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Longview Public Schools Enrollment Forecasts 2013-14 to 2022-23, 2027-28, and 2023-33

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LONGVIEW PUBLIC SCHOOLS

ENROLLMENT FORECASTS

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Prepared By

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EXECUTIVE SUMMARY

The Longview Public Schools (LPS) has been gradually losing K-12 enrollment for most years at least since 1998-99; in the past fourteen years, the District experienced a net decrease of over 1,000 students, around 14 percent of the District's enrollment. In Fall 2012, LPS enrolled 6,551 students, a decrease of 110 students from the previous year. The decrease was within two percent of the Fall 2011 K-12 total. Between 2011-12 and 2012-13, elementary grades (K-5th) enrollment declined by 57 students (1.9 percent); middle school grades (6th-8th) declined by 37 students (2.4 percent), and high school grades (9th-12th) declined by 16 students (0.8 percent).

Migration is one of the key factors contributing to the District's decline in total enrollment over the years; there were consistently more households moving out than in. This migration pattern contributed to the modest growth in District births and subsequent kindergarten enrollments. The forecast includes slightly more enrollment growth due to migration than in the last few years, due to anticipated economic improvement and resumed demand for housing within the District.

The forecast indicates relatively stable enrollment at elementary, middle, and high school levels over the ten years horizon, and a modest decline in K-12 enrollment in the twenty years horizon. Enrollment at elementary levels is expected to see some short term growth between 2012-13 and 2017-18, followed by a decrease of about 50 students between 2017-18 and 2022-23. Middle school levels enrollment remain stable within the ten year forecast horizon, with slightly greater loss during the first half of the decade. High school enrollment is forecast to decrease between 2012-13 and 2018-19 and gradually increase until at least 2022-23, with an overall decline of 1 percent (28 students) during the ten year forecast period.

Overall K-12 enrollment growth of 10 students (zero percent) is forecast from 2012-13 to 2022-23 and a loss of 162 student (two percent) is forecast from 2012-13 to 2032-33. Chart 1 illustrates the District's annual K-12 growth trend for the past ten years and the ten year forecast horizon. Table 1 on the next page contains the LPS's recent and forecast enrollments by five year increments. The detailed annual enrollment forecast by grade level is provided in Table 16 on page 35.

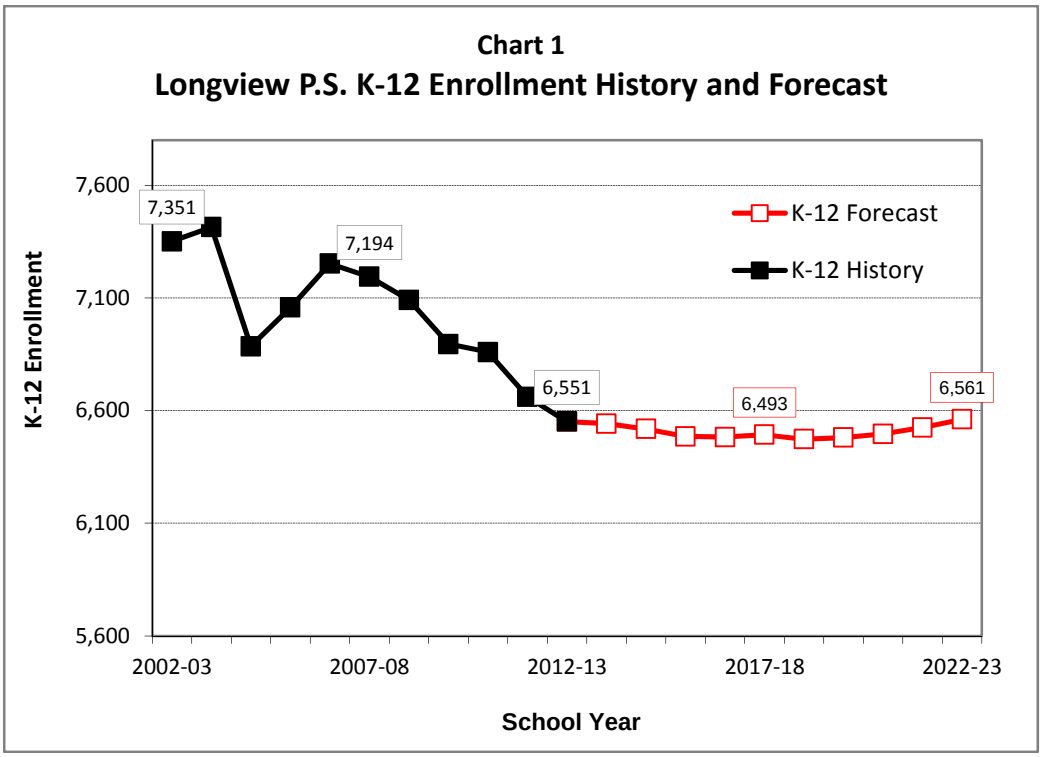
Chart 1
Longview P.S. K-12 Enrollment History and Forecast
K-12 Enrollment
7,600
7,100
6,600
6,100
5,600
7,351
7,194
6,551
6,493
6,561
K-12 Forecast
K-12 History
2002-03
2007-08
2012-13
2017-18
2022-23
School Year

Table 1

Historic and Forecast Enrollment
Longview Public Schools

	Historic		Forecast	
	2007-08	**2012-13**	**2017-18**	**2022-23**
District Total	7,194	6,551	6,493	6,561
5 year change		*-643*	*-58*	*68*
		-9%	*-1%*	*1%*
K-5	3,258	2,993	3,097	3,044
5 year change		*-265*	*104*	*-53*
		-8%	*3%*	*-2%*
6-8	1,648	1,488	1,476	1,475
5 year change		*-160*	*-12*	*-1*
		-10%	*-1%*	*0%*
9-12	2,288	2,070	1,920	2,042
5 year change		*-218*	*-150*	*122*
		-10%	*-7%*	*6%*

Population Research Center, PSU. August 2013.

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INTRODUCTION

The Longview Public Schools (LPS) requested that the Portland State University Population Research Center (PRC) prepare enrollment forecasts for use in the District's long-range planning. The current study integrates information about LPS, providing a snapshot of demographic, housing, and school enrollment patterns and trends. This report also presents an extended district-wide enrollment forecasts for each of the ten year period from 2013-14 to 2022-23 and for five year increments beyond the first decade for 2027-28 and 2032-33.

In the next few sections, overviews of the local area population, housing and economic trends, and LPS enrollment history will be presented. Next, the methodology for the district-wide enrollment forecasts will be described; followed by the results of the ten year district-wide forecasts with a forecast horizon between 2013-14 and 2022-23 and a district-wide forecast for the fifteen (2027-28) and twentieth (2032-33) year time points. The final section contains a brief discussion of the nature and accuracy of forecasts. An appendix contains a one page census profile for the District.

The District serves the City of Longview in Cowlitz County, WA as well as unincorporated areas surrounding the City of Longview, roughly approximate to the area service by the zip code 98632. The City of Longview accounted for 80.7 percent of the district's population in 2010. The District is located entirely within Cowlitz County.

A wide range of information specific to the district and its surrounding area was gathered for use in this demographic study. Data sources include: enrollment information from the LPS, Washington Office of Superintendent of Public Instruction, National Center for Education Statistics, demographic and housing data from the U.S. Census Bureau, birth data from the Washington State Department of Health Center for Health Statistics, county and state population estimates and forecast produced by Office of Financial Management, and employment pattern from the U.S. Census Center for Economic Studies.

