

WORTHINGTON SCHOOL DISTRICT #518

ENROLLMENT PROJECTIONS

Hazel H. Reinhardt

6/15/2015

WORTHINGTON SCHOOL DISTRICT ENROLLMENT PROJECTIONS

Executive Summary

- Worthington Public School enrollment increased by 33.6 percent in the past ten years
 - Resident enrollment increased 29.9 percent
 - In 2014-15, nonresidents make up 5.2 percent of K-12 enrollment
 - The Worthington Public Schools experienced net in migration all but one year in the past ten years and Kindergarten was larger than the previous year's Grade 12 in all but one year.
 - Enrollment growth has been driven by ever larger Kindergarten classes
 - The district's estimated school age population increased as well. Today, the Worthington Public Schools capture 79.3 percent of the district's school age population

- Enrollment is projected to increase 30 to 35.7 percent in the next ten years
 - In 2024-25, projected enrollment ranges from 3,737 students to 3,898 students. This compares to 2,873 students in 2014-15
 - **For growth at this rate to occur, the district must have an increase in housing units and the job market must remain strong**

- Projections by race/ethnicity show increases in the number of White students and the number of minority students. Minority students are projected to be 71.4 percent of K-12 students in five years

- Projections for free/reduced lunch students show this student population increasing. Free/reduced meal students are projected to be 78.0 percent of K-12 students, up from 73.0 percent. In the Worthington Public Schools the free/reduced meals population is closely related to the minority population. The economy and eligibility requirements affect this population

CHAPTER 1

DISTRICT-WIDE ENROLLMENT PROJECTIONS

Introduction

In a school district, the school age population is closely related to the other population characteristics of the district. A prime example is the relationship between the age of adults and the number of births in a school district. A larger number of women of prime childbearing age results in more births and larger kindergarten classes five to six years later. Another example is the relationship between age and changing one's residence. Older people move less often than younger people. Families with children under 18 years who move from one locale to another can have an effect on school enrollment. Further, in a mobile society, enrollment changes throughout the school year as families and children move.

While population changes affect the total number of school age children residing in a school district, Minnesota students and their families have education choices. These choices also effect enrollment in the district's schools. Therefore, when analyzing public school enrollment, choice must be considered as well as population dynamics. Choice includes nonpublic schools, home schools, and the public options of open enrollment, charter schools and alternative schools. Two others choices exist: a) dropping out of high school, and b) delaying entering kindergarten.

Enrollment Trends

Enrollment in the Worthington Public Schools

Current Enrollment/Past Trends

Enrollment in the Worthington Public Schools is 722 students or 33.6 percent higher in 2014-15 than in 2005-06. Resident enrollment increased by 627 students or 29.9 percent making Worthington one of the state's rapidly growing districts. As these numbers indicate, nonresident enrollment increased. In 2014-15, nonresidents make up 5.2 percent of Worthington Public School enrollment.

TOTAL K-12 ENROLLMENT									
2005-06	2006-07	2007-08	2008-09	2009-10	2010-11	2011-12	2012-13	2013-14	2014-15
2,151	2,076	2,162	2,250	2,326	2,434	2,525	2,608	2,731	2,873

Source: Worthington School District, Fall Enrollment. Excludes Early Childhood and ALCs

To better understand enrollment change, it is important to understand the components of change. Like all population change, school enrollment change results from two different phenomena—natural increase/decrease and net migration. The difference between the size of the incoming kindergarten class and the previous year’s Grade 12, called natural increase or decrease, measures the change in past birth numbers or cohort change. For example, the Baby Boom (1946-1964) and the Baby Bust (1965-1976) set in motion cycles of rising and falling enrollment that are reflected as natural increase/decrease. As the next table shows, Worthington's kindergarten classes have been larger than the previous year’s Grade 12 every year but one. This phenomenon accounted for 538 students in the past ten years. Further, the difference between the size of the kindergarten class and the previous year’s Grade 12 is larger today than it was earlier. Natural increase has been the primary driver of enrollment growth.

