

# Mercer Island School District

## Demographic Trends and Enrollment Projections

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# Introduction

## Recent Trends in Enrollment

The present report provides an update of the enrollment forecasts completed for the Mercer Island School District in December 2008. Enrollment in Mercer Island is currently tracking above the medium range projection from 2008 by 152 students. Elementary enrollment in October 2012 is within one student of the 2008 projection, while middle and high school enrollment have trended higher than that earlier projection.

Mercer Island is not alone in seeing greater growth in recent years. Seattle, Bellevue, and Lake Washington have also seen better than expected enrollment growth since the summer of 2007 when the real estate slow down reached the Puget Sound. In Bellevue and Seattle specifically, families who might have normally moved out to suburban areas to buy homes have opted instead to remain in the urban areas and send their children to the public schools.\* A quick perusal of the enrollment trends since 2007 shows that K-12 enrollment growth in King County has tended to be concentrated in urban job centers (like Seattle, Bellevue, Lake Washington, and Renton), or in other areas (like Mercer Island and Issaquah) that are close to urban job centers. Areas in the far south, north, and east of King County, like Auburn, Kent, Northshore, and Federal Way, have seen their enrollment decline as fewer families are opting to move out to these suburban areas.

\*This observation is based on analysis of the enrollment trends in each of these districts that was completed by the present author over the past two years. Some of the trends in Seattle are also due to the change in the student assignment plan which now allows all children to attend their neighborhood school.

# Introduction

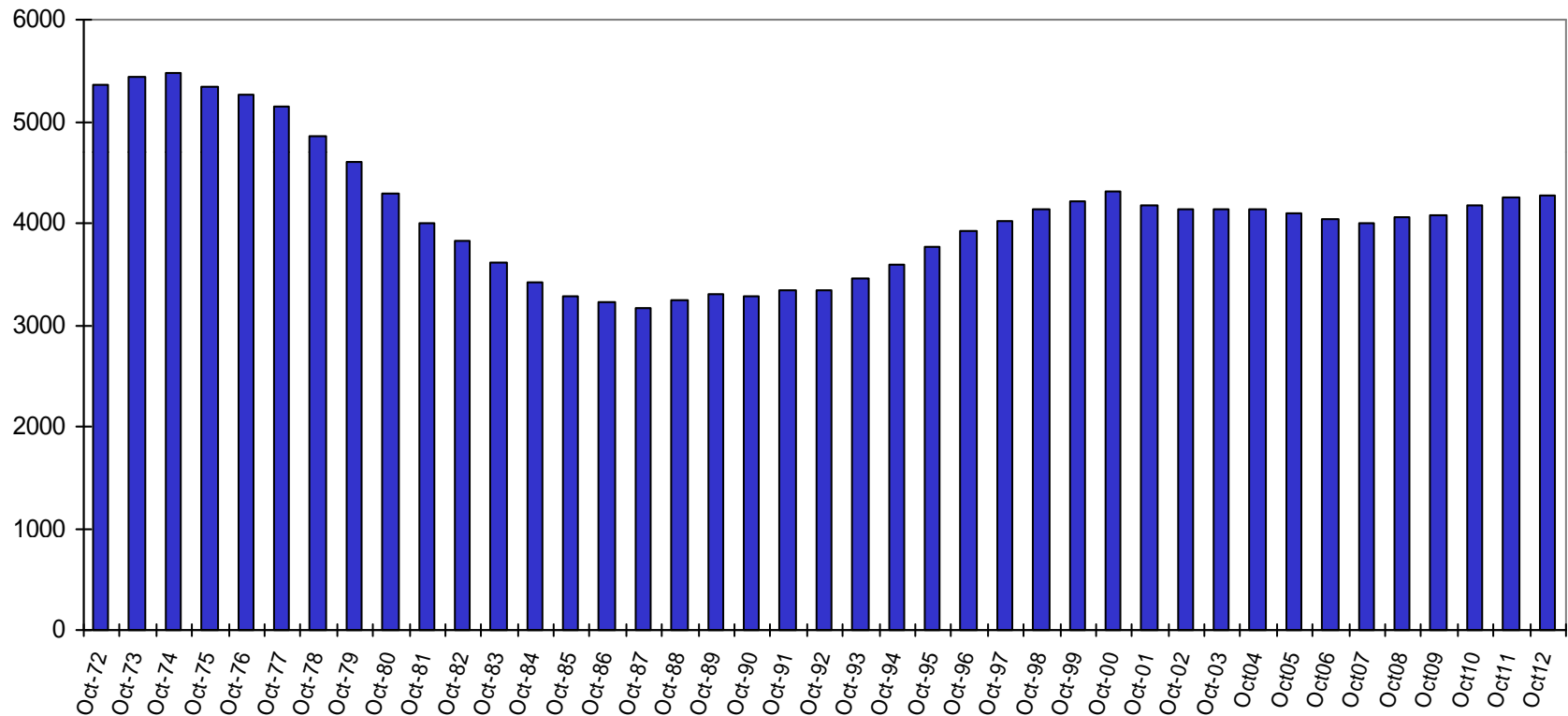
## Recent Trends in Enrollment

This trend may be temporary, of course, due to the recent economic recession and the downturn in home prices and sales. And there is already some evidence of a change in the October 2012 enrollment data. The Auburn and Tahoma school districts saw their enrollment grow for the first time in four years. In addition, the Northshore School District gained over 400 students between October 2011 and October 2012. The initial take on these trends is that they were driven primarily by improvement in new home construction and sales.

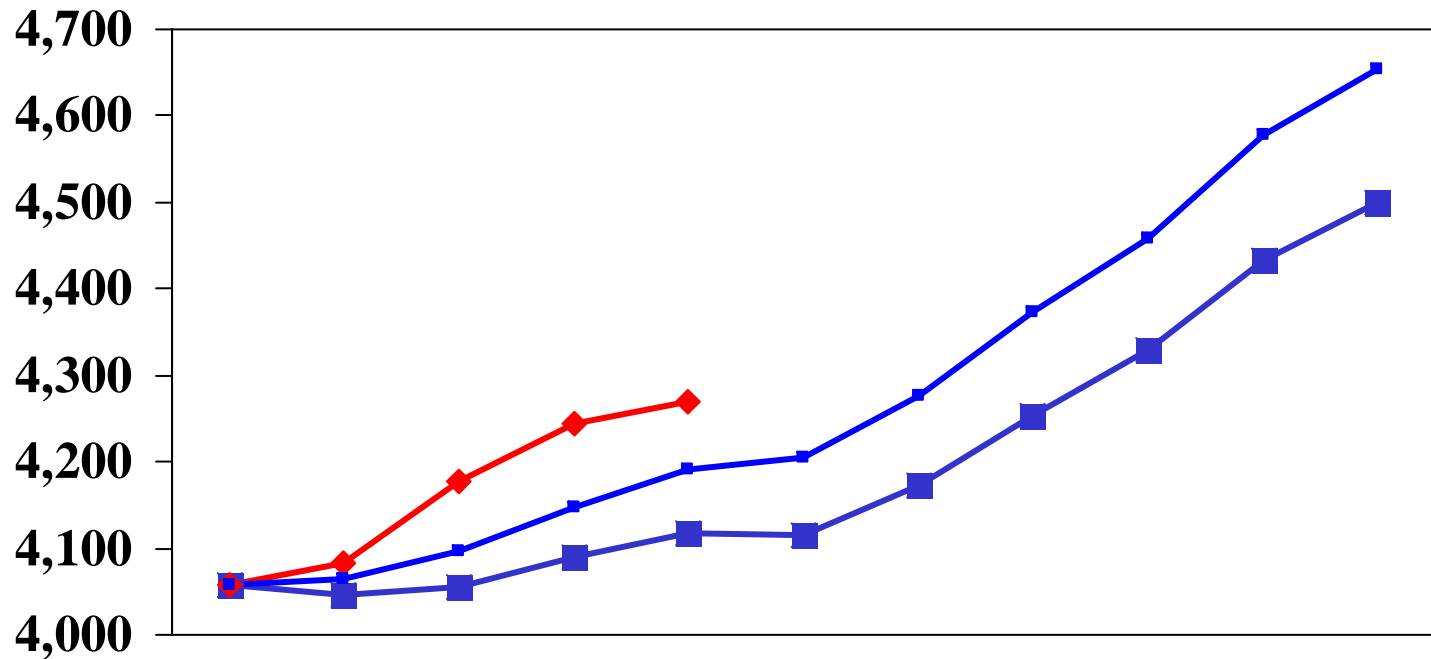
Looking ahead we may start to see a return to a more “normal” pattern in which families with children move to outlying suburban areas, where homes and land are cheaper. But there are also reasons to think that most districts in the county may see enrollment gains over the next decade. King County births have been trending higher since 2006 as the number of women reaching their child bearing years has increased. And the State of Washington is predicting a marked increase in K-12 enrollment statewide between 2015 and 2025 primarily due to more births. Similar to the 1990’s, it is likely that most of the districts in King County will start to see enrollment gains in the coming decade as the grandchildren of baby boomers become eligible for school. Forecasts from the present author as well as forecasts of the Age 5-19 population from the State suggest that we could see an additional 20,000 to 30,000 K-12 students in King County between now and 2020.

# Mercer Island Enrollment Trend

1991-2012 October P223 Enrollment  
1972-1990 P105 State of Washington

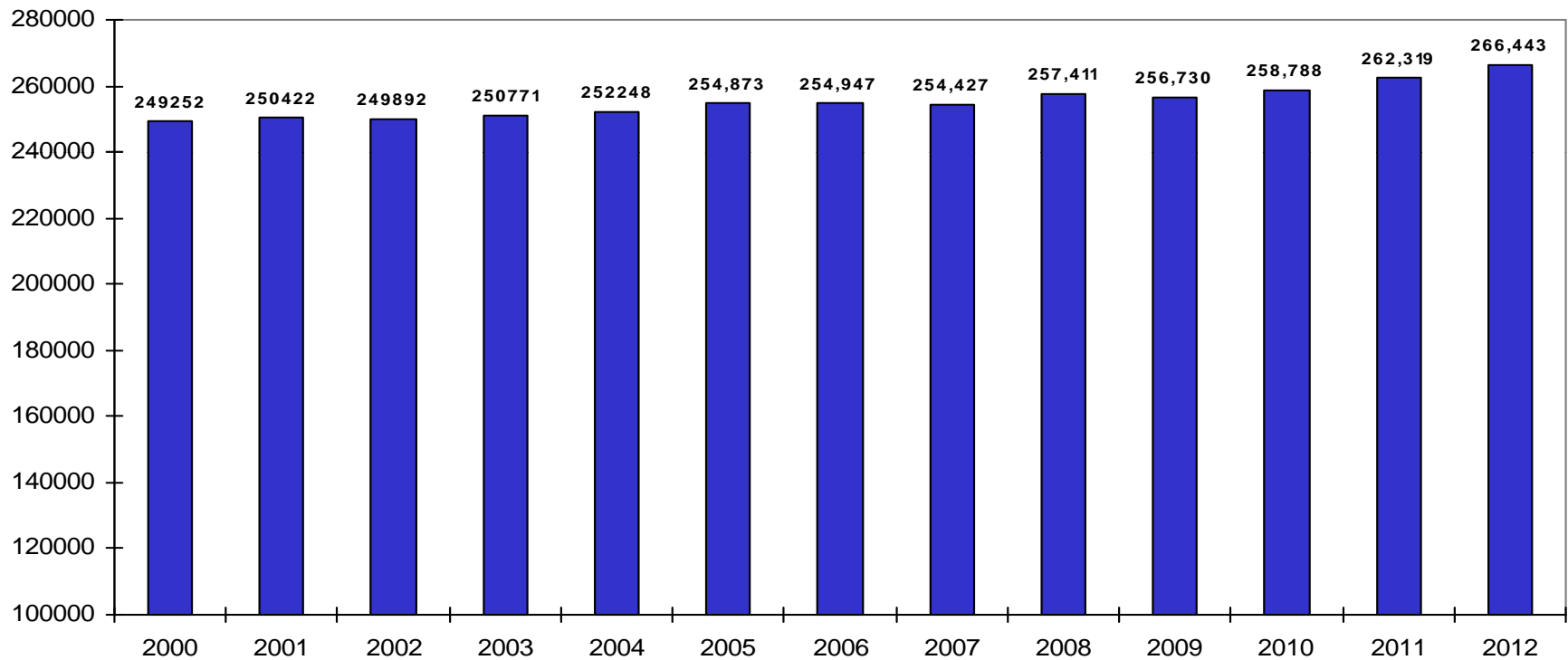


# Medium and High Range Forecast from Dec 2008 Compared to Actual Enrollment



	Oct_08	Oct_09	Oct_10	Oct_11	Oct_12	Oct_13	Oct_14	Oct_15	Oct_16	Oct_17	Oct_18
Medium Range Forecast (2008)	4,058	4,045	4,056	4,090	4,118	4,115	4172	4254	4329	4434	4500
Actual Enrollment	4,058	4,083	4,177	4,243	4,270						
High Forecast	4,058	4,065	4,096	4,148	4,192	4,204	4276	4372	4459	4577	4653

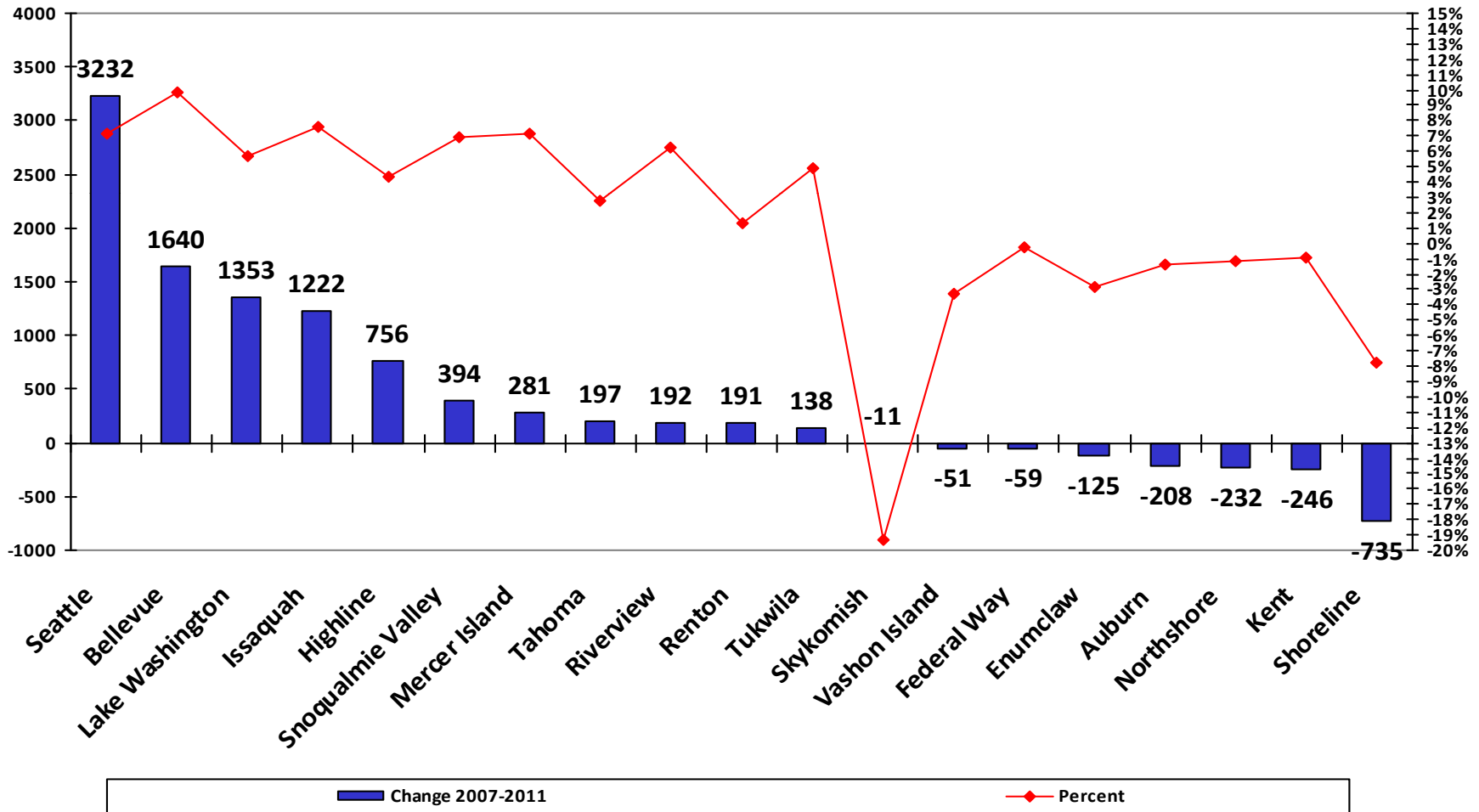
# King County Public Schools Enrollment Trend