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POPULATION, HOUSING, AND EMPLOYMENT TRENDS

During the decade between 2000 and 2010, total population within the LPS grew by 0.4 percent, from 43,602 persons to 45,370. The LPS's share of County population has decreased from 47 percent in 2000 to 44 percent in 2010. The incorporated city of Longview now contain about 79.5 percent of the District's population in the 2000, and city of Longview's share of the District's population increased slightly to 80.8 percent in 2010 with only about 20 percent of District residents live in unincorporated Cowlitz County. Table 2 shows that average annual growth rates for the City of Longview and the Cowlitz County between 2010 and 2013 were lower than in the 2000s. The District's average annual numeric growth of 177 persons between 2000 and 2010 was 65 percent lower than the average annual numeric growth of 513 persons between 1990 and 2000.

Table 2
City, County, and LPS Population

				Avg. Annual Growth Rate	
	2000	**2010**	**2013**	**2000-2010**	**2010-2013**
LPS Total*	43,602	45,370	N/A	*0.4%*	--
City of Longview	*34,660*	*36,648*	*36,940*	*0.6%*	*0.3%*
LPS Unincorporated	*8,942*	*8,722*	N/A	*-0.2%*	--
Cowlitz County	92,948	102,410	103,300	*1.0%*	*0.3%*

**Note: District population determined by PSU-PRC based on aggregation of census blocks within the LPS boundary shapefiles. The 2010 LPS population published by the Census Bureau is 45,370.*

Sources: U.S. Census Bureau, 2000 and 2010 censuses aggregated to LPS boundary by PSU Population Research Center; State of Washington Office of Financial Management, April 1, 2013 estimates.

Employment

Although about 33 percent of the District's resident worked over 50 miles away from their home possibly to larger job markets, the biggest employment destination for Longview area residents is within Cowlitz County. Based on 2011 data from firms covered by unemployment insurance (excluding most agricultural jobs and self-employment), 50 percent of LPS residents worked within Cowlitz County, including 38 percent within LPS and 35 percent within the City of

Longview. About seven percent of LPS residents worked in Clark County. Table 3 reports the number and share of workers by place of work.[1]

Table 3
Where LPS Residents Are Employed

Job Located Within*	Workers	Share
Cowlitz County, WA	10,015	*50%*
Longview Public Schools	7,624	*38%*
City of Longview	7,036	*35%*
King County, WA	1,562	*8%*
Clark County, WA	1,323	*7%*
Pierce County, WA	818	*4%*
Multnomah County, OR	733	*4%*
All other locations	5,463	*27%*
Total Primary Jobs	**19,914**	***100%***

**Note: Indentation indicates that the area is also included wihin the area above it. For example, workers in the City of Longview are also counted in the Longview Public Schools.*

Source: US Census Bureau, LED Origin-Destination Data Base (2011). Jobs covered by unemployment insurance, generally excluding federal government, agricultural, self-employed and domestic workers. Includes at most one (primary) job per resident.

On the other hand, about 85 percent of the workers employed within LPS area resided less than 50 miles from their home. About 68 percent of the workers working within LPS area live in Cowlitz County, roughly 29 percent reside within City of Longview. About seven percent of LPS workers resided in Clark County and four percent LPS workers resided in Columbia County. Table 4 summarizes the number and share of LPS area workers by location of the residence.

[1] U.S. Census Bureau, LED Origin-Destination Database (2nd quarter 2011). Commute shed report for residents of Longview Public Schools. Includes workers at firms covered by unemployment insurance (excludes most agricultural jobs and self-employment). http://lehd.did.census.gov/led/.

Table 4
Where Workers Who Worked in LPS Resided

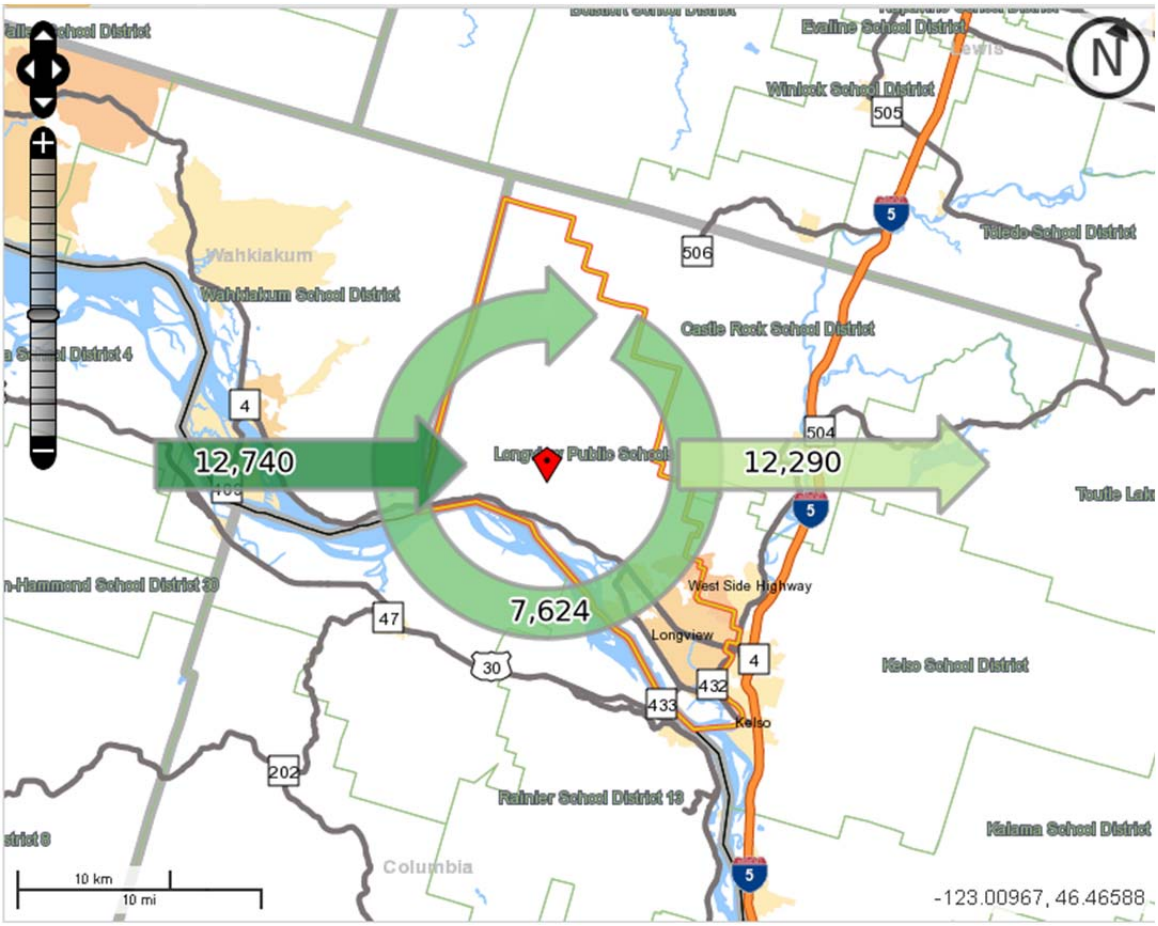
Home Located Within*	Workers	Share
Cowlitz County, WA	13,782	*68%*
Longview Public Schools	7,624	*37%*
City of Longview	5,884	*29%*
Clark County, WA	1,518	*7%*
Columbia County, OR	841	*4%*
Lewis County, WA	743	*4%*
King County, WA	447	*2%*
All other locations	3,033	*15%*
Total Primary Jobs	**20,364**	***100%***

**Note: Indentation indicates that the area is also included wihin the area above it. For example, residents in the City of Longview who worked in LPS are also counted in the Longview Public Schools.*

Source: US Census Bureau, LED Origin-Destination Data Base (2011). Jobs covered by unemployment insurance, generally excluding federal government, agricultural, self-employed and domestic workers. Includes at most one (primary) job per resident.