COMPONENTS OF ENROLLMENT CHANGE				
Fall to Fall	Total		Natural Increase/ Decrease	Net Migration
	#	%		
2005 to 2006	-75	-3.5%	-5	-70
2006 to 2007	86	4.1%	61	25
2007 to 2008	88	4.1%	22	66
2008 to 2009	76	3.4%	70	6
2009 to 2010	108	4.6%	46	62
2010 to 2011	91	3.7%	83	8
2011 to 2012	83	3.3%	69	14
2012 to 2013	123	4.7%	85	38
2013 to 2014	142	5.2%	107	35

The other phenomenon affecting school enrollment is migration, an indirectly derived estimate. Migration is the term used when people move across a boundary or border, in this case, the school district boundary. Net migration is calculated by the progression from grade-to-grade of public school students. For example, public school Kindergarten students are moved to Grade 1 in the following year, Grade 1 students to Grade 2, etc. Because the probability of death is very low among children, the same number of students should be in the next higher grade the following year. Therefore, if the number of students changes, migration is assumed to have occurred. A positive number indicates a net flow into the public schools and a negative number reflects a net flow out of the public schools.

This method for estimating migration does not distinguish between physical movement across the district’s boundaries and education choices, such as transferring from a nonpublic school to a public school, transferring to a charter school or open enrolling in another public school outside the district. Further, students who move into or out of a school district but never enroll in the district’s public schools are not reflected in the migration numbers in this report.

Based on the described methodology, net migration was positive all but one year in the past ten years. Net migration added 184 students to the Worthington Public Schools. The combination of the net migration and the natural increase is the change in enrollment.

Student Choices in the Worthington School District

The number of education options available affects enrollment in a district's public schools. Nonpublic schools have been an option for many years. More recently, home schools became another option. Since its inception, public school options are attracting more students every year. Open enrollment allows residents of one district to attend public schools in another district. Charter schools are another public option. All these choices mean competition for students.

Nonpublic Enrollment and Home Schools

Today, nonpublic enrollment falls into two categories—traditional nonpublic schools and home schools. Most traditional nonpublic schools are associated with religious institutions and many home school curriculums also are faith based.

NONPUBLIC SETTINGS			
Year	Traditional Nonpublic Schools	Home Schools	Total
2005-06	188	18	206
2006-07	171	28	199
2007-08	164	15	179
2008-09	155	19	174
2009-10	152	18	170
2010-11	164	19	183
2011-12	168	15	183
2012-13	174	20	194
2013-14	173	21	194
2014-15	159	20	179

Source: Worthington School District

In Minnesota, 7.4 percent of all enrolled students were enrolled in traditional nonpublic schools and 1.9 percent of enrolled students were home schooled in 2013-14. In Worthington, 5.4 percent of enrolled students were in traditional nonpublic schools and 0.7 percent were home schooled.

The proportion of ISD #518 residents in nonpublic settings is lower than the statewide percentages. Combining home school students and nonpublic students, 6.1 percent of Worthington district residents were in nonpublic settings. In Minnesota, 9.2 percent were enrolled in nonpublic settings. In the past ten years, traditional nonpublic enrollment decreased statewide while home schooled children increased. In the Worthington School District, traditional nonpublic enrollment also declined. The number of home schooled students was flat in the Worthington School District.

Public Options

Open Enrollment. Open enrollment allows Minnesota students to attend public schools outside their district of residence. The application to open enroll is made by the student and his/her parents and families generally provide their own school transportation. No tuition is charged.

Some students attend public schools outside their home district because their home district enters into an agreement with another district, usually to provide specialized services. This is called a tuition agreement, but this arrangement is not technically a student choice.

Since its beginning, open enrollment has attracted more and more students statewide and in the Worthington School District. In 2013-14, 142 nonresident students enrolled into the Worthington Public Schools while 262 district residents attended public schools elsewhere through open enrollment or tuition agreements. In 2014-15, there were 150 nonresident students attending the Worthington Public Schools and 185 residents were attending school elsewhere through the open enrollment and tuition agreements.

PUBLIC OPTIONS						
Year	In	Out			Net	
	Open Enrollment	Open Enrollment	Tuition	Charter Schools		Other
2005-06	55	157	16	85	54	-203
2006-07	62	153	12	105	64	-208
2007-08	65	169	11	118	78	-233
2008-09	82	190	8	89	62	-205
2009-10	98	156	8	125	70	-191
2010-11	108	192	7	29	74	-120
2011-12	76	212	10	17	75	-163
2012-13	116	239	9	21	74	-153
2013-14	142	248	14	27	131	-147
2014-15	150	168	17	7	93	-42

Tuition students are included in open enrollment in. Charter includes online schools. Other includes the resident ALC, which is not included in the net

Source: Worthington School District.