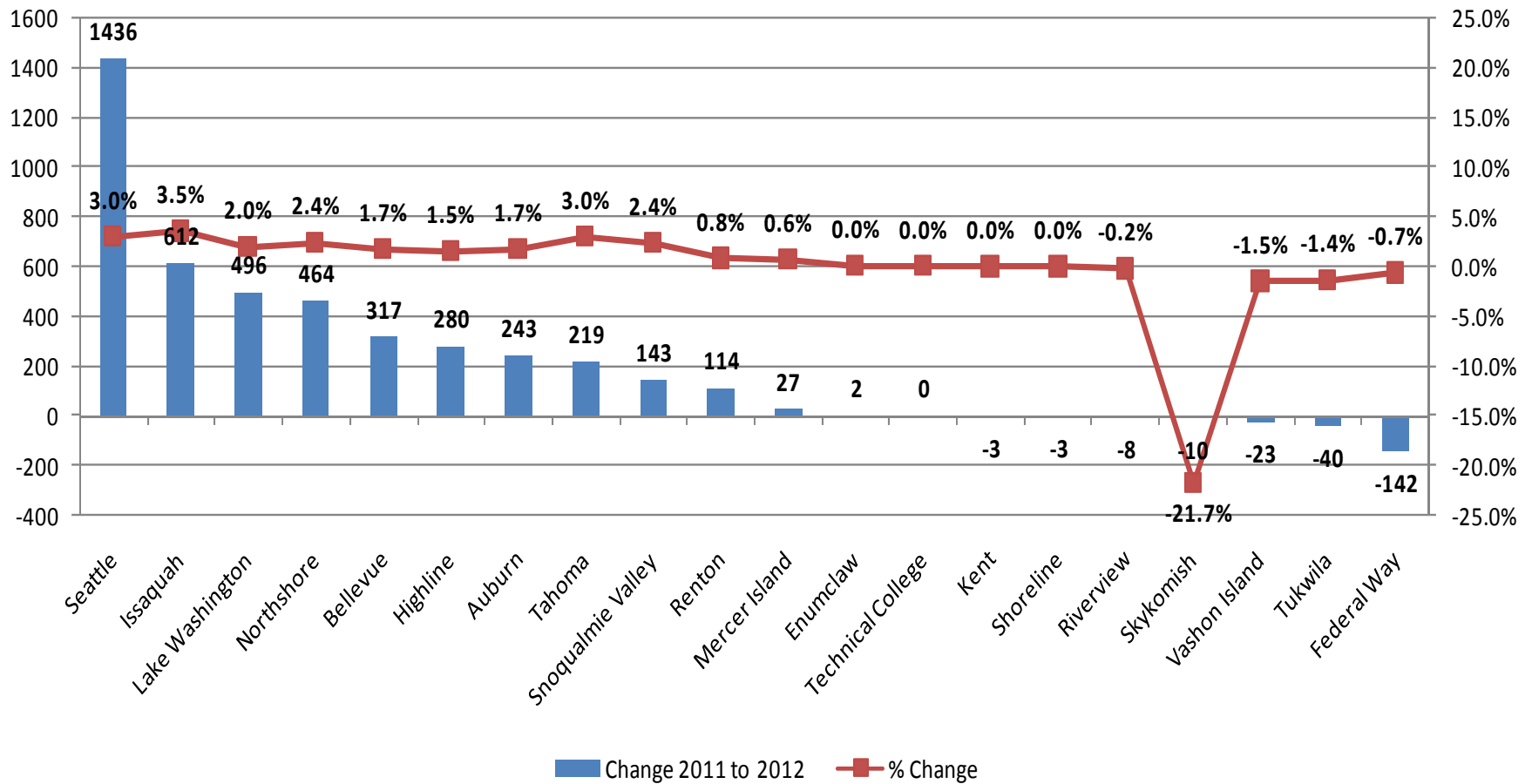
# King County School Districts

## Change in Enrollment From Oct 2007 to Oct 2011

*Numbers may have changed since the original reporting of the data*



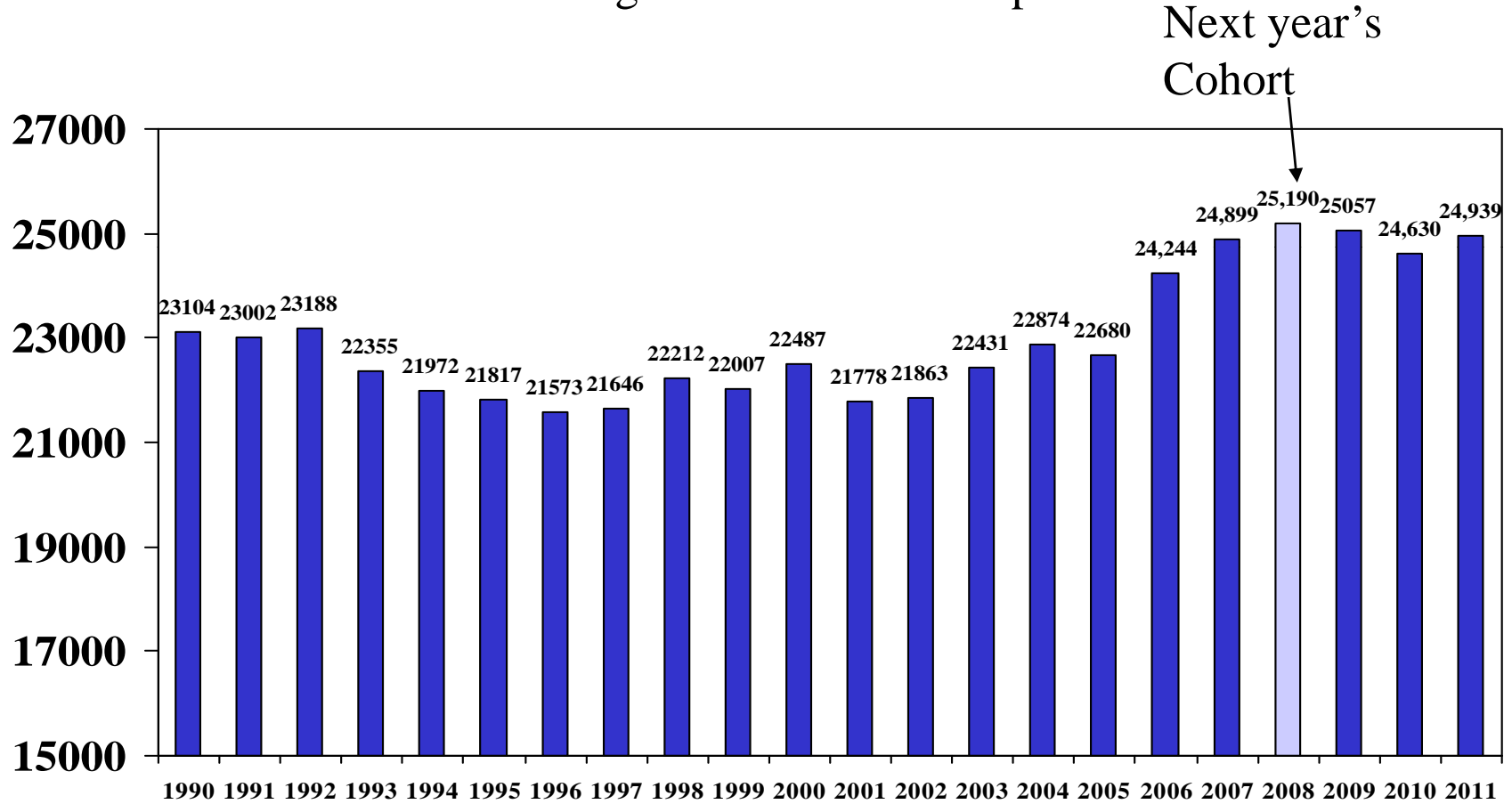
## Net Change in Enrollment for King County Districts Oct. 2011 to Oct. 2012





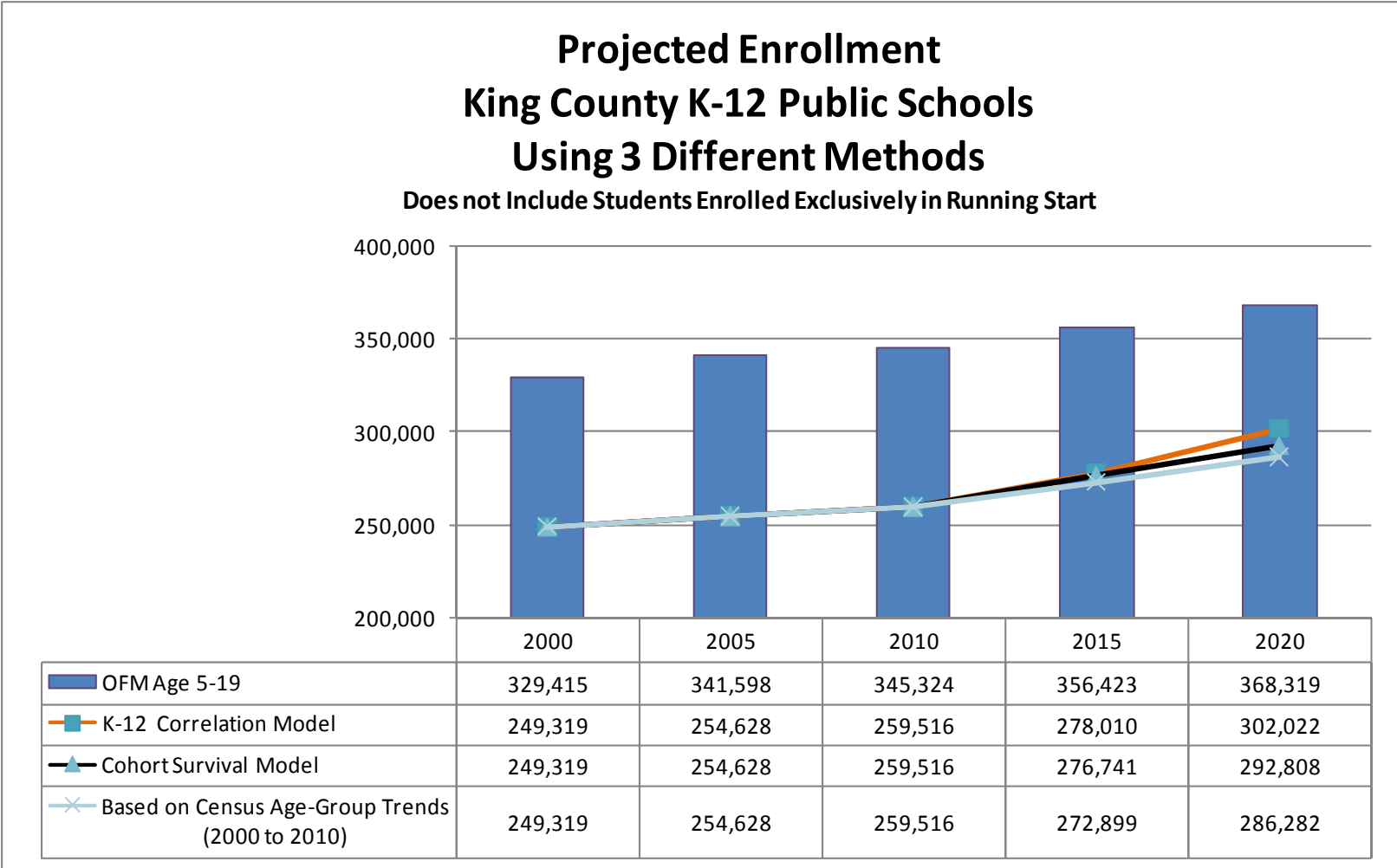
# King County Births

Source: Washington State Health Department



# Projected Enrollment: King County K-12 Public Schools Using Three Different Methods

Note: Does not include students enrolled exclusively in Running Start;



# Mercer Island Enrollment Patterns

Mercer Island, of course, will be affected by these trends. But the trends on the Island are somewhat different from other areas. The more children that are born on Mercer Island and in the county, the higher enrollment is likely to be over time. But this growth is not always seen initially at the kindergarten level. Kindergarten enrollment in Mercer Island has tended to range between 200 and 260 students annually over the past two decades, even with some upward and downward trends in births. Mercer Island's kindergarten enrollment averages between 1% to 1.2% of the county births (comparing kindergarten enrollment in a given year to county births five years prior to that year) and between 150% and 190% of the city births in a given year (the number of city births is very small which is why the range is so large). These trends are reasonably consistent and allow for reasonable predictions of kindergarten enrollment.

But the kindergarten enrollment does not follow a distinct linear pattern. Some years when city births are up kindergarten enrollment is down and in other years the opposite is true. It is true, of course, that the number of students enrolled in kindergarten in a given year, always exceeds the number of city births on the Island five years prior to that enrollment year. This indicates that the number of families with preschool age children moving into the District, exceeds the number moving out. But however big the kindergarten enrollment is in a given year, the graduating class from the previous year is typically a little bit larger (because families with children move in at the continuing grades and eventually graduate). And this trend exerts a downward pull on enrollment.

# Mercer Island Enrollment Patterns

So why does enrollment grow? Most of the enrollment gains on the Island occur at the continuing grades as families with children move in and out of the District. An examination of grade level trends shows that at most grades the District sees a net gain in enrollment. More families with children move in than move out at the continuing grades over the course of the year. This can be seen pretty clearly by looking at cohort ratios. A cohort ratio divides the enrollment at a given grade in a given year (say 2<sup>nd</sup> grade) to the enrollment at the previous grade from the previous year (1<sup>st</sup> grade). A ratio greater than one indicates that more families move in than move out over the course of the year. A ratio less than one indicates that more families with children move out than move in. For Mercer Island the cohort ratios are greater than one at almost every grade every year. This generally indicates that Mercer Island is a “move up” district in which families come here looking for a better home or good schools. A similar pattern is seen in Bainbridge Island, which has small kindergarten classes and greater net gains at the continuing grades.