The number of people who lived and employed within Longview Public Schools area in 2011 was 7,624. There is a balance in the job inflow and outflow for the LPS area: the number of people who lived in the LPS area but employed outside was 12,290 while the number of people who lived outside of the LPS area and were employed within LPS was 12,740. Figure 1 provides a graphic illustration for the jobs inflow and outflow patter for LPS, the directions of the arrows do not indicate the direction of the job flow.

Figure 1. Jobs Inflow and Outflow in 2011, Longview Public Schools Area



Cowlitz County's unemployment rates were consistently higher than the rates for Washington State and the U.S. The unemployment rate for Cowlitz County rose from 6.3 percent in 2007, slightly higher than the State and U.S. rate of 4.6 percent, to 13.4 percent in 2009. The most recent annual Cowlitz County rate of 10.9 percent in 2012 was still above the State's 8.2 percent and the nation's 8.1 percent rate. Although the unemployment rate has dropped since 2009, Colitz County, State of Washington, and the U.S. rates all remained higher than the pre-recession levels.[2]

[2] Local Area Unemployment Statistics, Bureau of Labor Statistics, U.S. Department of Labor.

Housing Growth

The 2010 Census data showed that the number of housing units within the LPS increased by 1,207 (6 percent) between 2000 and 2010. The numeric increase was less than half the magnitude of the 2,608 unit increase in the 1990s. The number of households (occupied housing units) increased at a slower rate in the 1990s, so vacancy rates increased. But in the 2000s, the number of households increased at a slightly faster rate than the housing unit growth, thus yielding a lower vacancy rate. Table 4 presents housing and household characteristics for LPS compiled from the decennial censuses of 1990, 2000, and 2010.

Table 5
Longview Public Schools
Housing Units, 1990, 2000, and 2010

	1990	2000	2010
Housing Units	16,103	18,711	19,918
10 year change		*2,608*	*1,207*
		16%	*6%*
Occupied Housing Units	15,406	17,386	18,597
10 year change		*1,980*	*1,211*
		13%	*7%*
Vacant Housing Units	697	1,325	1,321
Vacancy rate	*4.3%*	*7.1%*	*6.6%*

Source: U.S. Census Bureau, 1990, 2000, and 2010 Censuses; National Center for Education Statistics; data aggregated to LPS boundary by Population Research Center, PSU.

Table 6 presents a summary of the demographic and housing information from the 2010 Census for the District's area. While the District gained 3,736 persons (increased by 8.6 percent) in the 2000s, there was a loss of 912 children ages 5-17 years (decreased by 10.8 percent). The number of children under 5 years old increased slightly by 39 persons (increased by 1.3 percent) over the 2000s. With a general decrease in population under 18 years old, there was also a decrease in number of households with children between 2000 and 2010. The average

household size also decreased from 2.46 persons per household in 2000 to 2.39 persons per household in 2010. Another notable change in demographic and household characteristic in the 2000s was an increase of 1,102 renter-occupied housing units (16.4 percent increase in 2010 compared with 2000). Despite an increase in both owner-occupied and renter-occupied housing units between 2000 and 2010, the growth in renter occupied units (1,102 units) accounted for 91 percent of the total occupied housing unit growth (1,211).

Table 6

Longview Public Schools

Population, Households, and Housing Units Characteristics, 2000 and 2010 Census

Population	**2000**	**2010**
Total Population	43602	47338
Age 5-17	8448	7536
< Age 5	3021	3060
Households		
Total Households	17386	18597
With Children < Age 18	5980	4901
Share of HHs with persons < Age 18	34.4%	26.4%
Population in Households	42741	44401
Persons per Household	2.46	2.39
Housing Units		
Total Housing Units	18711	19918
Occupied	17386	18597
Vacant	1325	1321
Vacancy Rate	7.1%	6.6%
Owner Occupied	10663	10772
Renter Occupied	6723	7825
Percent Owner Occupied	61.3%	57.9%

Source: 2000 and 2010 Census, Summary File 1, census block data aggregated to approximate LPS attendance areas by PSU, Population Research Center.

Residential building permit activity within the City of Longview in each of the past 17 years is presented in Table 7. Between 1997 and 2002, the housing development pace was relatively rapid, with an average of 183 housing units added each year for Longview. In the period between 2007 and 2012, the average annual added housing units dropped to 32 units per year. The decline in housing development correlates with the economic downturn, but activity may be increasing compared to the period between 2010 and 2012 where about 13 units were permitted per year. In the first six months of 2013, the City of Longview issued 11 permits for new single family homes. [3]

[3] U.S. Census Bureau, Residential Construction Branch. Data available for selected counties and cities at http://censtats.census.gov/bldg/bldgprmt.shtml.

Table 7
Housing Units Authorized by Building Permits
City of Longview

	City of Longview	
Year Permit Issued	Single Family	Multiple Family
1996	49	26
1997	53	50
1998	60	78
1999	125	40
2000	98	157
2001	102	119
2002	115	101
2003	58	22
2004	38	26
2005	63	2
2006	77	47
2007	68	8
2008	45	6
2009	18	0
2010	11	12
2011	13	0
2012	15	0
2013 (Jan-June)	11	0

Source: U.S. Census Bureau, Residential Construction Branch. Data available online at http://censtats.census.gov/bldg/bldgprmt.shtml.

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ENROLLMENT TRENDS

The Longview Public Schools (LPS) has been gradually losing K-12 enrollment for most years at least since 1998-99; in the past fourteen years, the District experienced a net decrease of over 1,000 students, around 14 percent of the District's enrollment. In Fall 2012, LPS enrolled 6,551 students, a decrease of 110 students from the previous year. The decrease was within two percent of the Fall 2011 K-12 total. Between 2011-12 and 2012-13, elementary grades (K-5th) enrollment declined by 57 students (1.9 percent); middle school grades (6th-8th) declined by 37 students (2.4 percent), and high school grades (9th-12th) declined by 16 students (0.8 percent).

Despite a general declining trend, the District's K-12 enrollment peaked at 7,252 most recently six years ago, in 2006-07. In 2012-13 enrollment was about 700 students lower than the peak. The decline has occurred at all levels but mostly at the middle and high school levels, which lost 431 students (21.9 percent) in the six year period. Over the past ten years between 2002-03 and 2012-13, the District lost 800 students (11 percent). During the past decade, the decline in enrollment was biggest for elementary and middle school grades with a loss of 342 (10 percent) and 297 (17 percent) students, respectively. The high school level enrollment declined by 161 students (7 percent) in the past ten years, with the decline mostly occurring in the latter half of the decade.

Table 8 summarizes the enrollment history for the District by grade level annually from 2002-03 to 2012-13.

