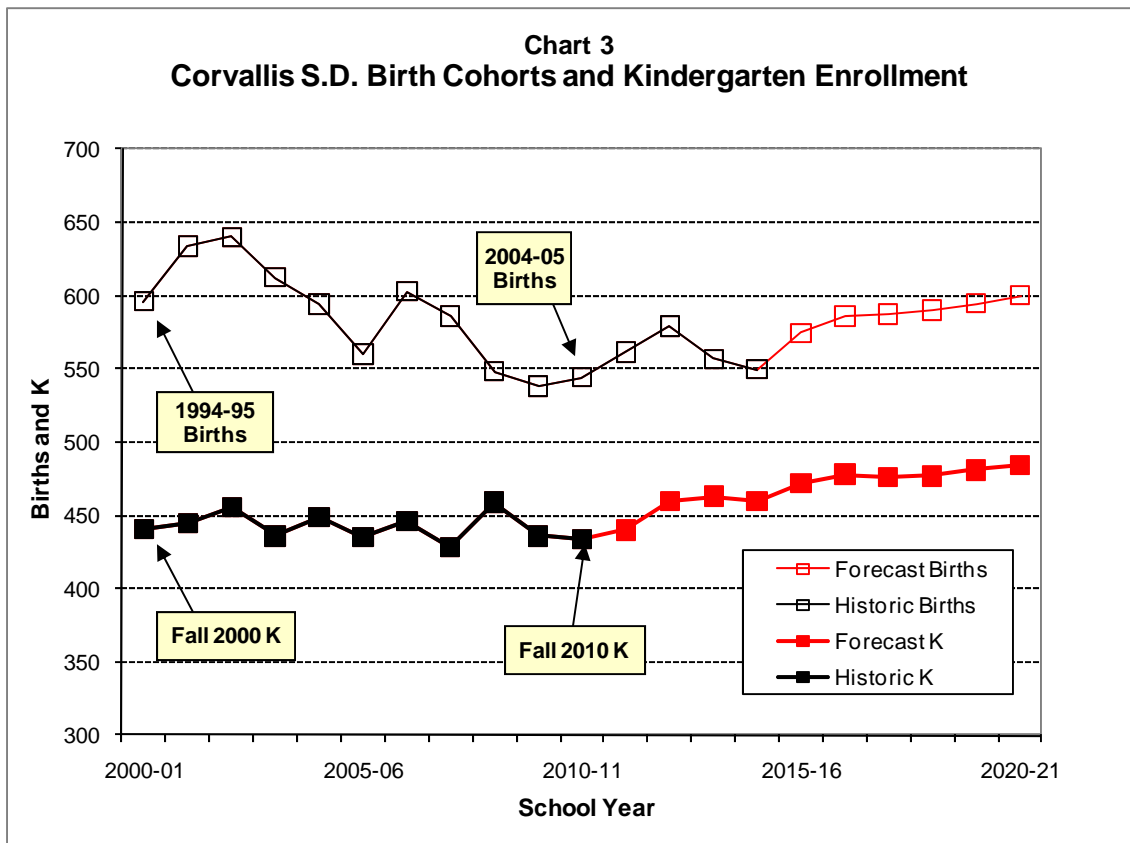


Table 12
Estimated and Forecast Capture Rates*
Corvallis School District

School Year	Kindergarten	Grade 1
1989-1990 (census)	0.85	0.92
1999-2000 (census)	0.78	0.80
2010-2011 (estimate)	0.82	0.86
2020-2021 (forecast)	0.81	0.84

**The ratio of enrollment in District schools to total population in the District.*

Although total K-12 enrollment has been falling, an analysis of individual grade cohorts reveals that the District typically does *not* lose students due to net migration. During the last five years, average GPRs for each grade from 2nd to 8th have ranged from 1.00 to 1.03, indicating stability or growth attributable to migration of school-age children. That includes 2009-10 and 2010-11, when there was a small net loss each year due to net migration at the elementary level. Table 13 shows these historic rates and the average rates based on the 10 year forecast.

Table 13
Average Grade Progression Rates*
CSD, Historic and Forecast

Grade Transition	Historic 2005-06 to 2010-11	Forecast 2010-11 to 2020-21
K-1	1.07	1.06
1-2	1.00	1.01
2-3	1.03	1.01
3-4	1.00	1.01
4-5	1.00	1.00
5-6	1.02	1.00
6-7	1.01	1.00
7-8	1.02	1.01
8-9	1.26	1.27
9-10	0.91	0.93
10-11	0.92	0.92
11-12	0.97	0.98

**Ratio of enrollment in an individual grade to enrollment in the previous grade the previous year. The figures are averages for each period.*

The impact of potential housing growth is not modeled explicitly in these enrollment forecasts. New housing is expected to generate enrollment growth, but that growth often falls short of expectations. Residential development within the District could cause enrollment to increase, particularly if it is suitable for families and affordable. However, demographic changes in the District's existing stock of about 27,000 housing units may have a greater influence on enrollment change than incremental growth of new housing. The aging of families in established homes, described in the "Housing and Enrollment" section, may cause enrollment declines that counteract the gains from new housing. The assumption is that housing production will recover to long term historic averages, contributing to a small positive net migration of families with children into the District.