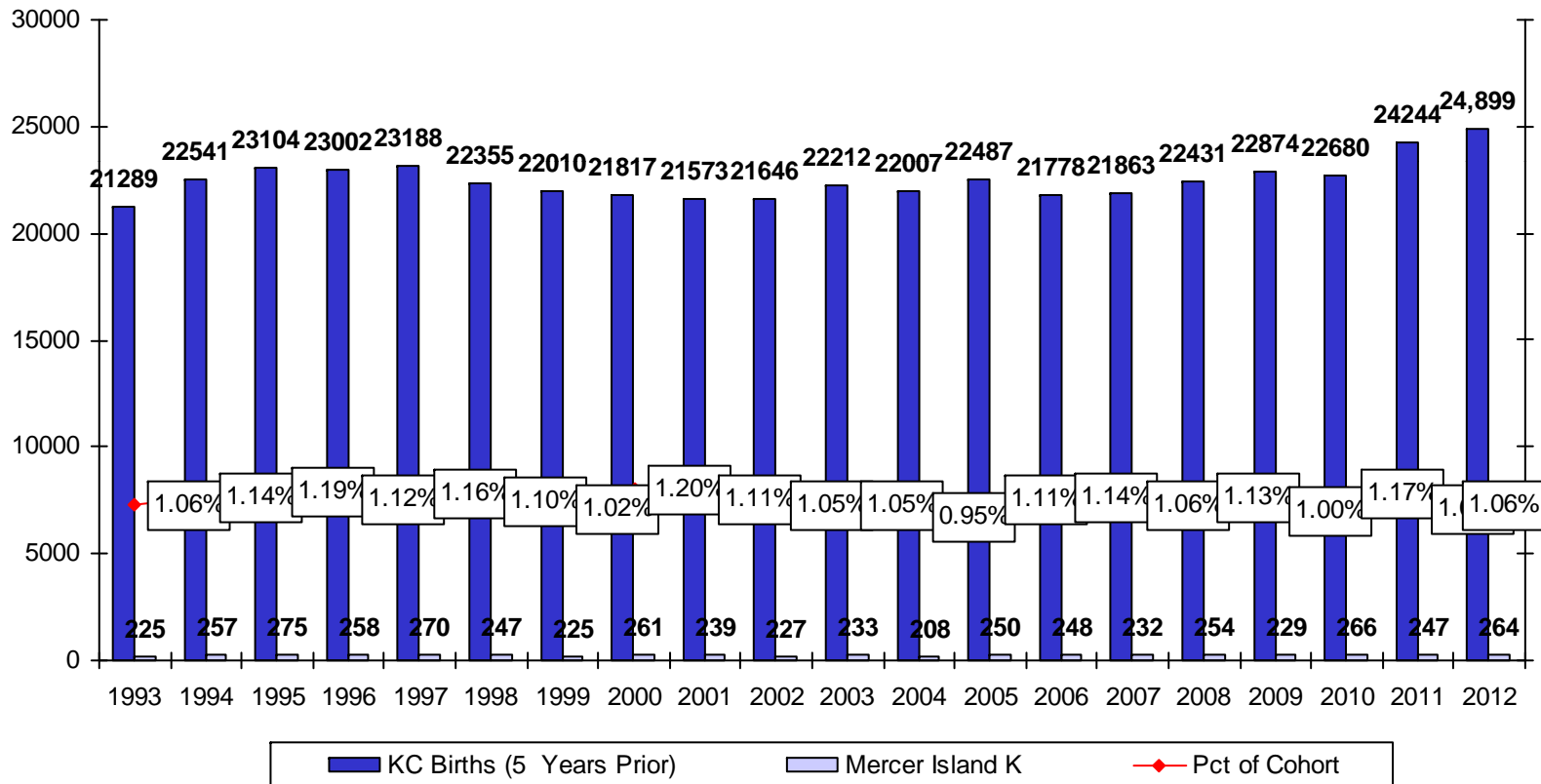
So what is likely in the coming decade? Given recent birth trends, and projected births, it is likely that K-12 enrollment will continue to grow in Mercer Island and the region. But there are reasons to be cautious about how much growth we will see. Although there have been larger birth cohorts in recent years, fertility rates (the number of children born to women in their childbearing years) were lower in 2009 and 2010 than any time in the previous five years. This means that women have been having fewer children. This could be a temporary trend, of course, related to a weak economy as younger families wait for conditions to improve.

# Mercer Island Enrollment Patterns

But it might also represent a changing trend, in which future generations opt to have fewer children. The birth forecasts in this document show continued increases in births over time, but the gains are lower than those in the report from 2008, primarily due to the recent change in fertility rates. But even with that caveat, the data suggests that births and kindergarten classes in King County should, on average, be larger in the next decade than they were in the previous decade.

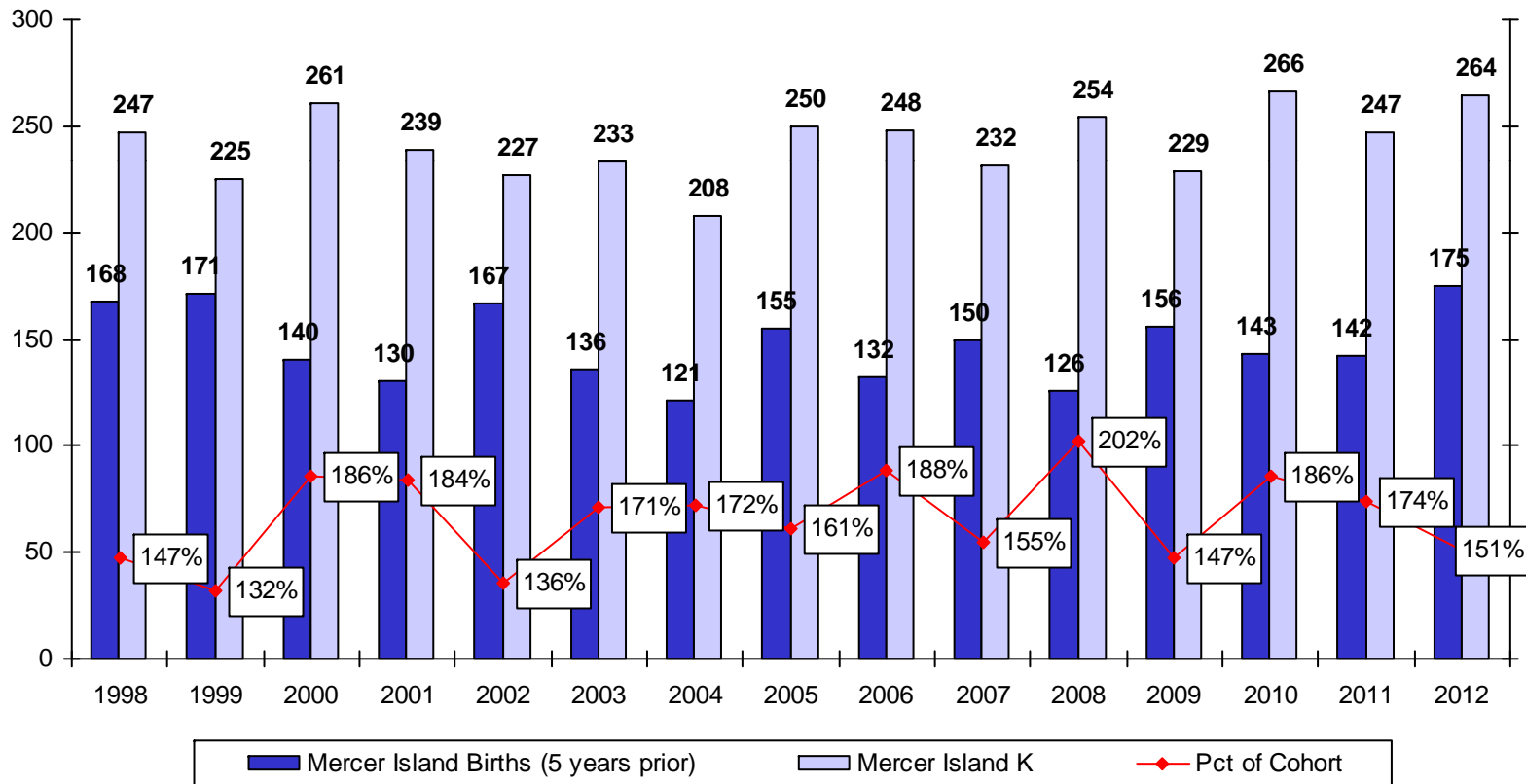
# Mercer Island

## K Enrollment as a Percent of King County Births



# Mercer Island

## K Enrollment as a Percent of City Births



# Grade Progression Rate Example

- Rates for Different Grade Levels:
  - Elementary: K-4 moves into Grades 1-5
  - Middle schools: Grades 5-7 move into 6-8
  - High school: Grades 8-11 move into 9-12
  - A ratio greater than 1 indicates a net gain from families moving in over the course of a year; less than 1 indicates a net loss (more moving out than moving in).

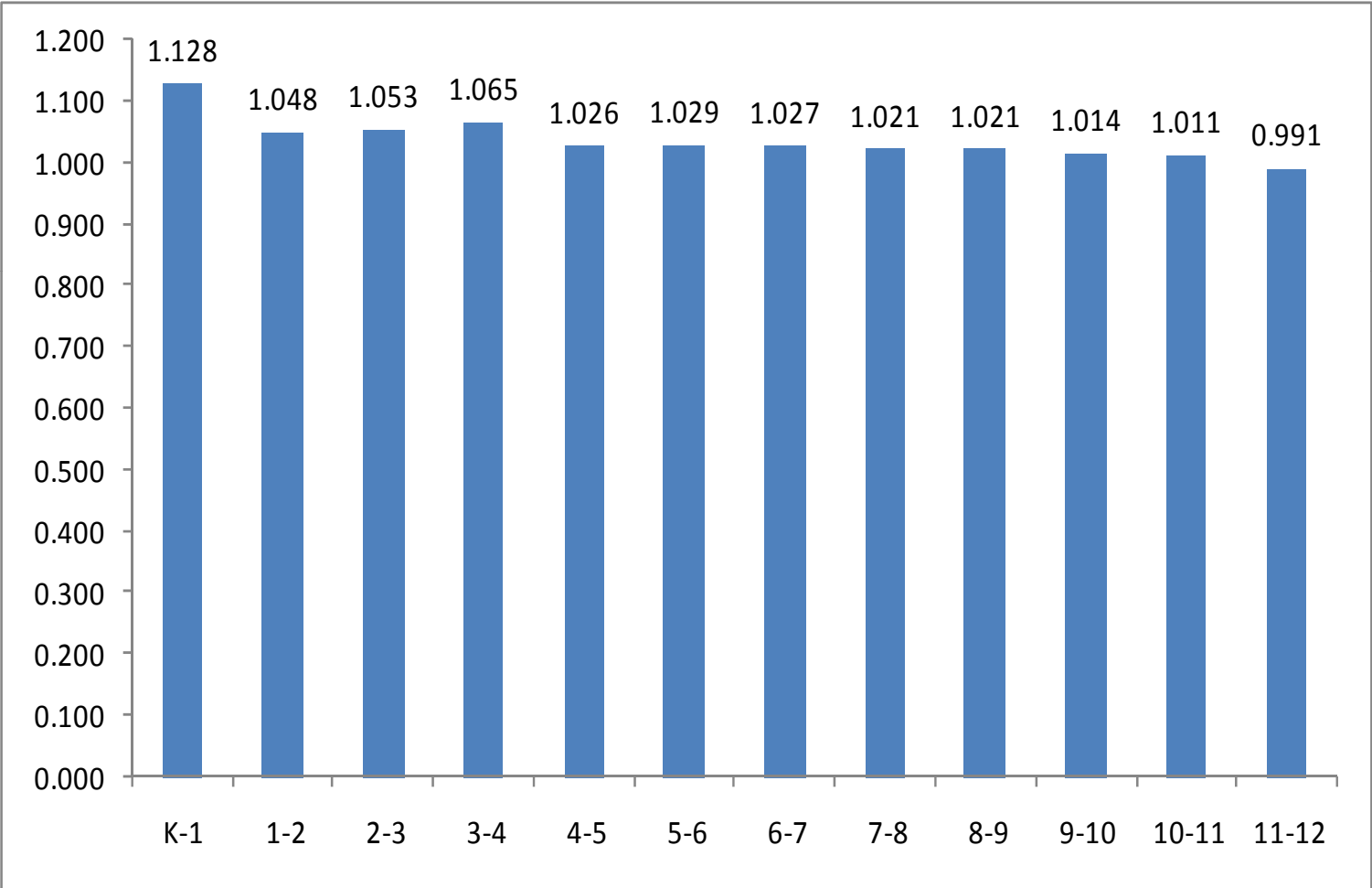
<b>Grade</b>	<b><u>2007</u></b>	<b><u>2008</u></b>
K	232	254
1	276	270
2	294	290
3	255	305
4	311	281
5	<u>279</u>	<u>318</u>
	<b>3654</b>	<b>3726</b>

<b>K-4 Total</b>	<b>Gr1-5 Total</b>	<b><u>Ratio</u></b>
<b>1368</b>	<b>1464</b>	<b>107%</b>



# Average Grade Progression Rates (10 Year Avg.)

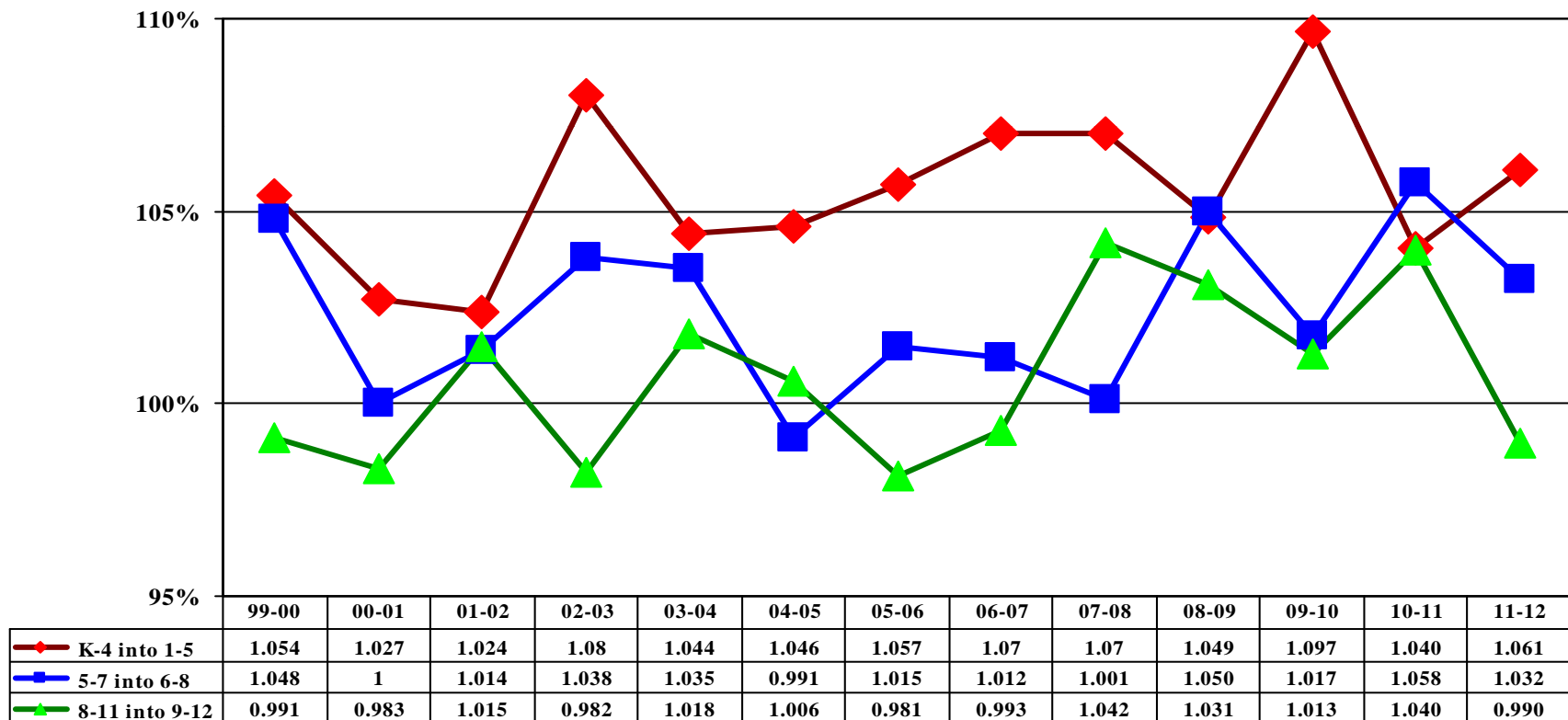
## Cohort Ratio Averages for the Mercer Island School District