Table 8

Longview Public Schools, Enrollment History, 2002-03 to 2012-13

Grade	2002-03	2003-04	2004-05	2005-06	2006-07	2007-08	2008-09	2009-10	2010-11	2011-12	2012-13
K	482	537	509	523	553	531	501	493	521	549	500
1	550	525	553	516	570	575	537	520	505	544	547
2	586	541	502	517	544	568	564	516	507	462	516
3	547	605	528	496	537	545	544	541	524	497	468
4	565	537	577	515	538	519	529	529	528	491	483
5	605	562	215	586	521	520	524	514	533	507	479
6	596	631	570	539	577	522	508	518	519	523	495
7	620	605	616	515	561	582	540	501	530	496	520
8	569	598	580	611	549	544	569	517	504	506	473
9	720	631	605	623	632	544	555	565	530	511	501
10	593	542	650	571	641	630	543	543	546	510	502
11	514	705	579	630	602	631	753	655	690	664	606
12	404	395	401	416	427	483	424	483	423	401	461
Total	**7,351**	**7,414**	**6,885**	**7,058**	**7,252**	**7,194**	**7,091**	**6,895**	**6,860**	**6,661**	**6,551**
Annual change		*63* *0.9%*	*-529* *-7.1%*	*173* *2.5%*	*194* *2.7%*	*-58* *-0.8%*	*-103* *-1.4%*	*-196* *-2.8%*	*-35* *-0.5%*	*-199* *-2.9%*	*-110* *-1.7%*
K-5	3,335	3,307	2,884	3,153	3,263	3,258	3,199	3,113	3,122	3,050	2,993
6-8	1,785	1,834	1,766	1,665	1,687	1,648	1,617	1,536	1,553	1,525	1,488
9-12	2,231	2,273	2,235	2,240	2,302	2,288	2,275	2,246	2,185	2,086	2,070

	5 Year Change: 2002-03 to 2007-08		5 Year Change: 2007-08 to 2012-13		10 Year Change: 2002-03 to 2012-13	
	Change	**Pct.**	**Change**	**Pct.**	**Change**	**Pct.**
K-5	-77	*-2%*	-265	*-8%*	-342	*-10%*
6-8	-137	*-8%*	-160	*-10%*	-297	*-17%*
9-12	57	*3%*	-218	*-10%*	-161	*-7%*
Total	**-157**	***-2%***	**-643**	***-9%***	**-800**	***-11%***

Sources: National Center for Education Statistics; Office of Superintendent of Public Instruction; LPS

Private School Enrollment

Private schools within the LPS enroll local students as well as students from beyond the LPS boundaries. Conversely, LPS residents attend private schools beyond the District's boundary, so 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). The 2010 Census did not include socio-economic variables as the Census long form has been replaced by the ACS, which samples a small number of households to provide data annually. Table 9 shows that in 2000, about 540 residents in 1st-12th grade were enrolled in private schools, a 6.7 percent share. According to the 2009-2011 ACS, about 8.8 percent of 1st-12th grade LPS residents attend private schools[4]; however, the ACS has a smaller sample size than the census long form, with larger margins of error, but the higher share of residents enrolled in private schools was not significantly different than the 2000 estimate considering the margin of error in the ACS sample.

[4] U.S. Census Bureau, 2000 Census, Summary File 3, Table P36; U.S. Census Bureau 2009-2011 American Community Survey 3 year estimates, Table C14002.

Table 9

School Enrollment by Type of School

Residents of Longview Public Schools

Census Data, 2000 & 2009-2011

	2000	2009-11	
		estimate	MOE*
Enrolled in 1st-12th grade	8,089	6,609	*+/-687*
Public Schools	7,550	6,027	*+/-680*
Private Schools	539	582	*+/-219*
Private Share	*6.7%*	*8.8%*	*+/- 3.4%*
Enrolled in 1st-8th grade	5,386	4,423	*+/-535*
Public Schools	4,952	4,006	*+/-548*
Private Schools	434	417	*+/-175*
Private Share	*8.1%*	*9.4%*	*+/- 4.1%*
Enrolled in 9th-12th grade	2,703	2,186	*+/-430*
Public Schools	2,598	2,021	*+/-402*
Private Schools	105	165	*+/-131*
Private Share	*3.9%*	*7.5%*	*+/- 6.2%*

**Margin of sampling error at the 90 percent confidence level.*

Sources: 2000 Census, Summary File 3, Table P36 (LPS area estimated by PRC); 2009-2011 American Community Survey, Table C14002 (tabulated for LPS area by Census Bureau).

Inter-District Transfers

In each of the past several years the LPS has had a net loss of students due to inter-district transfers, as there have been fewer students from other public school districts transferring into the District than District residents transferring out. The net impact of these transfers fluctuated only slightly between 2010-11 and 2011-12. In 2012-13, there was a net loss of 125 K-12 students through inter-district transfer, as shown in Table 8. This net loss of students in 2012-13 was most notable among elementary school grades (loss of 70 students, or 56 percent of the net loss) compared to the two previous years. Although slight increases in number of students transferring out of LPS were also noted, the magnitude of change was not as big as that observed in elementary grades.

Table 10

Inter-District Transfers

	Into LPS	Out of LPS	Net
2010-11			
K-5	96	98	-2
6-8	37	65	-28
9-12	88	96	-8
Net	**221**	**259**	**-38**
2011-12			
K-5	76	98	-22
6-8	30	59	-29
9-12	85	82	3
Net	**191**	**239**	**-48**
2012-13			
K-5	56	126	-70
6-8	23	57	-34
9-12	65	86	-21
Net	**144**	**269**	**-125**

Source: Longview Public Schools

Enrollment Trends at Individual Schools

Comparison of enrollment trends at individual school level can provide some insights to changes in enrollment within the District over time. However, the most informative comparison across time is dependent on the time period of comparison and whether there are changes with school attendance area boundaries, school program changes, and school enrollment policy changes. A time period with consistent boundaries, programs, and policies would allow for the most direct and meaningful comparison. Table 10 shows enrollment at each of the District's schools for each of the six school years beginning in 2007-08, and the final columns show the five year enrollment change for each school.

Elementary schools in LPS experienced a loss of 265 students since 2007-08, an eight percent decline in enrollment. Most of the District's elementary schools experienced enrollment losses between 2007-08 and 2012-13, with the exception of Columbia Heights and Columbia Valley Gardens. Among all the elementary schools, the biggest drop in enrollment was observed in Northlake Elementary, losing 91 students (20.6 percent drop) between 2007-08 and 2012-13. In Fall 2012, the total enrollments for elementary schools vary in a range between 309 and 497 students.

District-wide middle school enrollment experienced the greatest percentage change between 2007-08 and 2012-13 with a loss of 160 students (9.7 percent decline in enrollment). Monticello Middle had the greatest loss (89 students or 15.3 percent) during this period. In 2012-13, the middle school enrollments vary in a narrow range between 493 and 500. The two high schools in LPS experienced a decline of 218 students (9.5 percent) between 2007-08 and 2012-13. A more rapid drop in enrollment was seen in Robert A. Long High in the past five year with a decline of 161 students (14 percent).

Table 11

Enrollment History for Individual Schools, 2007-08 to 2012-13

School	2007-08	2008-09	2009-10	2010-11	2011-12	2012-13	Change 2007-08 to 2012-13 Number	Change 2007-08 to 2012-13 Percent
Columbia Heights Elementary	357	322	301	380	375	364	7	*2.0%*
Columbia Valley Gardens Elementary	382	367	389	409	419	390	8	*2.1%*
Kessler Elementary	388	379	370	320	313	336	-52	*-13.4%*
Mint Valley Elementary	429	494	461	450	414	417	-12	*-2.8%*
Northlake Elementary	441	381	375	343	329	350	-91	*-20.6%*
Olympic Elementary	339	368	334	320	325	309	-30	*-8.8%*
Robert Gray Elementary	574	545	525	549	547	497	-77	*-13.4%*
St. Helens Elementary	348	343	358	347	328	330	-18	*-5.2%*
Elementary Totals	**3,258**	**3,199**	**3,113**	**3,118**	**3,050**	**2,993**	**-265**	***-8.1%***
Cascade Middle	529	514	475	486	508	495	-34	*-6.4%*
Monticello Middle	582	565	532	525	506	493	-89	*-15.3%*
Mt. Solo Middle	537	538	529	542	511	500	-37	*-6.9%*
Middle School Totals	**1,648**	**1,617**	**1,536**	**1,553**	**1,525**	**1,488**	**-160**	***-9.7%***
Mark Morris High School	1,142	1,197	1,202	1,161	1,129	1,085	-57	*-5.0%*
Robert A. Long High School	1,146	1,078	1,044	1,028	957	985	-161	*-14.0%*
High School Totals	**2,288**	**2,275**	**2,246**	**2,189**	**2,086**	**2,070**	**-218**	***-9.5%***
District Totals	**7,194**	**7,091**	**6,895**	**6,860**	**6,661**	**6,551**	**-643**	***-8.9%***

Source: Longview Public Schools.