Nonresident students who enroll in the Worthington Public Schools accounted for 5.2 percent of Worthington's total enrollment in 2013-14. Students leaving the district to attend public schools elsewhere represented 7.7 percent of the district's school age residents. In 2013-14, 7.4 percent of Minnesota students chose open enrollment.

Charter Schools. Charter schools are another public education option. While 4.7 percent of Minnesota students attended charter schools in 2013-14, only 0.8 percent of Worthington School District residents attended charter schools.

Other Public Options. Other public options include the alternative learning options. These options account for 4.1 percent of the school age population in the Worthington School District in 2013-14 and 1.3 percent of enrolled students in Minnesota.

As the education choice data show, other public options attract the largest number of students not attending the Worthington Public Schools.

K-12 Capture Rate of District School Age Residents

To estimate a capture rate, there must be an estimate of a district’s school age population or more precisely, a district’s school age population enrolled in school. A district’s enrolled population can be estimated based on resident students in the district’s schools and then adding district residents attending traditional nonpublic schools, residents being home schooled and residents opting for open enrollment out, charter schools and other public options.

Based on 2005-06 and 2014-15, the estimated resident school age population increased from 2,614 to 3,187 students, an increase of 573 students or 21.9 percent. Resident enrollment in the Worthington Public Schools increased by 627 students or 29.9 percent from 2005-06 to 2014-15. These percentages indicate that the Worthington Public Schools’ market share increased, which is atypical in Minnesota. (A capture rate is another term for market share.) Based on the estimated 2014-15 enrolled population of 3,187, the Worthington Public Schools (K-12) captured 85.4 percent of the district’s school age population. In 2005-06, the capture rate was 80.2 percent. Worthington's current market share is above average for Minnesota school districts.

WORTHINGTON SCHOOL DISTRICT ESTIMATED RESIDENT SCHOOL AGE POPULATION				
Year	Worthington Public Schools Resident Enrollment	Nonpublic Settings	Public Options	Total
2005-06	2,096	206	312	2,614
2006-07	2,014	199	334	2,547
2007-08	2,097	179	376	2,652
2008-09	2,168	174	349	2,691
2009-10	2,228	170	359	2,757
2010-11	2,326	183	302	2,811
2011-12	2,449	183	314	2,946
2012-13	2,492	194	343	3,029
2013-14	2,589	194	420	3,203
2014-15	2,723	179	285	3,187

Note: In 2014-15, Public Options and the Total may be low because open enrollment out was lower than in prior years

History of Enrollment by Grade

The history of public school enrollment contains several patterns with implications for the future. First, the kindergarten class, while fluctuating from year-to-year, increased by 57.6 percent between 2005-06 and 2014-15. The Worthington Public Schools moved to free all-day kindergarten in 2006-07. In the past three years, kindergarten size has been stable.

The number of students per grade varies in the Worthington Public Schools. A way of expressing the differences by grade is to look at the “average” number of students per grade. For example, the average elementary grade (K-5) has 238 students. The average middle school grade (6-8)

has 208 students and the average high school grade is 205 students. The middle school and high school grades reflect net inflows between Grade 6 and Grade 7 and between Grade 8 to Grade 9. These differences in average grade sizes suggest that enrollment will increase if kindergarten remains near today's level because the current distribution by grade has "built in" growth momentum.

ENROLLMENT										
Grade	2005-06	2006-07	2007-08	2008-09	2009-10	2010-11	2011-12	2012-13	2013-14	2014-15
K	158	178	204	192	220	216	239	247	255	249
1	178	144	169	197	174	220	205	233	240	265
2	154	173	135	170	182	195	219	208	228	222
3	155	146	175	149	169	195	200	223	222	241
4	141	154	150	179	155	175	194	209	224	229
5	155	145	155	163	183	161	170	198	197	224
6	146	148	151	174	158	190	160	181	204	202
7	153	159	181	163	190	166	214	190	194	217
8	190	148	166	187	166	191	178	208	189	206
9	184	190	161	179	215	176	203	190	246	211
10	202	170	194	166	180	209	170	202	191	239
11	152	178	151	181	164	184	195	149	199	187
12	183	143	170	150	170	156	178	170	142	181
Total	2,151	2,076	2,162	2,250	2,326	2,434	2,525	2,608	2,731	2,873

Source: Worthington School District, Fall Enrollment. Excludes Early Childhood and ALC

Minnesota's largest graduating high school class since 1978 graduated in 2009. State wide, graduating classes will be getting smaller. Based on Worthington's enrollment history, Worthington's largest recent senior class has not yet graduated.