# Grade Progression Rates Aggregated

Elementary, Middle and High

## Mercer Island Public Schools

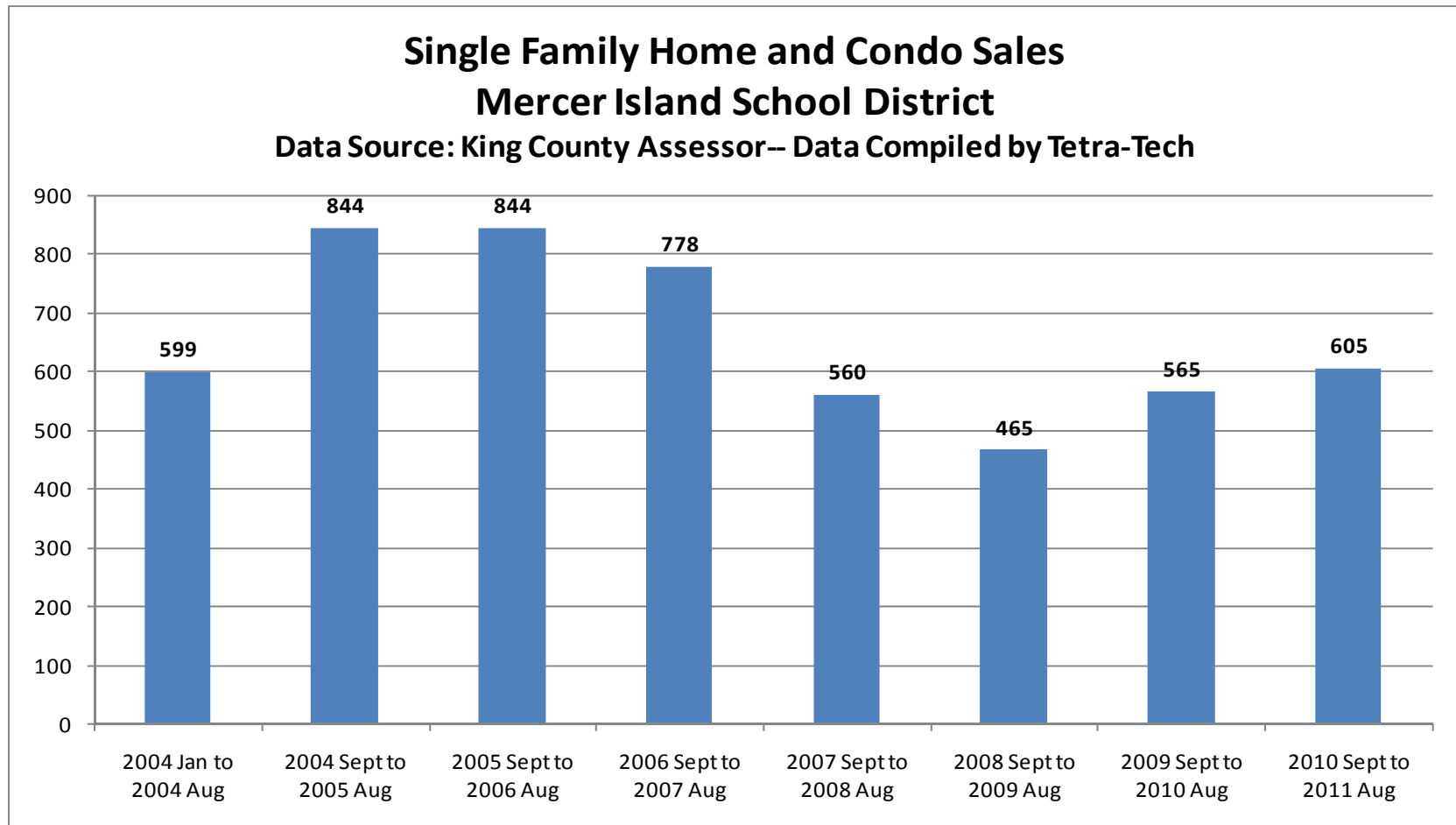


# Mercer Island

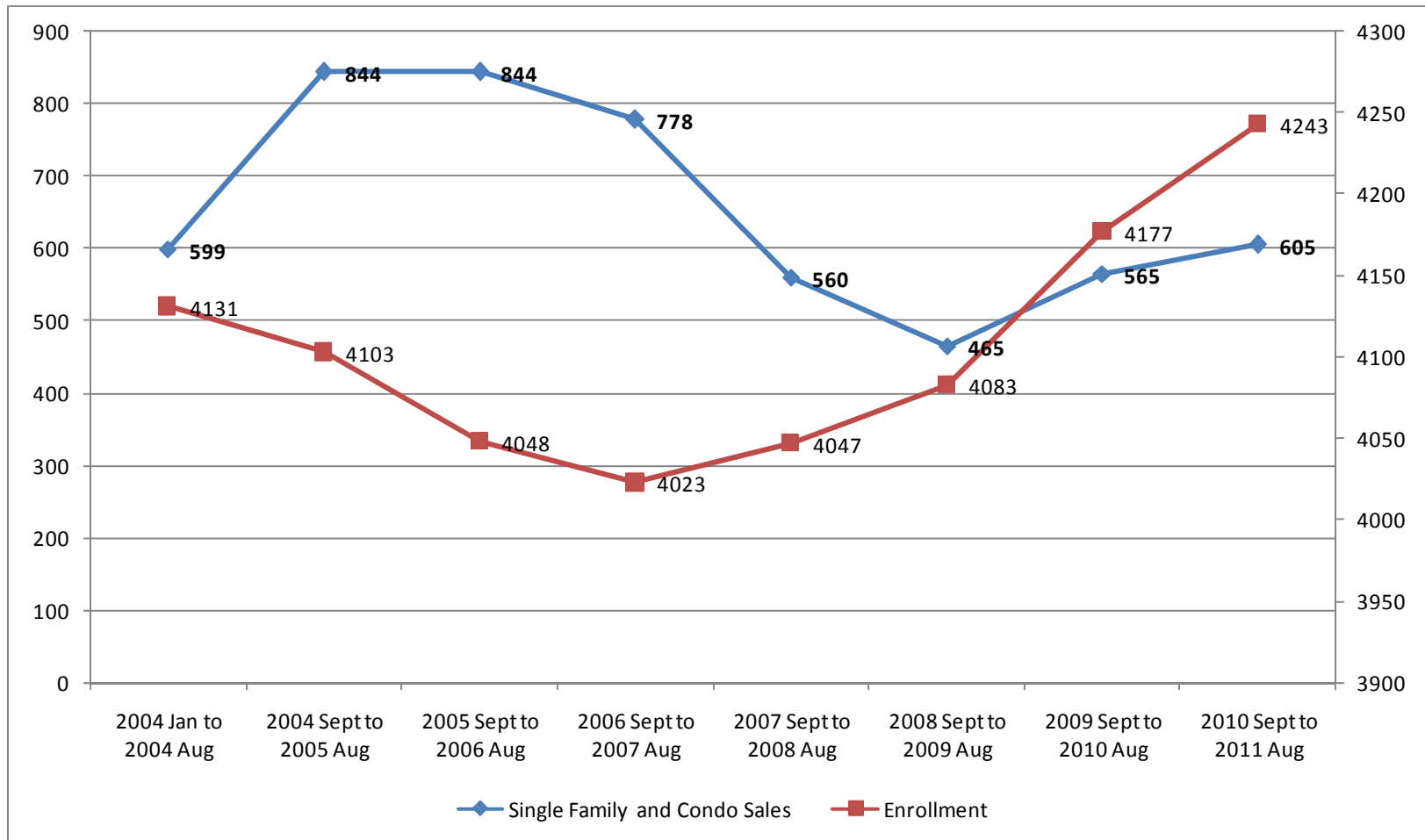
## Enrollment and Home Sales

As noted earlier, much of the change in Mercer Island's enrollment occurs at the continuing grades where the District typically sees a net gain of students. This is likely to continue to be true, as houses turn over and more families with children move in than move out. Like many districts, Mercer Island has seen a decline in condo and home sales since 2007, primarily due to the change in the real estate market. And this suggests that the gain at the continuing grades in recent years may be attributable to more families than usual staying put or NOT moving out (perhaps because it's a bad time to move with a weak housing market and economy), rather than more new families moving in (this would be consistent with the trends that have been documented in Seattle and Bellevue). But whatever the case there is reason to believe that the district will continue to see gains at the continuing grades. If nothing else, the projected increase in the K-12 population over time, means that there will be more families with children looking for a place to live in the coming years.

# Single Family and Condo Home Sales Mercer Island



# Home Sales and Enrollment Mercer Island



# Mercer Island

## Enrollment, Population Growth and Housing

The general population in the county and in Mercer Island is also expected to increase in the coming decade. King County's population has been growing at a rate of just over 1% annually over the past five years. And in recent years, the rate of growth in King County has exceeded the rates in Pierce and Snohomish County, reversing the trend that was seen between 2000 and 2005. This again may be due to the recent change in the real estate market and the recent recession in which migration to the outlying suburban areas declined.

This change in population growth is also reflected in the K-12 enrollment figures since 2007. King County has increased its share of the K-12 population in the Puget Sound, compared to Pierce, Snohomish, and Kitsap County consistently over the past decade, and especially in the past six years. Should this trend continue, we could see greater growth in the K-12 population in King County than was predicted even a few years ago. This is why estimates of the future K-12 population gain in the county are uncertain, ranging between a low of 20,000 and a high of 30,000 students by 2020. The higher number is more likely if current migration trends among the counties continue to persist.

# Mercer Island

## Enrollment and Population Growth

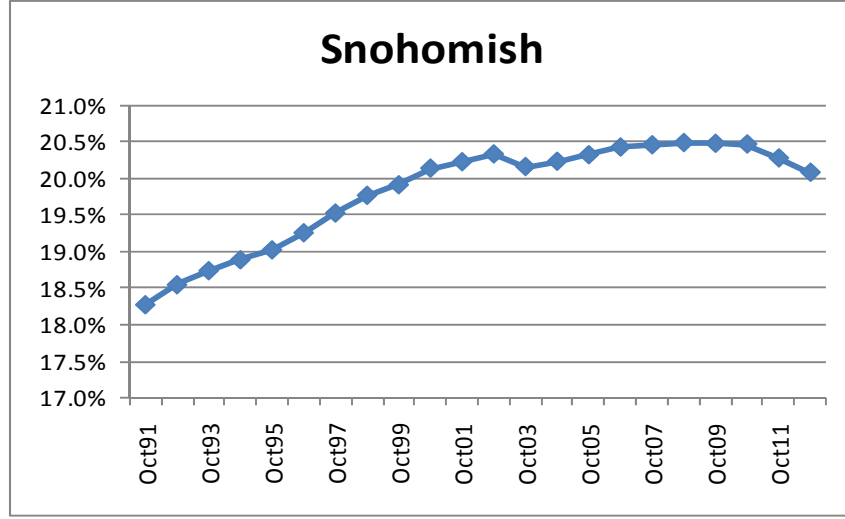
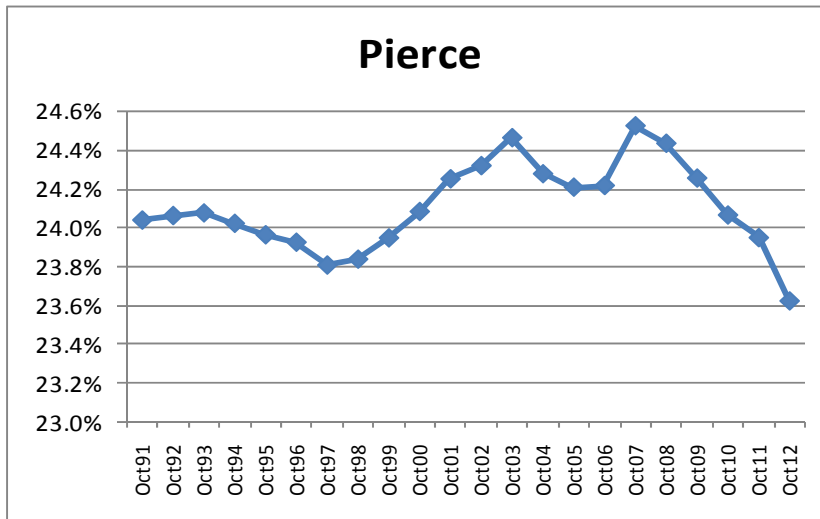
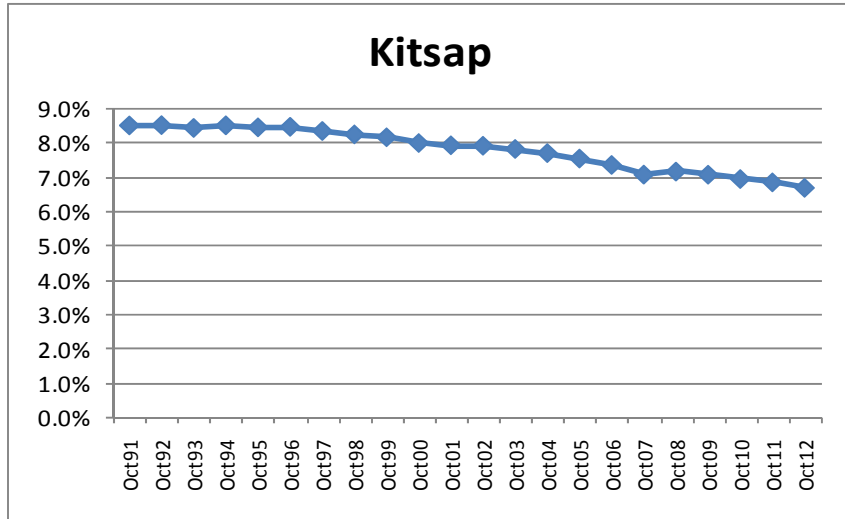
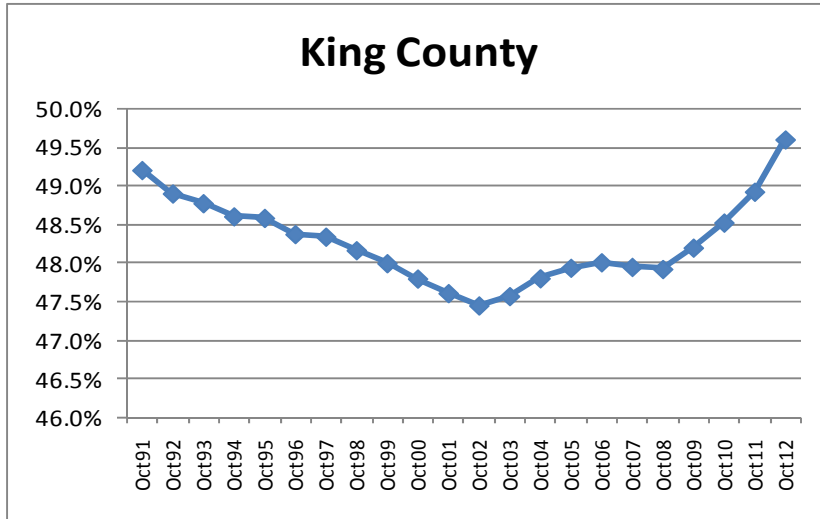
Forecasts from the Puget Sound Regional Council also predict greater growth in Mercer Island in the coming decade than in the previous decade. This growth will likely be due to greater density, involving an increase in multi-family housing like townhomes or condos. This is especially true since there is very little buildable land on Mercer Island suitable for single family development. In fact according to the New Home Trends Database there only five single family homes currently planned for future construction and sale on the Island.

The District will, of course, see some K-12 enrollment growth from multi-family projects. According to data provided by the District, the recently completed two and three bedroom units in the town center area produced an average of approximately 25 students for every 100 two or three bedroom units. Or, to put it more concretely, there were 356 two and three bedroom units that were built in recent years and the District saw 92 students coming from those units. Not all of the projects are completed and it is likely that the District will see additional students. But it is important to remember that turnover of existing single family homes is still, by far, the most prominent factor leading to increases in enrollment.