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ENROLLMENT FORECASTS

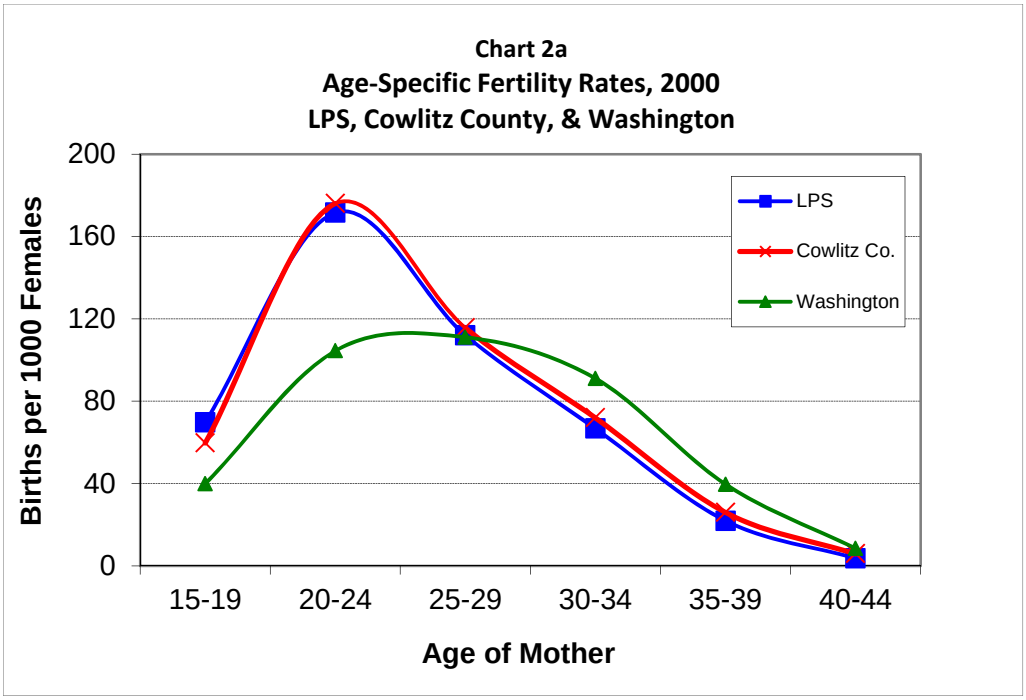
District-wide Long-range Forecast Methodology

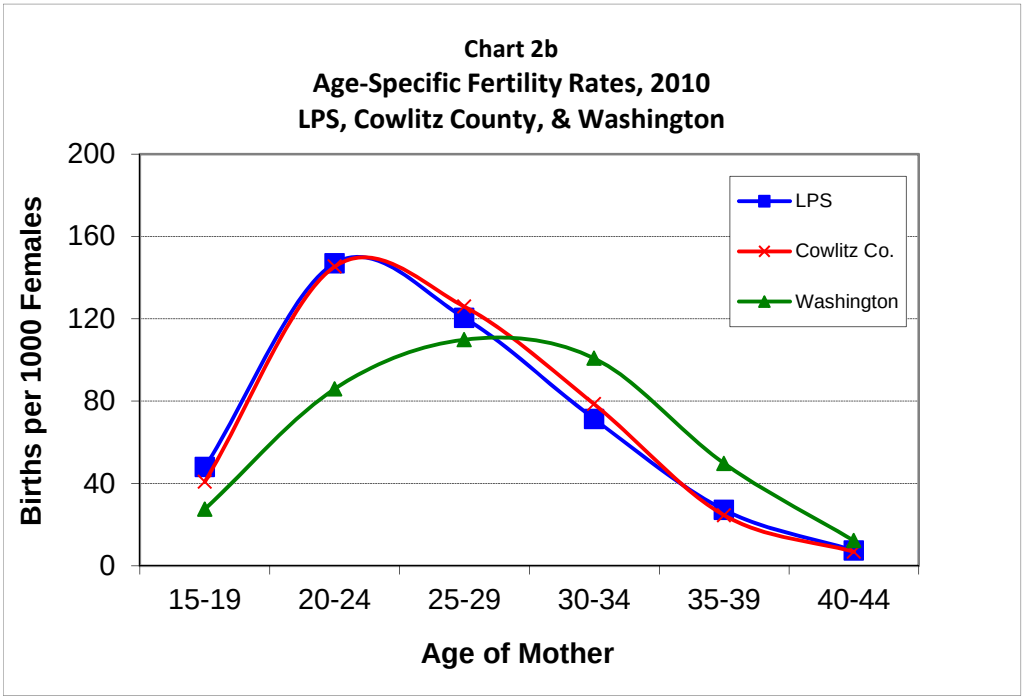
To ensure that enrollment forecasts are consistent with the dynamics of likely population growth within the District, we combine the grade progression enrollment model with a demographic cohort-component model used to forecast population for the District by age and sex. The components of population change 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 2000 and 2010 Census results were used as a baseline for the population forecasts. By "surviving" the 2000 population and 2000s births (estimating the population in each age group that would survive to the year 2010) and comparing the "survived" population to the actual 2010 population by age group, we were able to estimate the overall level of net migration between 2000 and 2010 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 2010 to 2030 period.

We estimated the number of births to women residing within the District each year from 2000 to 2010, using data from the Washington State Department of Health, Center for Health Statistics. Detailed information including the age of mothers is used to calculate fertility rates by age group for both 2000 and 2010.

The 2000 and 2010 age-specific fertility rates for the LPS, Cowlitz County, and the State of Washington are shown in Chart 2a & b. Age-specific fertility rates for women in LPS are similar to those of the County in both 2000 and 2010. However, there was a decrease in age-specific fertility rates for women under 25 years over the decade while an increase in age-specific fertility rates for women 25 years old or older. For both 2000 and 2010, the rates for women under 25 years old were higher for the LPS and Cowlitz County than for the State; the rates for women 25 years old or older were higher for the State than for the LPS and Cowlitz County.





The total fertility rate (TFR) is another measure for fertility; it is an estimate of the number of children that would be born to the average woman during her child-bearing years based on age-specific fertility rates observed at a given time. The estimated TFR for the District decreased from 2.23 in 2000 to 2.11 in 2010. Similarly, drops in TFRs were observed in Cowlitz County and

the State during the past decade. In 2000, the TFRs were 2.27 for Cowlitz County and 1.97 for the State; while in 2010, the TFRs were 2.11 for Cowlitz County and 1.93 for the State.