Table 14 contains grade level forecasts for the Corvallis School District for each year from 2011-12 to 2020-21. The forecasts are also summarized by grade level groups (K-5, 6-8, and 9-12). In the next five years, total K-12 enrollment is forecast to be relatively stable. Elementary enrollments begin to grow by 2013 due to larger incoming kindergarten classes and a recovery from the recessionary job and housing markets. Over the 10 year forecast period, K-12 enrollment is forecast to increase by 297 students (five percent), reversing the 851 student (12 percent) decline experienced in the past 10 years. Most of the growth occurs at the elementary level; grades K-5 enrollment is forecast to increase by 271 students, grades 6-8 enrollment is forecast to increase by 52 students, and grades 9-12 enrollment is forecast to decrease by 26 students between Fall 2010 and Fall 2020.

There will be annual fluctuations that no forecast can anticipate; a one or two year deviation from the forecast does not mean that the forecast trend will be inaccurate in the long run. However, if incoming kindergarten classes in the next few years are significantly lower than forecast, overall K-12 enrollment may fall short of the forecast over the long run.

**Table 14
Corvallis School District, Enrollment Forecasts, 2011-12 to 2020-21**

Grade	Actual	Forecast									
	2010-11	2011-12	2012-13	2013-14	2014-15	2015-16	2016-17	2017-18	2018-19	2019-20	2020-21
K	434	440	460	463	460	472	478	476	477	481	484
1	465	458	463	488	492	488	501	507	505	506	509
2	472	467	463	471	496	500	496	509	515	513	513
3	469	474	470	468	477	501	505	501	515	521	518
4	486	470	477	475	473	482	506	510	506	520	525
5	473	486	470	478	476	474	483	507	511	507	521
6	478	473	486	470	478	476	474	483	507	511	507
7	473	478	474	487	471	479	477	475	484	508	512
8	528	474	481	479	492	476	484	482	479	488	512
9	672	663	598	611	608	624	603	614	611	607	617
10	587	620	613	555	567	563	578	559	569	566	562
11	479	540	571	565	512	523	519	533	515	525	522
12	504	470	530	561	555	503	514	510	523	506	515
Total	6,520	6,513	6,556	6,571	6,557	6,561	6,618	6,666	6,717	6,759	6,817
<i>Annual change</i>		-7	43	15	-14	4	57	48	51	42	58
		-0.1%	0.7%	0.2%	-0.2%	0.1%	0.9%	0.7%	0.8%	0.6%	0.9%
K-5	2,799	2,795	2,803	2,843	2,874	2,917	2,969	3,010	3,029	3,048	3,070
6-8	1,479	1,425	1,441	1,436	1,441	1,431	1,435	1,440	1,470	1,507	1,531
9-12	2,242	2,293	2,312	2,292	2,242	2,213	2,214	2,216	2,218	2,204	2,216

	5 Year Change: 2010-11 to 2015-16		5 Year Change: 2015-16 to 2020-21		10 Year Change: 2010-11 to 2020-21	
	Growth	Pct.	Growth	Pct.	Growth	Pct.
K-5	118	4%	153	5%	271	10%
6-8	-48	-3%	100	7%	52	4%
9-12	-29	-1%	3	0%	-26	-1%
Total	41	1%	256	4%	297	5%

*Note: Includes charter schools, but does not include special programs (e.g. YES House)
Population Research Center, Portland State University, December 2010*

Individual School Forecasts

Forecasts for individual schools are prepared under a scenario in which current boundaries and grade configurations remain constant. Of course, school districts typically respond to enrollment change in various ways that might alter the status quo, such as attendance area boundary changes, opening or closing schools, or offering special programs. However, the individual school forecasts depict what future enrollments might be if today's facilities and boundaries were unchanged.

The methodology for the individual school forecasts relies on unique sets of grade progression rates for each school, and the ratio of kindergarten enrollment to lagged births within the school's attendance area. New kindergarten classes were forecast each year based on recent trends and birth cohorts within elementary attendance areas. Subsequent grades were forecast using GPRs based initially on recent rates and adjusted based on expected levels of housing growth. The final forecasts for individual schools are controlled to match the district-wide forecasts.

If new residential development is concentrated in specific attendance areas, it can have a greater relative impact on enrollment at individual schools than on the District overall. Elementary schools, having smaller attendance areas and more grades than middle or high schools, may notice the largest impact from new subdivisions or apartment complexes. The City of Corvallis' Land Development Report and more recent information provided by the City's Planning Division details the quantity and location of vacant residential land, including capacity in developments that have already been approved.⁸ This information, along with recent observed trends, guided the individual school forecasts.