# Percent of K-12 Enrollment by County

All Charts Combined Add to 100%

P223 October Enrollment

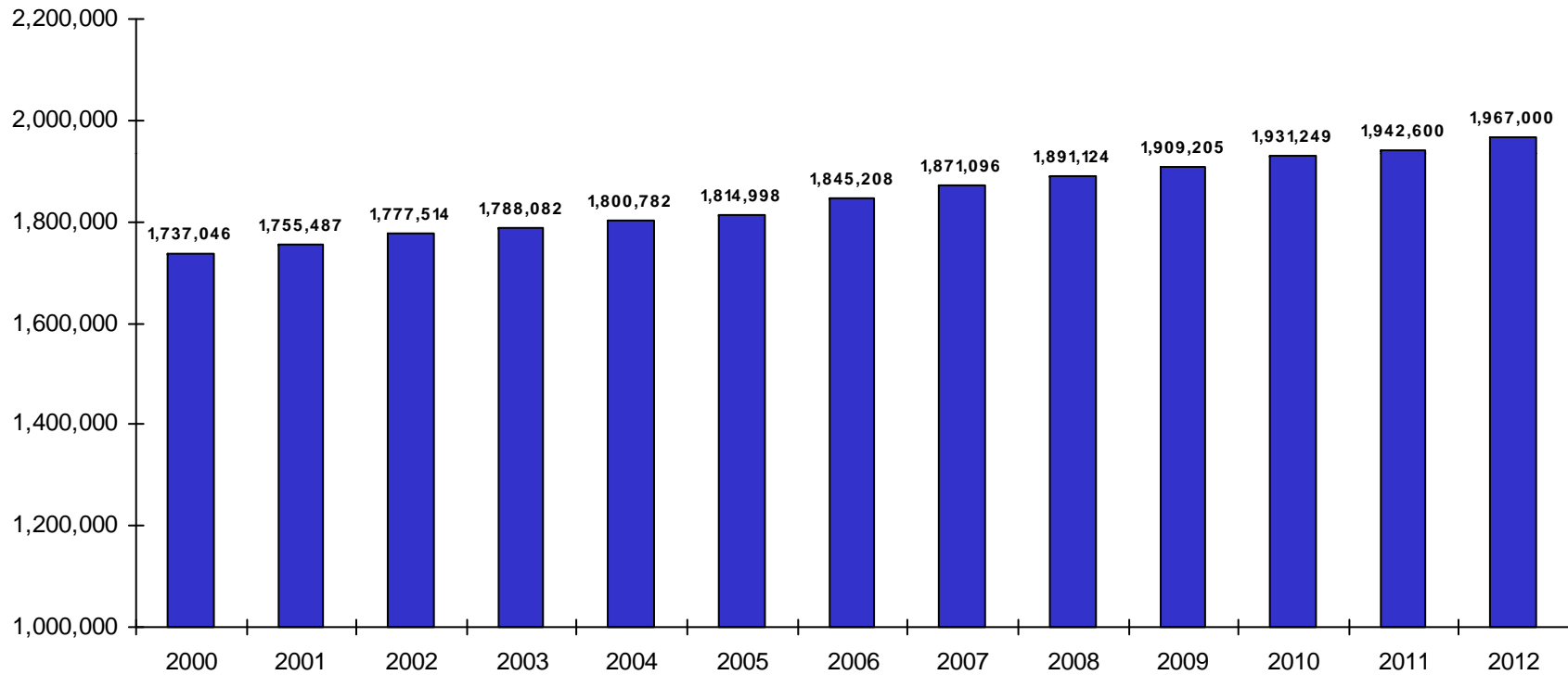


Generic Slides



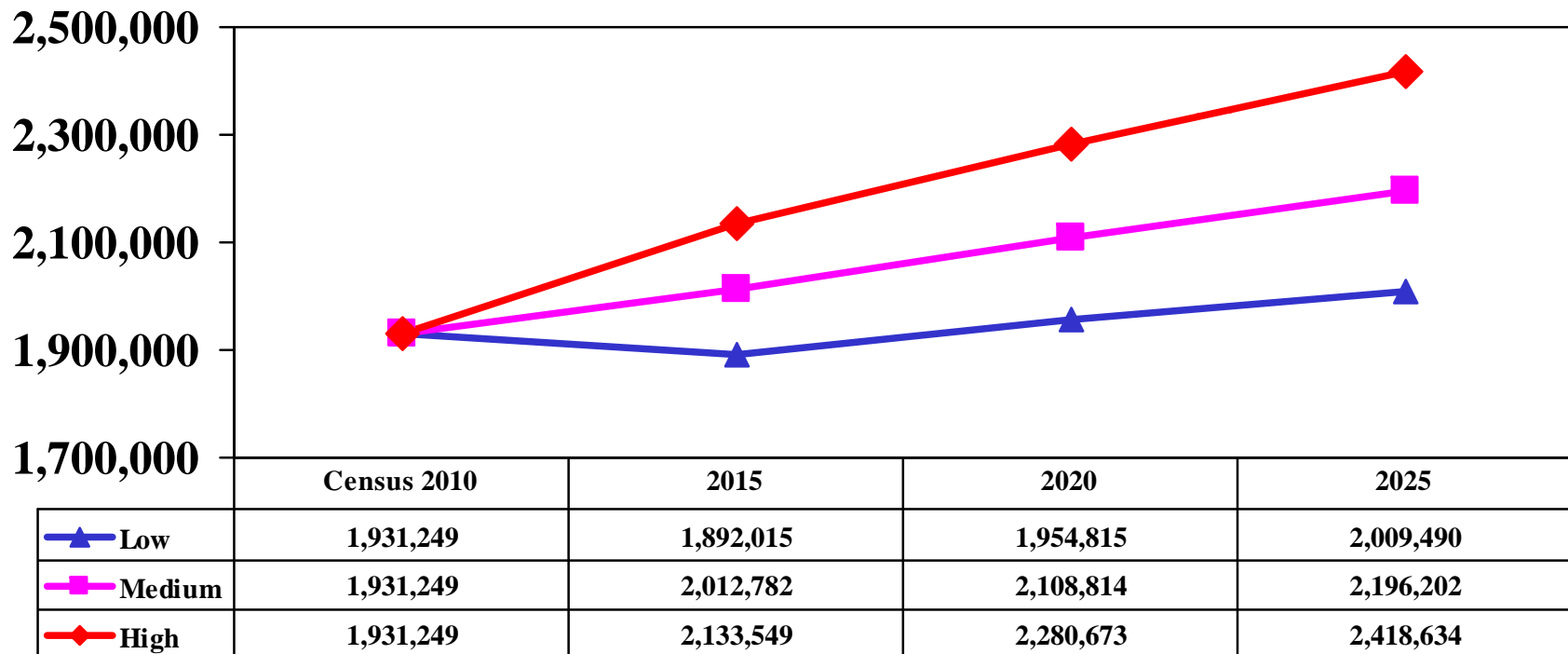
# King County Population Estimates

Source: OFM State of Washington



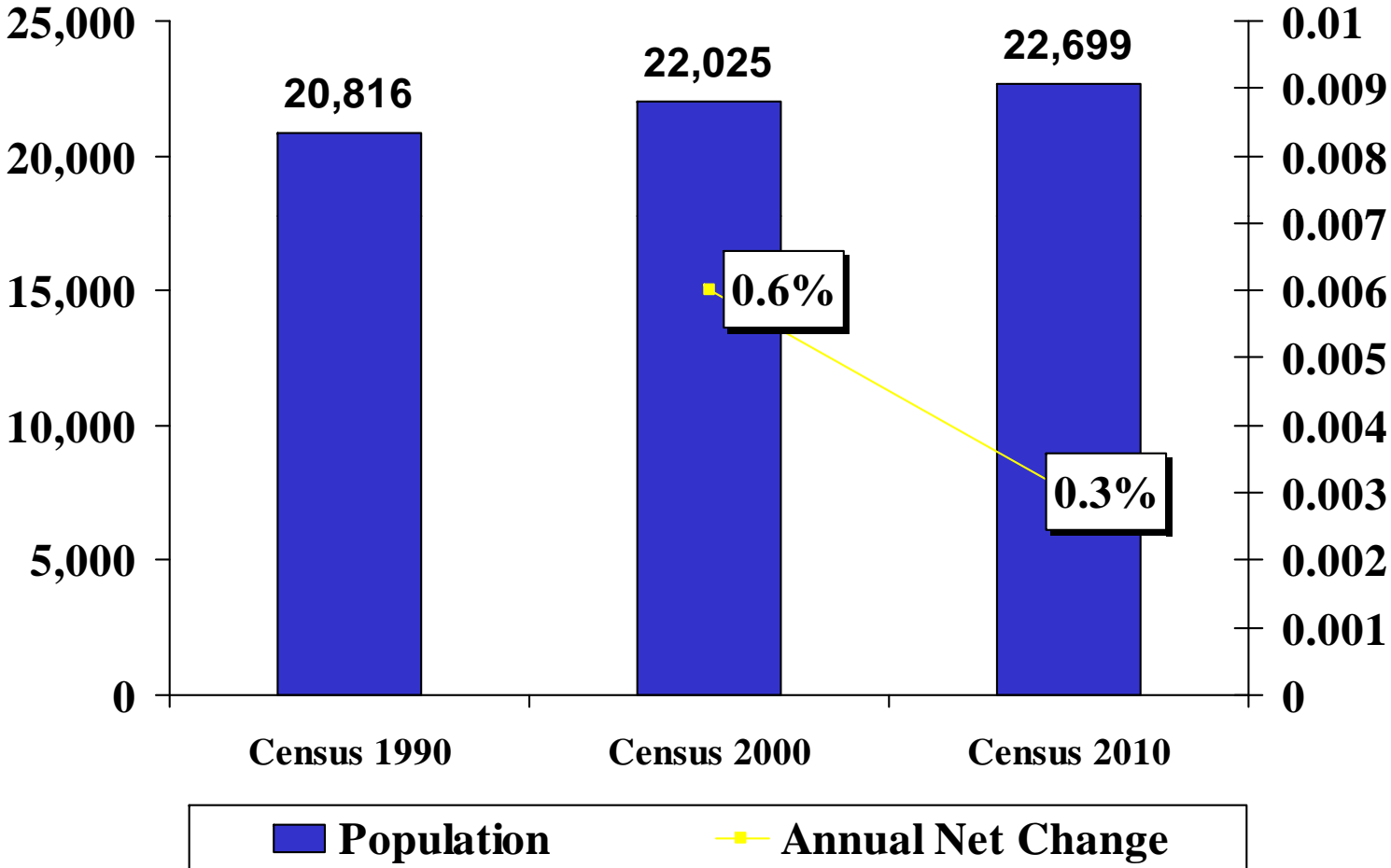
# OFM 2012 County Population Forecast (King County)

Low, Medium, and High Population Forecasts  
 Source: OFM State of Washington 2012 Forecast



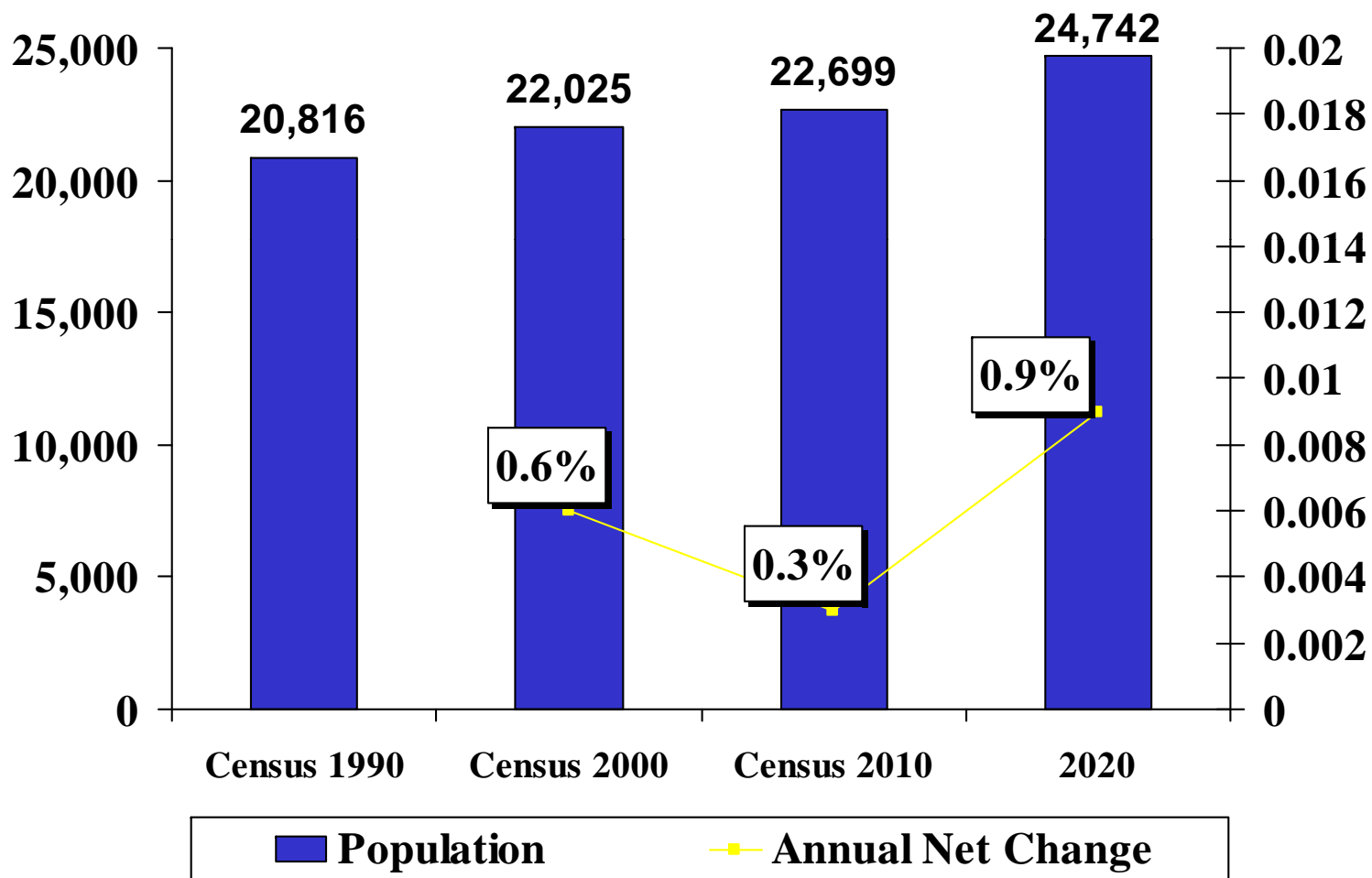
# Mercer Island Population Estimates

Source: Census Data



# Mercer Island Population Forecast

Based on the Puget Sound Regional Council's Projected Growth Rate for Mercer Island