State and national long term trends indicate declining fertility rates for women under 30 and increasing rates for women 30 and over, but fertility rates in 2010 were unusually low due as a likely result of the poor economy. Birth totals fell more than eight percent in the U.S. and two percent in Washington between 2007 and 2011.[5] The Pew Research Center's analysis of multiple economic and demographic data sources confirms the close correlation between the economic downturn and the nation's decline in birth rates.[6] They report that 2011 birth rates are the lowest ever recorded, including plunges in the rates for foreign-born women (14 percent decline between 2007 and 2010), particularly Mexican immigrant women (23 percent decline).[7] Future trends in birth rates are uncertain. If couples have simply postponed having children due to the recession, rates may increase. However, Latino birth rates may continue to fall as a higher share of adult Latinos are native-U.S. born, with increasing educational attainment. In these forecasts, birth rates for all age groups 25 years or older increase slightly between 2010 and 2015, but remain relatively constant levels throughout the forecast horizon.

[5] Washington State Department of Health, Center for Health Statistics.

[6] "In a Down Economy, Fewer Births." Pew Research Center, Pew Social & Demographic Trends, October 2011.

[7] "U.S. Birth Rate Falls to a Record Low; Decline Is Greatest Among Immigrants." Pew Research Center, Pew Social & Demographic Trends, November 2012.

Table 12
Estimated and Forecast Births
Longview Public Schools

Year	Births
2000	618
2001	589
2002	596
2003	547
2004	571
2005	577
2006	615
2007	643
2008	624
2009	608
2010	551
2011	585
2012 (forecast)	580
2013 (forecast)	579
2014 (forecast)	578
2015 (forecast)	577
2016 (forecast)	575
2017 (forecast)	574

Source: 2000-2011 birth data from Washington State Department of Health allocated to LPS boundary. 2012-2017 forecasts, PSU-PRC.

Table 12 shows historic births from 2000 to 2011 as well as forecasts from 2012 until 2017, the period that will have an impact on the enrollment forecasts presented in this study. The number of births in LPS generally decreased between 2000 and 2003 and rebounded between 2004 and 2007; however, the number of births has fallen from its 2007 peak, coinciding with the economic downturn. However, births are forecast to remain relatively stable with slight decrease from 2012 to 2017, attributable mostly to overall aging population and modest population growth.

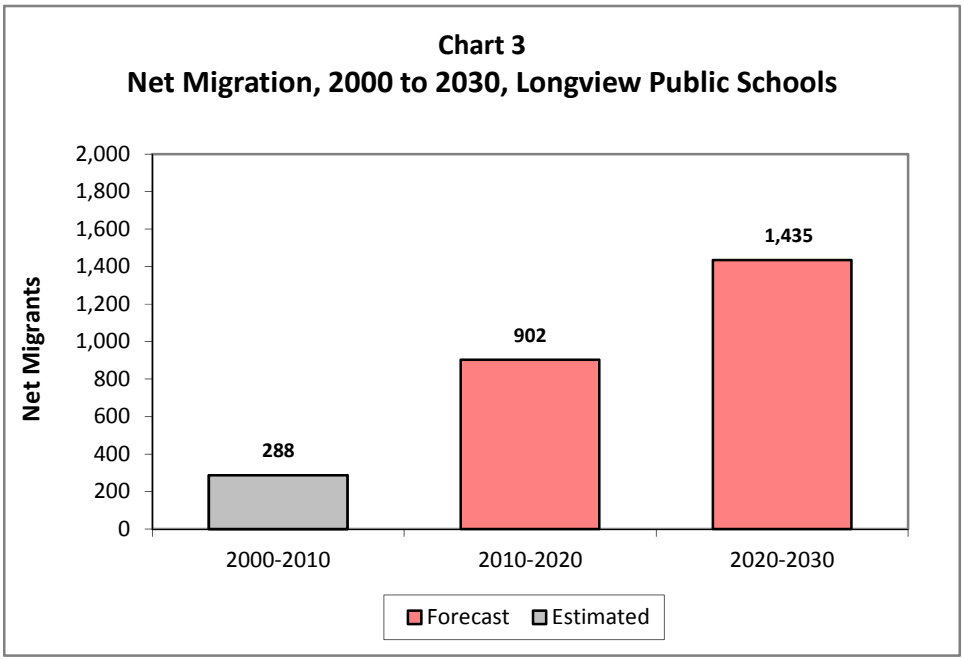
Historic school enrollment is linked to the population forecast in two ways. First, the kindergarten and first grade enrollments at the time of the most recent census (the 2009-10

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 LPS 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) is used to move students from one grade to the next. Grade progression rates are the ratio of enrollment in an individual grade to enrollment in the previous grade the previous year. Baseline 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

Census data shows that the District added about 3,300 fewer residents in the 2000s than in the 1990s. Most of the difference was due to a lower level of positive net migration (more people moving in than moving out). Natural increase (births minus deaths) has also contributed less to population growth since 2000 due to an aging population and lower fertility. Although slow growth has persisted in the first three years of this decade, growth due to net migration is forecast to be slightly higher in the 2010 to 2020 period than in the 2000 to 2010 period. Chart 3 shows the 2000 to 2010 estimates and 2010 to 2030 forecast of LPS population growth attributable to net migration.



The district-wide population by age group is presented in Table 13. The forecast for 2020 population in the LPS is 46,566, an increase of 1,196 persons from the 2010 Census (0.3 percent average annual growth). School-age population (5 to 17) is forecast to decline slightly, the forecast shows a 75 person (one percent) decline in school-age population between 2010 and 2020. The share of population age 5-17 is also expected to drop from 16.6 percent in 2010 to 16.0 percent in 2020. By 2020, the fastest growing age groups are the "baby boom" generation that will be in its 60s and 70s. Population age 55 and older in the District is forecast to account for all of the District's growth and compensating for the loss in younger population between 2010 and 2020.

Table 13

Population by Age Group, History and Forecast
Longview Public Schools, 2000 to 2030

	2000 Census	2010 Census	2020 Forecast	2030 Forecast	2010 to 2030 Change	
					Number	Percent
Under Age 5	3,021	3,060	2,876	2,827	-233	*-8%*
Age 5 to 9	3,291	2,889	2,884	2,842	-47	*-2%*
Age 10 to 14	3,228	2,879	2,939	2,764	-115	*-4%*
Age 15 to 17	1,929	1,768	1,638	1,628	-140	*-8%*
Age 18 to 19	1,189	1,194	969	976	-218	*-18%*
Age 20 to 24	2,653	2,817	2,571	2,658	-159	*-6%*
Age 25 to 29	2,695	2,748	2,790	2,457	-291	*-11%*
Age 30 to 34	2,822	2,628	2,847	2,598	-30	*-1%*
Age 35 to 39	3,071	2,567	2,672	2,797	230	*9%*
Age 40 to 44	3,281	2,641	2,512	2,721	80	*3%*
Age 45 to 49	3,203	2,967	2,481	2,596	-371	*-13%*
Age 50 to 54	2,993	3,353	2,702	2,606	-747	*-22%*
Age 55 to 59	2,250	3,227	2,988	2,547	-680	*-21%*
Age 60 to 64	1,717	2,984	3,343	2,750	-234	*-8%*
Age 65 to 69	1,475	2,156	3,030	2,849	693	*32%*
Age 70 to 74	1,432	1,583	2,634	2,984	1,401	*89%*
Age 75 to 79	1,342	1,321	1,839	2,559	1,238	*94%*
Age 80 to 84	1,012	1,177	1,282	2,055	878	*75%*
Age 85 and over	998	1,411	1,569	1,918	507	*36%*
Total Population	**43,602**	**45,370**	**46,566**	**47,132**	**1,762**	***4%***
Total age 5 to 17	8,448	7,536	7,461	7,234	-302	*-4%*
share age 5 to 17	*19.4%*	*16.6%*	*16.0%*	*15.3%*		

		2000-2010	2010-2020	2020-2030
Population Change		**1,768**	**1,196**	**567**
Percent		*4%*	*3%*	*1%*
Average Annual		*0.4%*	*0.3%*	*0.1%*

Source: U.S. Census Bureau, 2000 and 2010 Censuses; data aggregated to LPS boundary by Portland State University Population Research Center. PSU-PRC Forecasts, 2020 and 2030.