Enrollment Projections

Projection Background

Some factors affecting future school enrollment are known. However, other important factors are less clear. First, the trends around which there is confidence.

Trends Where Confidence is High

- Aging. The population in the U.S. and Minnesota is aging. By 2020, 16-17 percent of Minnesota's population will be 65 years old or older. In 2010, the elderly made up 12.9 percent of the population. There is no historical precedent for this high proportion of older population; therefore, society is entering uncharted waters as to the effects of this change. However, we know that aging will affect the housing market and reduce geographic mobility because older people move less frequently than younger people.

- Decrease in the school age population per household. From 2000 to 2010, the number of school age children per household decreased sharply as Baby Boomer households empty nested and started to “age in place.” After 2010, households with children will be headed primarily by Generation X parents who are members of a much smaller generation. Gen X (1965-1976) is only 60 percent the size of the Baby Boom (1946-1964) generation, which means the percentage of households with 5-17 year-olds will continue to decrease but more slowly.
- Shift in size of key adult age groups. The size of the Baby Boom generation and the Baby Bust generation will result in significant changes in the size of adult age groups, which in turn will affect the demand for new housing units. The modest increase in the 20-34 year-old population between 2010 and 2020 is especially significant for the demand for “first” homes (including apartments) and the decrease in 35-54 year-olds will affect the “move up” market. Growth in the 55+ year-old markets will create demand for housing for mature adults and seniors; however, these units will not yield school age children.

These population changes by age point to a future very different from the recent past. Demand for additional housing will slow because the adult population age 20+ will increase more slowly and the 35-54 year-old age group that helped fuel the housing boom will decrease from 2010-2020. Furthermore, 60 percent of the increase in adults 20 years of age and older will be persons 65+ years of age. There may be more sellers than buyers in the housing market.

- Fertility. Today, completed fertility is near the replacement level. Completed fertility refers to the number of children born per woman throughout her childbearing years. In Minnesota, White non-Hispanic women have below replacement fertility. (Replacement is 2.11 children per female at the end of childbearing.) Fertility rates for Asian and Hispanic women are now near replacement. Black women (African-American and African-born) have the highest fertility level, just below 3, that is, just less than 3 children per woman at the end of childbearing.

RESIDENT LIVE BIRTHS			
Calendar Year	Minnesota	Nobles County	Worthington City
1999	65,953	291	184
2000	67,451	269	179
2001	66,617	311	192
2002	68,037	298	211
2003	70,053	327	221
2004	70,614	337	239
2005	70,920	314	213
2006	73,515	344	247
2007	73,675	366	261
2008	72,382	362	253
2009	70,617	352	244
2010	68,407	387	280
2011	68,416	351	260
2012	68,783	336	239
2013	69,183	372	254

Source: Minnesota Department of Health

- Births. Births fell after 1990 in the U.S. and in Minnesota; however, beginning in 2003 through 2007, births increased. In 2007, births were higher than at any time since 1964; however, 2007 births were well below the peak Minnesota birth year of 1959 (88,000 resident births). In 2008, 2009, 2010 and 2011, births fell in the U.S. and Minnesota, although in Minnesota, births were flat between 2010 and 2011 (+9 births). These declines are attributed to the poor economy and are the result of the decline in the fertility rates of women of color. In 2012 and 2013, Minnesota resident births increased.

As the history of resident births shows, from 1999 to 2013, resident births in Minnesota increased 4.9 percent while resident births in Nobles County increased 27.8 percent. In Worthington City, resident births increased 38.0 percent.

- Enrollment cycles. Births will increase again and a third enrollment cycle will occur in the first half of this century. Already, kindergarten classes are increasing in some districts, a sign of the beginning of this third enrollment cycle. The end of the third enrollment cycle is projected to be around 2040. (From start to finish, these cycles last about 30 years.)

Unknowns

The unknowns reflect recent changes such as the collapse of the housing market and tighter credit. Another unknown is the longer-term effect of the recession on domestic migration and international immigration, especially in a slow recovery. Furthermore, will attitude and behavior changes prompted by the recession, especially delayed marriage and lower fertility, continue?