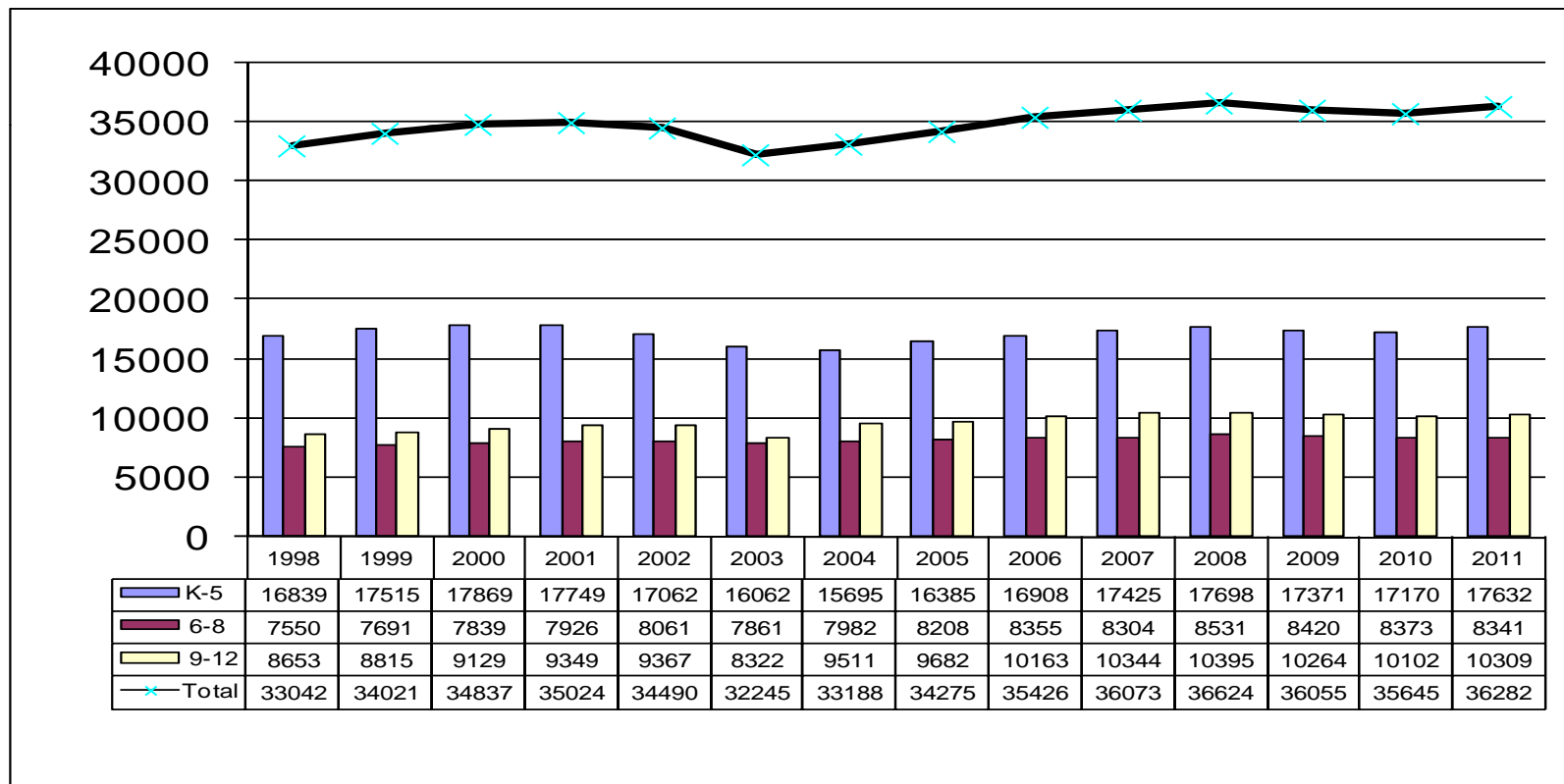
# Mercer Island Private Schools

One final factor that needs to be considered is the effect of private schools. Enrollment in private schools located on Mercer Island has trended up in the past decade. There were 680 K-12 students enrolled in private schools on Mercer Island in October 2011, up from 556 that were enrolled in October 2000. But it is important to remember that we do not know where students attending private schools actually live. Many of them probably do live on the Island. But some may come from other areas. And overall, the small net change in private school enrollment suggests that private schools have a relatively minor impact on public school enrollment in Mercer Island. This is not that surprising since private schools will typically have constituencies, people who attend for religious or family reasons, who may never even consider public schools as an option.

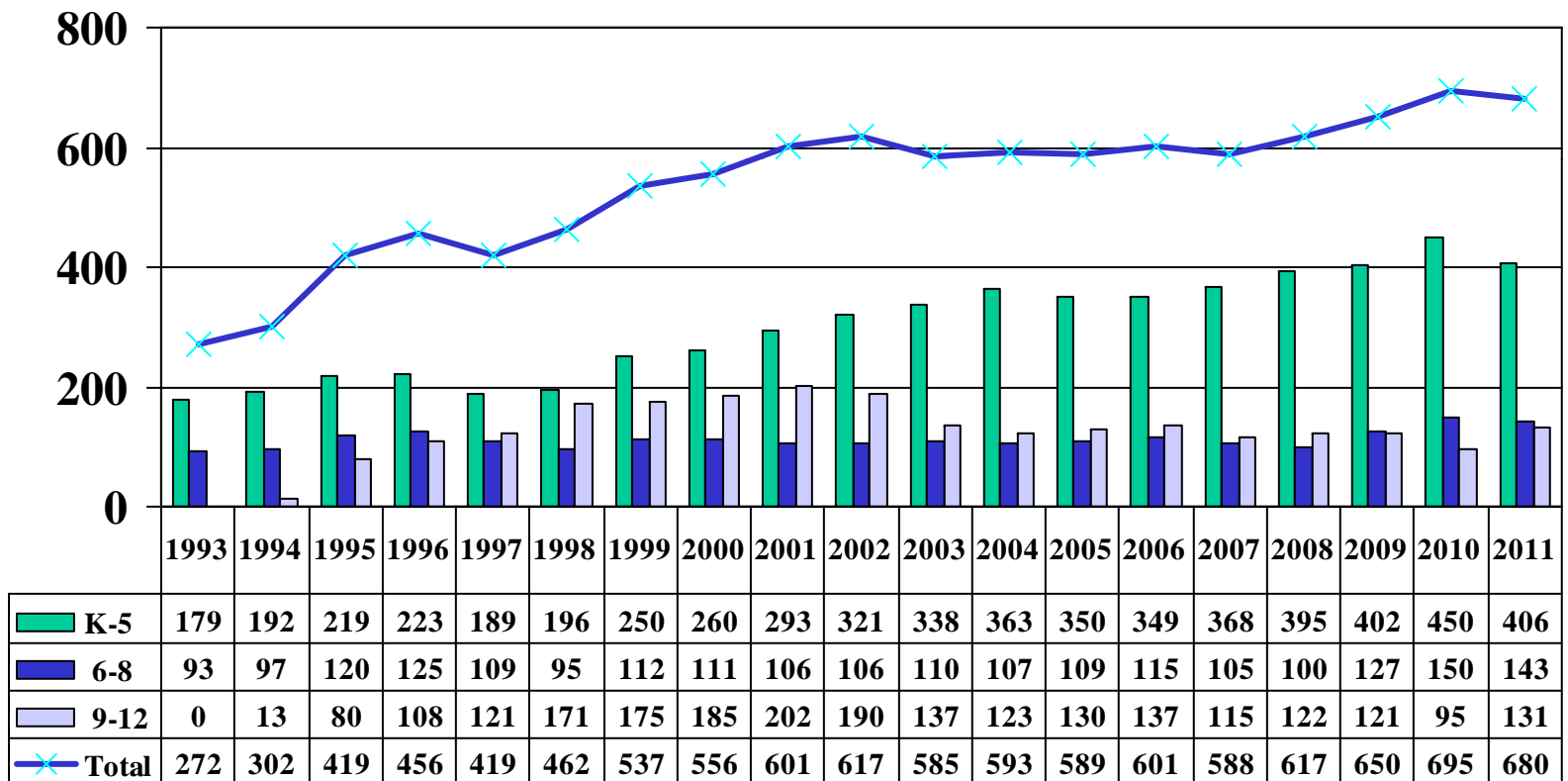
There are families, however, who might consider private schools as an alternative to public schools, but the trends of the past decade suggest that at best, private schools on Mercer Island have increased their share of the K-12 market by about a tenth of a percentage point annually. This information can be factored into the forecast, but practically speaking it means that the public school enrollment will be adjusted downward by a few students annually due to losses to private schools. And it is important to emphasize that doing this is purely a statistical exercise based on observed historical trends. We have no concrete information about how many students actually opt for private schools over public schools or even how many families consider both options.

# Private School Enrollment King County K-12

Note: 2003 and 2004 Private school data from OSPI was missing schools that are traditionally included thus skewing the trend.



# Enrollment for Private Schools Located in Mercer Island's Service Area



# Enrollment Projections



# Enrollment Projections

## Methods and Assumptions

An enrollment forecast is based on assumptions and mathematical calculations that convert these assumptions into numbers. The previous sections have identified a number of assumptions about births, grade level enrollment trends, and population growth that are likely to impact the district in the coming years. This section describes the specific assumptions that guided the development of the forecasts.

The forecasts for the District was based on a consideration of several factors:

The size of future birth cohorts and the projected share of that cohort that is likely to enroll in Mercer Island kindergartens.

Average grade-to-grade growth as students progress through the grades.

Predicted growth in the K-12 and general population and the District's future share of that growth.

The effect of private schools on enrollment.

# Methods and Assumptions

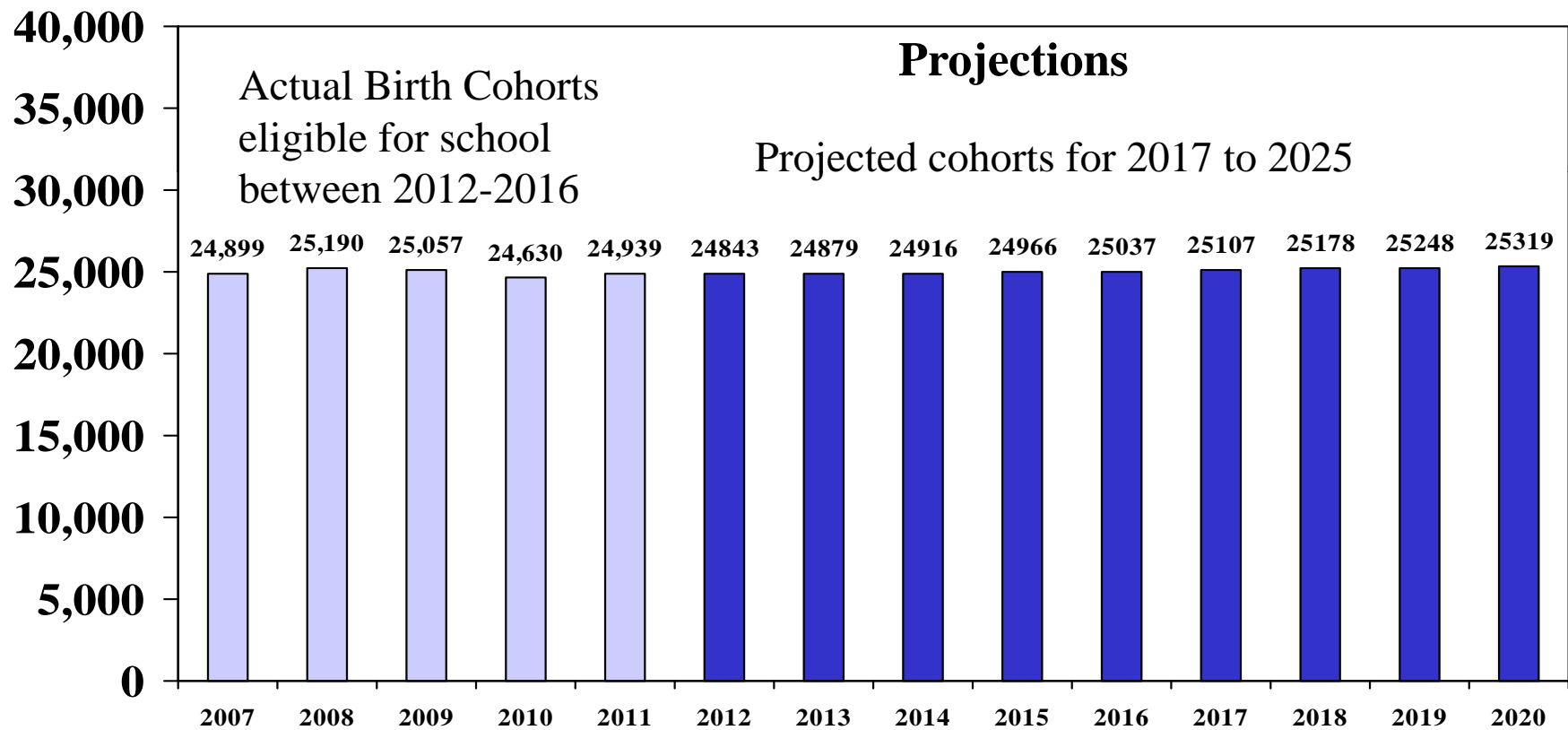
## **Births and Kindergarten Enrollment**

Both county and city births were used to project kindergarten. The number of county births is known through 2011 which means we can predict kindergarten enrollment based on actual births out to 2016. Beyond that point births were projected based on the most recent fertility rates for the county and the forecast of the number of women likely to reach their childbearing years over time, using the medium range county forecast from the State. Births for the city of Mercer Island are known through 2010 (2011 breakdowns by city are not yet available). Births on Mercer Island beyond 2010 were predicted based on the correlation between city and county births. On average city births make up about 6-tenths of a percent of the births in the county. This trend has been consistent over the past two decades.

## **Projecting Kindergarten Enrollment**

Kindergarten enrollments were projected using birth-to-k ratios. The birth-to-k ratio compares the kindergarten enrollment in a given year to births five years prior to that year. The District's birth-to-k ratio has averaged about 1-1.2% of county births for the past two decades and has remained relatively stable. The District's share of city births is greater than 100% since there are families with preschool age children who move to Mercer Island before their children reach kindergarten age. The projection model uses the six year median birth-to-k ratio for both the city and the county to predict future enrollment, taking an average of the two estimates. This method was deemed reasonable since the number of city births is very small and does not always capture the larger birth trends that are likely to affect K-12 enrollment in the county.