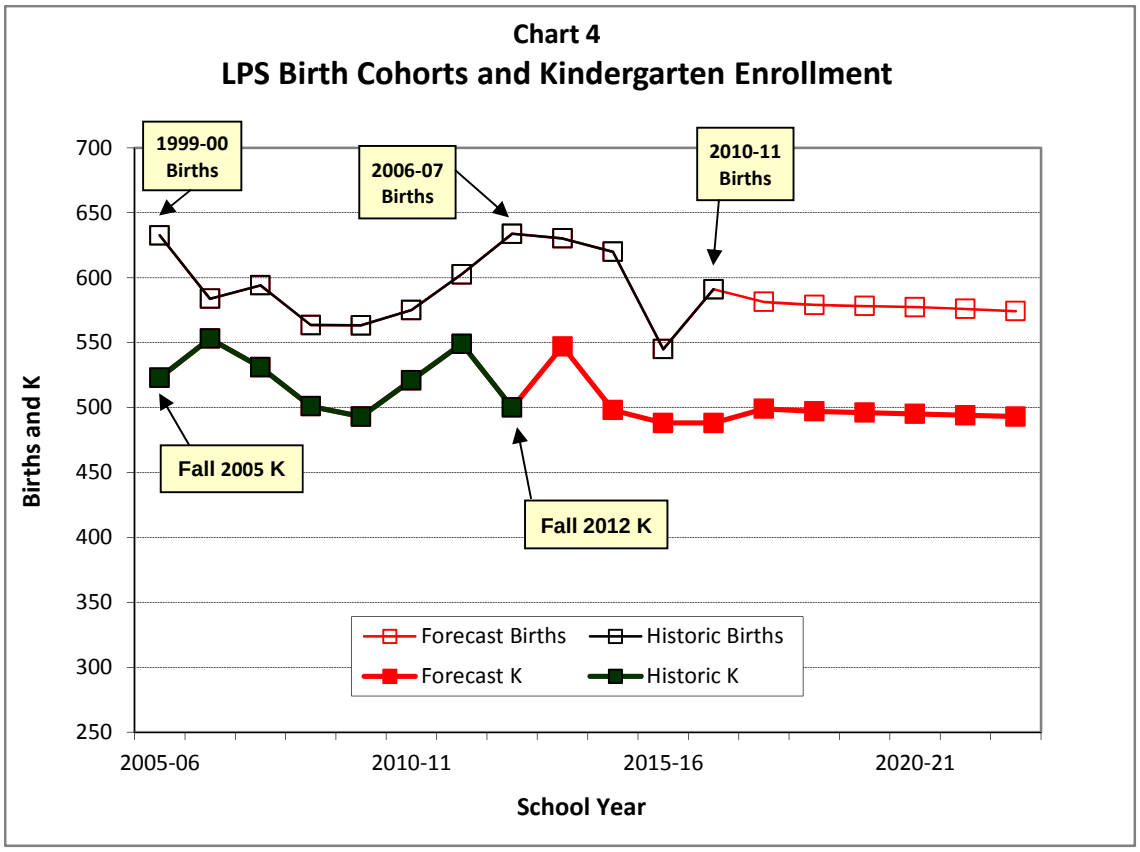
Population forecasts for the District are consistent with the county forecasts that were produced by the Washington State Office of Financial Management in 2012. The average annual growth rates for the District are less than the rates for the Cowlitz County, because there are other cities within the County that are expected to have more rapid population growth.

District-wide Enrollment Forecast

These enrollment forecasts rely primarily on input from three general sources of information: births, recent enrollment history, and assumptions about future migration. In the model used to produce the forecast, we base assumptions about future migration levels on recent migration trends and recent county and state forecasts.

Births to women residing within the specific boundaries of the District were estimated for the years 2000 to 2011, in a model that incorporates individual birth records summary, and zip code summaries. The births are grouped by kindergarten cohort (September to August). Kindergarten enrollment is affected by migration between birth and age five as well as the District's capture rate.

Chart 4 compares the historic and forecast number of births in the District with the historic and forecast number of LPS kindergarten students. The trend in births correspond to kindergarten cohorts (September to August) in general; however, external factors, such as migration of children into and out of the District between birth and age five and private school enrollment, can alter the correlations between lagged births and kindergarten enrollment. The gap between births and kindergarten enrollment has been pretty consistent in recent years, but the gap widened for fall 2012 compared to its lagged birth cohort, possibly as a consequence of lower net migration, declining capture rates, or some combination of the two factors.



Kindergarten and first grade capture rates are shown in Table 14. The higher rates for first grade reflect the fact that additional residents enter LPS schools after completing their kindergarten year in private schools.

Table 14
Estimated and Forecast Capture Rates*
Longview Public Schools

School Year	Kindergarten	Grade 1
1999-2000 (census)	0.82	0.90
2009-2010 (census)	0.86	0.91
2019-2020 (forecast)	0.85	0.89

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

A grade progression rate (GPR) is the ratio of enrollment in a specific grade in one year to the enrollment of the same age cohort in the previous year. For example, the number of students enrolled in second grade this year divided by the number of students enrolled in first grade last year. Rates for some grades may be consistently high, indicating that new students are entering the District from private schools. For this reason, it is common to see higher GPRs for the K-1st, 5th-6th and 8th-9th grade transitions. Generally, in grades 10, 11, or 12, low GPRs can indicate that students are dropping out of District schools or entering programs not counted in regular enrollment summaries. In the case of LPS, a higher GPR was observed for the transition of 10th-11th grade but a much lower GPR for the 11th-12th grade transition; this is due to students remain in Junior status without enough credits to be promoted to senior grade. For most elementary grades, if the population entering and leaving the District is in balance, one can expect GPRs very close to 1.00.

A net out-migration may also be a factor contributing to the District's decline in total enrollment over the years; there were consistently more households moving out than in. This migration pattern contributed to the modest growth in District births and subsequent kindergarten enrollments, as shown in Chart 4. Table 15 illustrates how the LPS lose students due to migration at most elementary grades. During the ten years between 2002-03 and 2012-13, average GPRs for elementary and middle school grades were mostly in the range between 0.93 and 1.00 except for K-1st and 5th-6th grade transitions, indicating shrinking enrollments due to out-migration. For the most recent three years, from 2009-10 to 2012-13, average elementary and middle grades GPRs range from 0.95 to 1.02, indicating little or no net change due to migration. The forecast includes slightly more enrollment growth due to migration than in the last few years, due to anticipated economic improvement and resumed demand for housing within the District.