Among the District's elementary attendance areas, the largest number of buildable lots is in the Adams area, which includes Coles Crossing, Brooklane Park Estates, and Megan's Addition. Homebuilding is currently occurring in each of those subdivisions. The next largest number of lots is in the Hoover area, which includes Meadowridge Phase 1 and current and future phases of Suncrest. Following Hoover is Wilson, which includes Seavey Meadows, where Willamette

⁸ City of Corvallis, Corvallis Land Development Information Report. August 2008. Additional geographic files

Neighborhood Housing Services plans to begin construction this spring.⁹ At build-out, Seavey Meadows will contain 43 units of affordable housing, mostly two and three bedroom units. Finally, the Lincoln attendance area includes the large Willamette Landing development. Willamette Landing is nearly built out, but construction is still ongoing on some of the remaining lots.

The District's middle schools and high schools cover wider geographic areas, and are relatively balanced between established residential areas, potential growth areas, city neighborhoods and rural areas. Their enrollments are influenced by the size of grade cohorts articulating from their respective feeder schools, so they vary from year to year based on the relative sizes of incoming and outgoing classes. These forecasts include slightly more growth for Cheldelin Middle School and Crescent Valley High School than for Linus Pauling Middle School and Corvallis High School.

Table 15 presents the enrollment forecasts for each school, grouped by school level (elementary, middle, and high).

⁹ Corvallis Gazette-Times, Monday December 6, 2010.

Table 15
Enrollment Forecasts for Individual Schools, 2011-12 to 2020-21

School	Actual 2010-11	Forecast										Change 2010-11- 2020-21
		2011-12	2012-13	2013-14	2014-15	2015-16	2016-17	2017-18	2018-19	2019-20	2020-21	
Adams	390	383	387	398	393	405	415	425	431	435	441	51
Franklin K-8	329	324	324	327	327	327	327	327	327	327	327	-2
Garfield	380	393	398	403	417	424	420	424	426	429	433	53
Hoover	419	428	425	446	441	443	463	470	471	473	476	57
Jefferson	329	323	325	333	328	331	338	345	348	350	353	24
Lincoln	325	318	318	320	329	338	340	343	345	349	350	25
Mountain View	344	334	322	310	322	319	331	333	337	339	342	-2
Wilson	369	372	382	385	396	409	414	422	423	425	427	58
Elementary Schools	2,885	2,875	2,881	2,922	2,953	2,996	3,048	3,089	3,108	3,127	3,149	264
Cheldelin M.S.	598	567	586	602	606	604	589	594	598	630	643	45
Linus Pauling M.S.	724	706	703	679	680	672	691	691	717	722	733	9
Middle Schools	1,322	1,273	1,289	1,281	1,286	1,276	1,280	1,285	1,315	1,352	1,376	54
Corvallis H.S.	1,154	1,155	1,169	1,181	1,154	1,133	1,122	1,116	1,095	1,115	1,127	-27
Crescent Valley H.S.	1,088	1,138	1,143	1,111	1,088	1,080	1,092	1,100	1,123	1,089	1,089	1
High Schools	2,242	2,293	2,312	2,292	2,242	2,213	2,214	2,216	2,218	2,204	2,216	-26
District-run Schools	6,449	6,441	6,482	6,495	6,481	6,485	6,542	6,590	6,641	6,683	6,741	292
Muddy Creek Charter	71	72	74	76	76	76	76	76	76	76	76	5
Grand Totals	6,520	6,513	6,556	6,571	6,557	6,561	6,618	6,666	6,717	6,759	6,817	297

Population Research Center, Portland State University, January 2011

FORECAST ERROR AND UNCERTAINTY

Forecasts should be understood to represent a range of outcomes even though discrete numbers are provided. In general, forecast error varies according to the size of the population being forecast and the length of the forecast horizon. The smaller the population and the longer the forecast period, the larger the error is likely to be. In particular, the school level forecasts depend on assumptions about the distribution of housing and population growth in small areas within the District over a 10 year period, so the error is likely greater than the District-wide forecast error. The forecasts should be used as only one of many tools in the planning process.

Due to the nature of forecasting, there is no way to estimate a confidence interval as one might for data collected from a survey. The best way to measure potential forecast error is to compare actual enrollments with previous forecasts that were conducted using similar data and methodologies. In Chart 4, historic CSD K-12 enrollment through Fall 2010 and the current forecasts are compared with the 2001-02 to 2015-16 forecasts that were prepared by PRC in 2001.

For the first five years of the 2001 forecast, K-12 enrollment tracked closely with the low series, one of three alternative forecast scenarios. In the five years since, K-12 enrollments have fluctuated between the low and medium series. Although the actual Fall 2010 grades 6-8 enrollment was only 14 students (one percent) lower than the medium forecast and grades 9-12 enrollment was 130 students (six percent) higher than the medium forecast, actual elementary grades K-5 enrollment fell 283 students (10 percent) short of the medium forecast. The shortfall at the early grades suggests that total K-12 enrollment likely will not increase between 2010 and 2015 to the extent predicted by the 2001 medium forecast.

Chart 4
CSD Historic and Forecast Enrollment