# King County Birth Projections



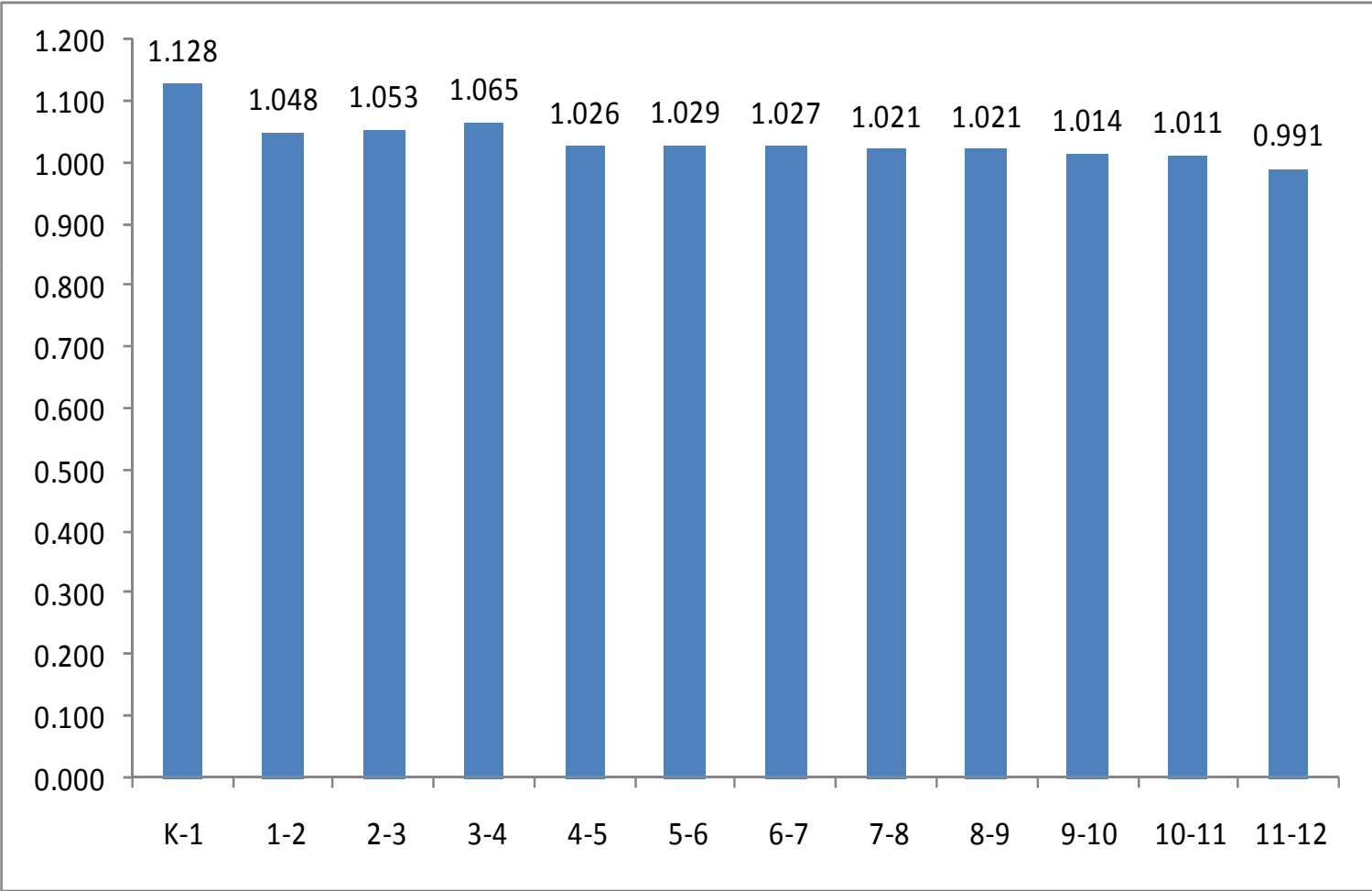
# Continuing Grades

## **Projecting Grades 1-12**

The forecasts at grades 1-12 were based on grade level cohort ratios which predict the net gain and/or loss in enrollment as students progress from one grade to the next. In the last report a six year average of the cohort ratios was used. In general, a six year average provides a reasonable number of data points to help smooth out low and high enrollment years that might distort the average. But the most recent six years represent a unique period in demographic history. Beginning in 2007 the real estate market in the Seattle area began to change, with declining home sales and declining home values. In addition, migration patterns changed with more people opting to stay in urban areas, at least in the near term. For this reason, the past six years may not be representative of the average amount of grade-to-grade growth that is typical for Mercer Island or the region. For the present analysis a ten year average of the ratios was used for projecting enrollment. This average was reasonably close to the median range average of the ratios at each grade, which suggests that it tends to dampen the effect of extreme values (low or high) that we might see for any given year. In cases where the average was well out of line with the median value for the past 10 years, the median was used. The enrollment at each grade level was multiplied by the appropriate cohort ratio to project enrollment forward.

# Average Grade Progression Rates (10 Year Avg.)

## Cohort Ratio Averages for the Mercer Island School District



# Adjustments for Population Growth

## Adjustments for Population Growth

The cohort model shows what might happen if the current trends were to continue indefinitely into the future, with some adjustments for projected changes in the birth trends over time. What we also need to consider, however, is the effect of additional population growth in Mercer Island and the county, especially growth in the K-12 population.

Growth management forecasts from the State show about the same rate of population growth in King County over the next decade as was seen in the previous decade. But there are also indications that due to growth management more of the population will locate in urban areas that are close to transportation and other services. Puget Sound Regional Forecasts of the population for Mercer Island predict greater population growth between 2010 and 2020 than was seen between 2000 and 2010. These forecasts are helpful, since the PSRC predicted population total for Mercer Island in 2010 was reasonably close to the actual total from the Census (**22,838 predicted versus 22,699 actual**). In addition, their forecasts consider the potential impact of growth management. On average the PSRC forecast predicts that the population of Mercer Island will grow at .9 percent (nine-tenths of a percent) annually between 2010 and 2020, right at the predicted King County average from State medium range county forecast, and greater than the .3 percent annual growth rate that Mercer Island saw between 2000 and 2010. This difference can be used as one factor to adjust the projected cohort trends to account for future population growth changes. But this does not tell us how much of the future population growth will be made up of school age children.

# Adjustments for Population Growth

## **School Age Populations**

A simple forecast of the King County School age population suggest that it could grow by .6 percent more on annual basis over the next 8-10 years when compared to the previous 8-10 years. Growth in the near term (between now and 2015) is expected to be slightly lower than this rate (about .3 percent annually over and above the recent trends). These estimate comes from a simple cohort model that uses projected county births and six year grade level enrollment trends to predict future changes in the county K-12 population. The model also suggests that enrollment growth could start to slow some between 2020 and 2025 if the fertility rates remain at their current level

These various estimates provide a similar picture of the future. All of the estimates indicate that population growth and the K-12 population in particular will increase in the coming decade. This is supported by State forecasts of births and the K-12 population, and by the present forecast of births which show an average of 2000 more county births per year between 2006 and 2016 than occurred between 1995 and 2005.

The final forecasts in this document used the results of the cohort model as a starting point for predicting enrollment. The numbers were then adjusted for predicted changes in the population over time. The low model assumes that all the information about future enrollment and population growth is captured in the cohort grade level trends.

# Adjustments for Population Growth

The medium range forecast is adjusted to account for predicted changes in the county K-12 population over time and for predicted changes in the overall population over the next decade due to growth management. The two population forecasts (the State medium range King County growth management forecast and the K-12 population forecast) show similar results. Both suggest that enrollment could grow by six tenths of a percent more on annual basis than is assumed in the cohort trend forecast, whether we base this on general population trends, or predicted changes in the K-12 population out to 2020. For the medium range forecast, the cohort numbers were adjusted upward to account for this additional growth between 2015 and 2020. After 2020, the forecasts show continued growth in the school age population but some slowing of the trend. Obviously, the farther out we go, the less certain we can be of these trends.

Finally, a high forecast was created based on projected changes in the general population for Mercer Island. This forecast assumes that the K-12 population on Mercer Island will grow at rate that is equal to the overall predicted annual change in the general population using the Puget Sound Regional Council forecast. This means that the school age population would grow at the same rate as the general population. There are reasons to be skeptical of this forecast, since the **percentage** of the population that is school age has been declining and may continue to decline in the near term; other segments of the population are growing at a faster rate. Nevertheless, this forecast shows what might happen if K-12 population growth on the Island were to be greater than what is assumed in the medium range forecast. In other words, it shows what happens if Mercer Island were to absorb a greater share of the county K-12 population over time.

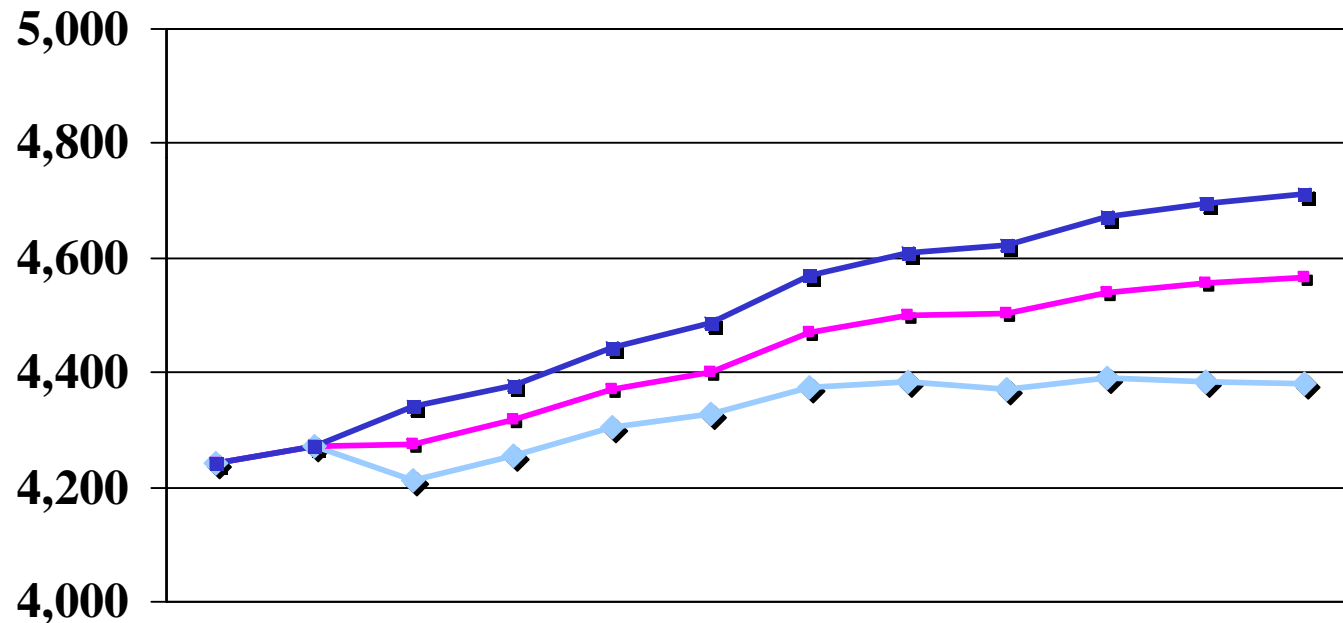


# Cautionary Note

The long range forecasts assume that changes in enrollment are equal from year to year. In reality enrollment may grow a lot in one year, a little in another, decline in another year and stay at the same level in the following year. The recommended forecast assumes a certain amount of growth between now and 2015 and between 2015 and 2020 and beyond 2020. But the actual growth in a given year may vary from the averages assumed over the course of the forecast.

It is also important to remember that these forecasts are based on the best information available at this point in time. Demographic conditions could change, and/or the assumptions guiding the forecasts could turn out to be wrong.

# Mercer Island District Forecast Alternative Forecasts 2013-2022



	Oct-11	Oct-12	Oct-13	Oct-14	Oct-15	Oct-16	Oct-17	Oct-18	Oct-19	Oct-20	Oct-21	Oct-22
Low	4,243	4,270	4,212	4,254	4,305	4,328	4,374	4,384	4,370	4,392	4,385	4,380
Medium (Recommended)	4,243	4,270	4,276	4,319	4,371	4,400	4,469	4,499	4,503	4,541	4,557	4,565
High Range Forecast	4,243	4,270	4,340	4,378	4,444	4,487	4,569	4,610	4,624	4,672	4,697	4,712

# Appendix A

Detailed Forecast Numbers  
Headcount Forecasts

**Mercer Island** (October Headcount Enrollment)

	Birth Year														
Births	<u>1993</u>	<u>1994</u>	<u>1995</u>	<u>1996</u>	<u>1997</u>	<u>1998</u>	<u>1999</u>	<u>2000</u>	<u>2001</u>	<u>2002</u>	<u>2003</u>	<u>2004</u>	<u>2005</u>	<u>2006</u>	<u>2007</u>
Mercer Island Births	168	171	140	130	167	136	121	155	132	150	126	156	143	142	175
King County Births	22355	21972	21817	21573	21646	22212	22007	22487	21778	21863	22,431	22874	22680	24244	24,899
K Enroll as % of Cnty	1.10%	1.02%	1.20%	1.11%	1.05%	1.05%	0.95%	1.11%	1.14%	1.06%	1.13%	1.00%	1.17%	1.02%	1.06%
K Enroll as a % of City	147%	132%	186%	184%	136%	171%	172%	161%	188%	155%	202%	147%	186%	174%	151%
City % of County Cohort	0.8%	0.8%	0.6%	0.6%	0.8%	0.6%	0.5%	0.7%	0.6%	0.7%	0.6%	0.7%	0.6%	0.6%	0.7%

	<u>1998</u>	<u>1999</u>	<u>2000</u>	<u>2001</u>	<u>2002</u>	<u>2003</u>	<u>2004</u>	<u>2005</u>	<u>2006</u>	<u>2007</u>	<u>2008</u>	<u>2009</u>	<u>2010</u>	<u>2011</u>	<u>2012</u>
K	247	225	261	239	227	233	208	250	248	232	254	229	266	247	264
1	304	295	259	276	257	257	260	224	283	276	267	283	280	294	277
2	291	314	306	277	291	276	259	274	227	294	294	280	304	294	311
3	334	299	330	309	276	308	282	266	290	255	306	311	305	305	310
4	335	355	314	330	309	297	330	292	275	311	281	316	339	320	331
5	320	336	360	318	332	331	301	345	306	279	320	280	328	341	322
6	329	336	362	356	316	349	341	301	353	298	282	347	282	343	362
7	329	340	350	364	368	325	359	339	304	369	304	290	346	311	348
8	353	341	349	352	369	381	340	352	343	308	365	314	305	357	320
9	333	365	343	347	354	351	392	344	343	334	336	383	320	337	362
10	379	339	350	335	343	360	355	387	346	337	341	350	393	335	339
11	280	378	340	334	343	333	364	363	379	342	348	357	358	407	336
12	<u>311</u>	<u>285</u>	<u>377</u>	<u>343</u>	<u>348</u>	<u>339</u>	<u>340</u>	<u>366</u>	<u>351</u>	<u>369</u>	<u>360</u>	<u>343</u>	<u>351</u>	<u>352</u>	<u>388</u>
Tot	<b>4145</b>	<b>4,208</b>	<b>4,301</b>	<b>4,180</b>	<b>4,133</b>	<b>4,140</b>	<b>4,131</b>	<b>4,103</b>	<b>4,048</b>	<b>4,004</b>	<b>4,058</b>	<b>4,083</b>	<b>4,177</b>	<b>4,243</b>	<b>4,270</b>

Growth	Change	63	93	-121	-47	7	-9	-28	-55	-44	54	25	94	66	27
Percent	Percent	1.5%	2.2%	-2.8%	-1.1%	0.2%	-0.2%	-0.7%	-1.3%	-1.1%	1.3%	0.6%	2.3%	1.6%	0.6%

Totals	K-5	1831	1824	1830	1749	1692	1702	1640	1651	1629	1647	1722	1699	1822	1801	1815
by	6-8	1011	1017	1061	1072	1053	1055	1040	992	1000	975	951	951	933	1011	1030
Level	9-12	1303	1367	1410	1359	1388	1383	1451	1460	1419	1382	1385	1433	1422	1431	1425

## Medium Range Forecast

			<b>Projected Births</b>										
			<u>2008</u>	<u>2009</u>	<u>2010</u>	<u>2011</u>	<u>2012</u>	<u>2013</u>	<u>2014</u>	<u>2015</u>	<u>2016</u>	<u>2017</u>	
			City Births	150	128	138	145	149	149	150	150	151	
<b>Median</b>	<b>SD+1</b>	<b>SD-1</b>	Cnty Births	25190	25057	24514	24,630	24,843	24,879	24,916	24,966	25,037	25,107
1.06%	1.13%	0.99%	% County	1.02%	0.95%	1.00%	1.02%	1.03%	1.03%	1.03%	1.03%	1.02%	1.03%
164%	186%	142%	% City	172%	187%	176%	156%	154%	154%	154%	153%	153%	152%
0.64%	0.70%	0.58%	Low	153%	168%	157%	137%	135%	135%	135%	134%	134%	133%
			High	191%	206%	195%	175%	173%	173%	173%	172%	172%	171%

### Rollup

<b>Ratio</b>	<i>Adjusted for Future K-12 Growth</i>			<b>Projections</b>										
<b>Used</b>	<b>2013-14</b>	<b>2015-20</b>	<b>Priv. Schls</b>	<b>2013</b>	<b>2014</b>	<b>2015</b>	<b>2016</b>	<b>2017</b>	<b>2018</b>	<b>2019</b>	<b>2020</b>	<b>2021</b>	<b>2022</b>	
1.07%	1.003	1.006	0.999	K	258	239	245	251	256	256	256	257	256	258
1.128	1.003	1.006	0.999	1	299	291	271	278	285	290	290	291	291	290
1.048	1.003	1.006	0.999	2	291	314	307	285	293	300	306	306	306	306
1.053	1.003	1.006	0.999	3	328	307	332	325	302	310	318	324	324	323
1.065	1.003	1.006	0.999	4	331	350	329	355	348	323	331	340	346	345
1.015	1.003	1.006	0.999	5	336	336	357	335	362	355	330	338	346	352
1.029	1.003	1.006	0.999	6	332	347	348	369	347	375	367	341	349	357
1.027	1.003	1.006	0.999	7	373	342	358	359	381	358	387	378	351	359
1.022	1.003	1.006	0.999	8	356	382	351	368	369	391	367	397	388	360
1.022	1.003	1.006	0.999	9	328	365	392	360	378	379	402	377	407	397
1.015	1.003	1.006	0.999	10	368	333	372	399	367	385	386	410	384	414
1.011	1.003	1.006	0.999	11	344	373	339	378	406	373	391	392	416	389
0.991	1.003	1.006	0.999	12	334	341	371	337	377	404	372	390	390	413
				Tot	<b>4,276</b>	<b>4,319</b>	<b>4,371</b>	<b>4,400</b>	<b>4,469</b>	<b>4,499</b>	<b>4,503</b>	<b>4,541</b>	<b>4,557</b>	<b>4,565</b>
				High Estim.	4,340	4,378	4,444	4,487	4,569	4,610	4,624	4,672	4,697	4,712
				Low Estim.	4,212	4,254	4,305	4,328	4,374	4,384	4,370	4,392	4,385	4,380
				Change	6	43	51	30	69	30	4	38	16	8
				Percent	0.2%	1.0%	1.2%	0.7%	1.6%	0.7%	0.1%	0.8%	0.3%	0.2%
Totals				K-5	1843	1837	1840	1830	1845	1834	1831	1856	1870	1874
by				6-8	1061	1070	1057	1096	1096	1124	1120	1116	1089	1076
Level				9-12	1373	1412	1474	1475	1528	1541	1551	1569	1598	1614

# Appendix B

Alternative Forecasts

Based on Total Enrollment  
and Age-Group Trends in the Census

# Alternative Forecasts

## Total Enrollment

In order to validate the accuracy of the projection model some alternative models were developed that predict total enrollment in relationship to various demographic factors. The first set of models do not provide a breakdown by grade but they do provide a way to estimate total enrollment over time and provide an alternative way to look at enrollment. These models are based on projections of the District's future population, and projections of the county K-12 population. The assumption of each model is described below and the results are presented on the following page.