Table 15
Grade Progression Rates[1]
Longview P.S. History and Forecast

Grade Transition	10 Year Average: 2002-03 to 2012-13	3 Year Average: 2009-10 to 2012-13	Baseline (without the influence of migration)	Forecast Average: 2012-13 to 2022-23
K-1	1.04	1.02	--[2]	1.05
1-2	0.97	0.95	1.00	0.99
2-3	1.00	1.00	1.00	0.99
3-4	0.98	0.96	1.00	0.99
4-5	0.93	0.98	1.00	0.99
5-6	1.15	0.99	1.00	0.99
6-7	0.99	0.99	1.01	1.00
7-8	0.98	0.97	1.00	0.99
8-9	1.03	1.01	1.01	1.00
9-10	0.96	0.97	0.98	0.97
10-11	1.13	1.23	1.20	1.19
11-12	0.68	0.64	0.70	0.70

1. Ratio of enrollment in an individual grade to enrollment in the previous grade the previous year.

2. The enrollment forecast model uses capture rates for first grade; K-1 baseline GPRs are not used.

The forecast indicates relatively stable enrollment at elementary, middle, and high school levels over the ten years horizon, and a modest decline in K-12 enrollment in the twenty years horizon. Enrollment at elementary levels is expected to see some short term growth between 2012-13 and 2017-18, followed by a decrease of about 50 students between 2017-18 and 2022-23. Middle school levels enrollment remain stable within the ten year forecast horizon, with slightly greater loss during the first half of the decade. High school enrollment is forecast to decrease between 2012-13 and 2018-19 and gradually increase until at least 2022-23, with an overall decline of 1 percent (28 students) during the ten year forecast period.

Table 16 contains grade level forecasts for the Longview Public Schools for each year from 2013-14 to 2022-23, and for 2027-28 and 2032-33. The forecasts are also summarized by grade level

groups (K-5, 6-8, and 9-12). Overall K-12 enrollment growth of 10 students (zero percent) is forecast from 2012-13 to 2022-23.

Table 16

Longview Public Schools, Enrollment Forecasts, 2013-14 to 2022-23, 2027-28, 2032-33

	Actual	Forecast											
Grade	**2012-13**	**2013-14**	**2014-15**	**2015-16**	**2016-17**	**2017-18**	**2018-19**	**2019-20**	**2020-21**	**2021-22**	**2022-23**	**2027-28**	**2032-33**
K	500	547	498	488	488	499	497	496	495	494	493	487	484
1	547	529	571	520	510	510	522	519	518	517	516	510	506
2	516	544	526	567	517	507	507	519	516	515	514	508	504
3	468	511	539	521	562	512	502	502	514	511	510	504	500
4	483	464	506	534	516	557	507	498	498	509	506	500	496
5	479	479	460	502	530	512	552	503	494	494	505	498	493
6	495	475	475	456	498	526	508	548	499	490	490	495	490
7	520	496	476	476	457	499	527	509	549	500	491	497	492
8	473	513	490	470	470	451	493	520	502	542	494	492	487
9	501	475	515	492	472	472	452	495	522	504	544	495	489
10	502	488	463	502	479	460	460	440	482	509	491	485	478
11	606	599	582	552	599	571	549	549	525	575	607	567	571
12	461	422	417	405	384	417	397	382	382	365	400	395	399
Total	**6,551**	**6,542**	**6,518**	**6,485**	**6,482**	**6,493**	**6,473**	**6,480**	**6,496**	**6,525**	**6,561**	**6,433**	**6,389**
Annual change or		*-9*	*-24*	*-33*	*-3*	*11*	*-20*	*7*	*16*	*29*	*36*	*-128***	*-44***
*** Five-yr change*		*-0.1%*	*-0.4%*	*-0.5%*	*0.0%*	*0.2%*	*-0.3%*	*0.1%*	*0.2%*	*0.4%*	*0.6%*	*-2.0%*	*-0.7%*
K-5	2,993	3,074	3,100	3,132	3,123	3,097	3,087	3,037	3,035	3,040	3,044	3,007	2,983
6-8	1,488	1,484	1,441	1,402	1,425	1,476	1,528	1,577	1,550	1,532	1,475	1,484	1,469
9-12	2,070	1,984	1,977	1,951	1,934	1,920	1,858	1,866	1,911	1,953	2,042	1,942	1,937

	5 Year Growth: 2012-13 to 2017-18		**5 Year Growth: 2017-18 to 2022-23**		**10 Year Growth: 2012-13 to 2022-23**		**20 Year Growth: 2012-13 to 2032-33**	
	Growth	**Pct.**	**Growth**	**Pct.**	**Growth**	**Pct.**	**Growth**	**Pct.**
K-5	104	*3%*	-53	*-2%*	51	*2%*	-10	*0%*
6-8	-12	*-1%*	-1	*0%*	-13	*-1%*	-19	*-1%*
9-12	-150	*-7%*	122	*6%*	-28	*-1%*	-133	*-6%*
Total	**-58**	***-1%***	**68**	***1%***	**10**	***0%***	**-162**	***-2%***

Population Research Center, Portland State University, August 2013

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FORECAST ERROR AND UNCERTAINTY

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 forecasts furthest away from the base year would have the greatest uncertainty due to less confidence in the assumptions about the economic condition, distribution of housing and population growth in the District over a 10 or 20 year period, so the error is likely greater than a short term 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. A regular assessment of the forecast and timely update using the most recent demographic, economic, and housing data would help ensure the incorporation of latest information in future enrollment forecast for planning purposes.

APPENDIX A

2000 AND 2010 CENSUS PROFILE FOR THE DISTRICT

2000 and 2010 Census Summary

Longview Public Schools

Area approximation based on census block geography

POPULATION BY AGE GROUP	2000		2010		2000 to 2010 Change	
Total population	43,602	*100.0%*	47,338	*100.0%*	3,736	*8.6%*
Under age 18	11,469	*26.3%*	10,596	*22.4%*	-873	*-7.6%*
Age 18 and over	32,133	*73.7%*	36,742	*77.6%*	4,609	*14.3%*
AREA AND DENSITY						
Land Area - Sq. Mi. (Source: 2010 Census)	129.6		129.6		0.0	*0.0%*
Persons per square mile	336.4		365.2		28.8	*8.6%*
HOUSING OCCUPANCY STATUS						
Total housing units	18,711	*100.0%*	19,918	*100.0%*	1,207	*6.5%*
Occupied	17,386	*92.9%*	18,597	*93.4%*	1,211	*7.0%*
Vacant or Seasonal	1,325	*7.1%*	1,321	*6.6%*	-4	*-0.3%*
HISPANIC OR LATINO AND RACE[1]						
Total population	43,602	*100.0%*	47,338	*100.0%*	3,736	*8.6%*
Hispanic or Latino (of any race)	2,238	*5.1%*	3,925	*8.3%*	1,687	*75.4%*
Not Hispanic or Latino	41,364	*94.9%*	41,445	*87.6%*	81	*0.2%*
White Alone	38,459	*88.2%*	38,062	*80.4%*	-397	*-1.0%*
Black or African American Alone	251	*0.6%*	328	*0.7%*	77	*30.7%*
American Indian and Alaska Native Alone	669	*1.5%*	655	*1.4%*	-14	*-2.1%*
Asian Alone	865	*2.0%*	884	*1.9%*	19	*2.2%*
Native Hawaiian and Other Pacific Islander Alone	60	*0.1%*	124	*0.3%*	64	*106.7%*
Some Other Race Alone	38	*0.1%*	34	*0.1%*	-4	*-10.5%*
Two or More Races	1,022	*2.3%*	1,358	*2.9%*	336	*32.9%*

1. Data are shown for the Hispanic or Latino population, as well as for people who reported one race and for people who reported two or more races. The population of One Race is the total of the population in the 6 categories of one race. The population of Two or More Races is the total of the population in the 57 specific combinations of two or more races. The redistricting files include data for all 63 groups.

Sources: U.S. Census Bureau, 2010 Census, Public Law 94-171 Summary File; 2000 Census, SF1.
Tabulated by Population Research Center, Portland State University. www.pdx.edu/prc