Model 1; Assume enrollment is a constant percent of the District population

Model 2: Assume that the percent of the population that is school age changes over time in accordance with projected changes in the percent of the county population that is assumed to be K-12 (Using a simple cohort survival model to project K-12)

Model 3: Assume that the District's share of the county K-12 population remains relatively constant over time.

# Alternative Long Range Forecasts

The following table shows the results of the different models. The final projection model that was described in the previous sections uses a different methodology than the models presented here. Nevertheless it predicts a similar trend and provides numbers that are reasonably close to the estimates provided below, though slightly lower. Taken together these forecasts and the earlier forecast suggest that the district could see between 4500 and 4600 students by 2020.

## Long Range Projection Models of Total Enrollment

	<u>2000</u>	<u>2010</u>	<u>2015</u>	<u>2020</u>	<u>2025</u>
<b>Constant Percent of the District Pop.</b>	4,301 19.5%	4,177 18.4%	4,365 18.4%	4,553 18.4%	4,608 18.4%
<b>Percent of the District population that is K-12 changes in accordance with changes in the percent of the county population that is K-12</b>	4,301 19.5%	4,177 18.4%	4,421 18.6%	4,602 18.6%	4,604 18.4%
<b>Assume the district's share of the county K-12 population remains constant over time. (Based on K-12 county enrollment projection)</b>	4,301 1.6%	4,177 1.6%	4,400 1.6%	4,656 1.6%	4,774 1.6%
<b>Average of all the estimates</b>			<u>2015</u> 4,395	<u>2020</u> 4,604	<u>2025</u> 4,662



# Age Group Trends in the Census

Another way to look at future enrollment gains is to consider age-group trends in the census. Using data from the 1990, 2000 and 2010 Census it is possible to make some reasonable forecasts of future population growth within the District. To do this we consider the net change in five year age groups from one census to the next for the Mercer Island School District population. For example, the size of the aged 20-24 population in 2010 is compared to the size of the aged 10-14 population in 2000 to see how much growth or decline occurred over decade. Over the course of the decade some residents in a particular age group will move out, others will move in, and others will stay put, and everyone will be 10 years older. The ratio between the age groups (Aged 20-24 in 2010 divided by Age 10-14 in 2000) gives some indication of where there is growth and decline due to movement in and out of the District. The table on the following page shows these trends for Mercer Island.

Using the ratios from the past two census periods it is possible to predict future population growth. The population in a specific age group, say age 10-14, is multiplied by the appropriate change rate to predict the size of the population in ten years (Age 20-24 age group). At the lowest ages (0-4 and 5-9) growth is predicted based on the ratio of children in that age group to women in their child-bearing years using the most recent averages. And at the highest age group (Over 85 years) the population is projected based on the ratio of the 85 and over group to the number of residents ages 75 and above from the previous census. This allows us to account for changes in migration as well as the higher death rates that occur when people age.

# Population Trends from the Census

## Mercer Island School District Resident Population

### Mercer Island School District

### Rates of Change

#### Age Group Census Trends

	<u>Male</u>			<u>Females</u>			<u>Totals</u>			<u>Male Rates</u>			<u>Female Rates</u>		
	<u>1990</u>	<u>2000</u>	<u>2010</u>	<u>1990</u>	<u>2000</u>	<u>2010</u>	<u>1990</u>	<u>2000</u>	<u>2010</u>	<u>90-00</u>	<u>00-10</u>	<u>Average</u>	<u>90-00</u>	<u>00-10</u>	<u>Average</u>
0 to 4 yrs	565	530	531	516	475	478	1,081	1,005	1,009						
5 to 9 Yrs	779	840	838	670	905	727	1,449	1,745	1,565						
10-14 yrs	712	975	925	802	835	863	1,514	1,810	1,788	1.73	1.75	1.74	1.62	1.82	1.72
15-19 yrs	689	750	884	635	700	761	1,324	1,450	1,645	0.96	1.05	1.01	1.04	0.84	0.94
20-24	431	305	338	406	285	345	837	590	683	0.43	0.35	0.39	0.36	0.41	0.38
25-29	411	280	408	426	280	405	837	560	813	0.41	0.54	0.48	0.44	0.58	0.51
30-34	593	380	363	643	360	416	1,236	740	779	0.88	1.19	1.04	0.89	1.46	1.17
35-39	783	600	541	957	800	634	1,740	1,400	1,175	1.46	1.93	1.70	1.88	2.26	2.07
40-44	940	1,020	702	1,090	1,095	835	2,030	2,115	1,537	1.72	1.85	1.78	1.70	2.32	2.01
45-49	879	955	918	966	1,060	997	1,845	2,015	1,915	1.22	1.53	1.37	1.11	1.25	1.18
50-54	662	990	965	711	960	1,102	1,373	1,950	2,067	1.05	0.95	1.00	0.88	1.01	0.94
55-59	614	740	898	681	710	921	1,295	1,450	1,819	0.84	0.94	0.89	0.73	0.87	0.80
60-64	632	500	752	619	595	729	1,251	1,095	1,481	0.76	0.76	0.76	0.84	0.76	0.80
65-69	620	355	528	614	440	567	1,234	795	1,095	0.58	0.71	0.65	0.65	0.80	0.72
70-74	393	495	423	376	535	491	769	1,030	914	0.78	0.85	0.81	0.86	0.83	0.84
75-79	216	435	357	305	620	454	521	1,055	811	0.70	1.01	0.85	1.01	1.03	1.02
80-84	91	290	339	164	330	398	255	620	737	0.74	0.68	0.71	0.88	0.74	0.81
85 and over	<u>57</u>	<u>200</u>	<u>336</u>	<u>168</u>	<u>400</u>	<u>530</u>	225	600	<u>866</u>	0.55	0.36	0.46	0.63	0.39	0.51
	<b>10,067</b>	<b>10,640</b>	<b>11,046</b>	<b>10,749</b>	<b>11,385</b>	<b>11,653</b>	<b>20,816</b>	<b>22,025</b>	<b>22,699</b>						
							<i>Change</i>	<b>1,209</b>	<b>674</b>						
							<i>Percent Change</i>	<b>6%</b>	<b>3.1%</b>						
							<i>Annual Percent Change</i>	<b>0.6%</b>	<b>0.3%</b>						
Women-Child Ratios							<i>Averages</i>	<i>Male</i>	<i>Female</i>						
V 0-4	14.7%	15.9%	16.4%	12.4%	13.5%	14.1%		16.2%	13.8%						
V 5-9	19.3%	23.7%	25.6%	14.9%	23.3%	20.0%		24.7%	21.7%						

# Forecast Based on Age-Group Trends

The table on the next page shows a forecast of the resident population of the Mercer Island School District using the trends that occurred by age group between 2000 and 2010. It shows a similar trend as the previous decade and results in a gain of 1298 residents, including a gain of about 132 residents in the Age 5-19 population. Specifically it shows a big gain in the Age 5-9 population, a smaller gain in the Age 10-14 population, and a net loss in the Age 15-19 population. If we adjust this forecast to the Puget Sound Regional Council forecast, which assumes a population gain of over 2000 residents between 2010 and 2020 we get higher numbers (the adjustment uses a factor applied to every age group to adjust the bottom line total to the higher number). This forecast shows a net gain of 291 residents in the Age 5-19 group. This aligns reasonably well with our earlier forecasts which show a net gain of approximately 300 students by 2020.

All of the various forecast methods point to an increase in the school age population over time. This is consistent with what we are seeing in the birth trends, and it is consistent with forecasts from the State and OSPI which predict a net increase in the K-12 population in the coming decade.

# Forecast of the Mercer Island Resident Population Using Age-Group Trends in the Census

**Mercer Island School District**  
*Age Group Census Trends*

**Rates of Change**

**Forecast**

Based on 2000-2010 Change

	<u>Male</u>			<u>Females</u>			<u>Totals</u>			<u>Male Rates</u>					<u>Female Rates</u>					<u>Project 2020</u>			<u>Adjusted to PSRC</u>		<u>Net Change by Age Group</u>		
	<u>1990</u>	<u>2000</u>	<u>2010</u>	<u>1990</u>	<u>2000</u>	<u>2010</u>	<u>1990</u>	<u>2000</u>	<u>2010</u>	<u>90-00</u>	<u>00-10</u>	<u>Average</u>	<u>90-00</u>	<u>00-10</u>	<u>Average</u>	<u>Males</u>	<u>Females</u>	<u>Total</u>	<u>Forecast</u>	<u>Age group</u>	<u>Forecast</u>	<u>PSRC Adj</u>					
0 to 4 yrs	565	530	531	516	475	478	1,081	1,005	1,009							0 to 4 yrs	613	523	1,136	1171	0 to 4 yrs	127	162				
5 to 9 Yrs	779	840	838	670	905	727	1,449	1,745	1,565							5 to 9 Yrs	980	861	1,841	1898	5 to 9 Yrs	276	333				
10-14 yrs	712	975	925	802	835	863	1,514	1,810	1,788	1.73	1.75	1.74	1.62	1.82	1.72	10-14 yrs	927	868	1,795	1851	10-14 yrs	7	63				
15-19 yrs	689	750	884	635	700	761	1,324	1,450	1,645	0.96	1.05	1.01	1.04	0.84	0.94	15-19 yrs	882	611	1,493	1540	15-19 yrs	-152	-105				
20-24	431	305	338	406	285	345	837	590	683	0.43	0.35	0.39	0.36	0.41	0.38	20-24	321	357	677	698	20-24	-6	15				
25-29	411	280	408	426	280	405	837	560	813	0.41	0.54	0.48	0.44	0.58	0.51	25-29	481	440	921	950	25-29	108	137				
30-34	593	380	363	643	360	416	1,236	740	779	0.88	1.19	1.04	0.89	1.46	1.17	30-34	402	504	906	934	30-34	127	155				
35-39	783	600	541	957	800	634	1,740	1,400	1,175	1.46	1.93	1.70	1.88	2.26	2.07	35-39	788	917	1,705	1758	35-39	530	583				
40-44	940	1,020	702	1,090	1,095	835	2,030	2,115	1,537	1.72	1.85	1.78	1.70	2.32	2.01	40-44	671	965	1,635	1686	40-44	98	149				
45-49	879	955	918	966	1,060	997	1,845	2,015	1,915	1.22	1.53	1.37	1.11	1.25	1.18	45-49	828	790	1,618	1668	45-49	-297	-247				
50-54	662	990	965	711	960	1,102	1,373	1,950	2,067	1.05	0.95	1.00	0.88	1.01	0.94	50-54	664	840	1,504	1551	50-54	-563	-516				
55-59	614	740	898	681	710	921	1,295	1,450	1,819	0.84	0.94	0.89	0.73	0.87	0.80	55-59	863	866	1,729	1783	55-59	-90	-36				
60-64	632	500	752	619	595	729	1,251	1,095	1,481	0.76	0.76	0.76	0.84	0.76	0.80	60-64	733	837	1,570	1619	60-64	89	138				
65-69	620	355	528	614	440	567	1,234	795	1,095	0.58	0.71	0.65	0.65	0.80	0.72	65-69	641	736	1,376	1419	65-69	281	324				
70-74	393	495	423	376	535	491	769	1,030	914	0.78	0.85	0.81	0.86	0.83	0.84	70-74	636	602	1,238	1276	70-74	324	362				
75-79	216	435	357	305	620	454	521	1,055	811	0.70	1.01	0.85	1.01	1.03	1.02	75-79	531	585	1,116	1151	75-79	305	340				
80-84	91	290	339	164	330	398	255	620	737	0.74	0.68	0.71	0.88	0.74	0.81	80-84	290	365	655	675	80-84	-82	-62				
85 and over	<u>57</u>	<u>200</u>	<u>336</u>	<u>168</u>	<u>400</u>	<u>530</u>	225	600	<u>866</u>	0.55	0.36	0.46	0.63	0.39	0.51	85 and over	<u>375</u>	<u>705</u>	<u>1,080</u>	1114	85 and over	<u>214</u>	<u>248</u>				
	<b>10,067</b>	<b>10,640</b>	<b>11,046</b>	<b>10,749</b>	<b>11,385</b>	<b>11,653</b>	<b>20,816</b>	<b>22,025</b>	<b>22,699</b>							<b>11,625</b>	<b>12,372</b>	<b>23,997</b>	<b>24,742</b>	<b>Net Change</b>	<b>1,298</b>	<b>2,043</b>					
							<i>Change</i>	<b>1,209</b>	<b>674</b>								<i>Change</i>	<b>1,298</b>	<b>2043</b>								
							<i>Percent Change</i>	<b>6%</b>	<b>3.1%</b>								<i>Percent Change</i>	<b>5.7%</b>	<b>9%</b>								
							<i>Annual Percent Change</i>	<b>0.6%</b>	<b>0.3%</b>								<i>Annual Percent Change</i>	<b>0.6%</b>	<b>0.9%</b>								

## **Consultant Background and Experience**

Mr. Kendrick was the demographer for the Seattle Public schools from 1990 to 1997. In that capacity he provided enrollment projections to facilitate staffing and facilities planning and helped with the management of the student assignment system. He also provided analysis of the relationship between demographics and test scores.

Since 1997 he has worked as a consultant providing demographic analysis and enrollment projections for local school districts. Over the past 15 years his clients have included the following Districts: Bellevue, Bainbridge Island, Central Kitsap, Seattle, Tacoma, Federal Way, Mukilteo, Edmonds, Northshore, Marysville, Highline, Puyallup, Bethel, Sumner, Shoreline, Bremerton, and South Kitsap. He has worked in all 4 counties in the Puget Sound and is familiar with the different trends and patterns across the region.