- Collapse of the housing market and tighter credit. A high level of mobility was possible with a robust housing market with rapid appreciation and easy credit. This changed with the collapse of the housing market and tighter credit. Recently, however, home prices have been increasing and new construction is occurring.
- The recession. Although the recession is officially over, the sluggish job market slowed population movement between and within states. Minnesota felt the effect of this change as fewer young and middle-aged adults moved to Minnesota slowing population growth. Today, Minnesota is outpacing the nation in job growth, but the economy has not returned to its pre-recession level. The recession also increased public school enrollment as some families decided that nonpublic schools were beyond their current financial resources. Further, births to women of color and, hence, their fertility rates, dropped significantly. Whether lower fertility will continue for these women is unclear.

Cohort Survival Method

The most common and most robust model for projecting school enrollment is the cohort survival method. The first step in the cohort survival method is aging the population. In a standard cohort survival model, aging the population involves estimating the number of deaths expected in an age group before it reaches the next older age group. When the cohort survival method is used to project school enrollment, the first step is to move a grade to the next higher grade. However, because mortality is so low in the school age population, the entire grade is assumed to “survive” to the next higher grade in the following year.

Once a grade or cohort has been “aged” to the next grade, net migration is added to or subtracted from that grade. Using survival rates accomplishes both “aging” and migration in a single step. Over time, the size of a cohort will increase or decrease as a result of migration as its progresses through the grades. For example, the 2005-06 kindergarten class had 158 members. This same cohort had 211 members in Grade 9 in 2014-15.

The projection of future kindergarten class size is important in long-term enrollment projections because these students will be in school over the life of the projection. If a school census exists, it is a resource for short-term kindergarten projections, i.e., a couple of years. However, school censuses are notoriously inaccurate for children less than four years of age, in part, because the preschool population is more mobile than the school age population.

To project kindergarten, the best theoretical approach, but the least practical, is to project births based on the age of the female population. These birth projections then must be survived to age five and then adjusted for migration to yield kindergarten projections. Determining the age of females in a school district is the first challenge, and then many assumptions must be made, making this approach impractical.

A simpler approach is to use resident births as a proxy for kindergarten five years later. Of course, not every child born in the district will enter the district's kindergarten classes five to six years later. However, some "native born" children who move out before enrolling in kindergarten will be replaced by children born elsewhere who move into the district before entering kindergarten. If the number of "ins" and "outs" are equal, the net effect is zero and the kindergarten class would be 100 percent of resident births. However, no public school system captures all its potential. Some resident kindergarten students attend private schools or are home schooled. Others may attend a charter school or open enroll at another district. Therefore, a public school's kindergarten to birth ratio is expected to be less than 100 percent. If the ratio is 100 percent or higher, more preschool children are moving into or open enrolling into the district than leaving (net in migration).

If births are used as a kindergarten proxy, kindergarten projections are available for only a few years into the future. To extend kindergarten projections another five years, Worthington's kindergarten will be projected based on the Minnesota Demographic Center's projection of state births and Nobles County's 0-4 year old population.

Kindergarten Assumptions

Upon special request, the Minnesota Department of Health will provide resident births by address so births can be geocoded to a school district's boundaries. However, “out-of-wedlock” births may be withheld because unmarried parents can choose whether to make birth information by address public. This policy results in some under reporting. Therefore, the advantage of an additional year of data is negated by the issues resulting from underreporting. Nobles County births will be used instead.

County births, based on a calendar year, must be adjusted to the school year. As a rule of thumb, about one-third of births occur in the last third of a calendar year. This means that about one-third of the kindergarten class is born six years earlier not five years earlier. For example, one-third of the 2014-15 kindergarten class was born in 2008 and two-thirds were born in 2009. Adjusting birth years to fit the age requirements of kindergarten creates a kindergarten pool.

The Worthington kindergarten pool uses Nobles County resident births as a proxy. With county birth data available through 2013, kindergarten classes through 2018-19 can be projected from actual births.

WORTHINGTON'S KINDERGARTEN AS A PERCENTAGE OF THE COUNTY KINDERGARTEN POOL			
Birth Years	County Kindergarten Pool	Percentage	Kindergarten Year
1999; 2000	276	57.2%	2005-06
2000; 2001	297	59.9%	2006-07
2001; 2002	303	67.3%	2007-08
2002; 2003	317	60.6%	2008-09
2003; 2004	334	65.9%	2009-10
2004; 2005	321	67.3%	2010-11
2005; 2006	334	71.6%	2011-12
2006; 2007	359	68.8%	2012-13
2007; 2008	364	70.1%	2013-14
2008; 2009	355	70.1%	2014-15
2009; 2010	375		2015-16
2010; 2011	363		2016-17
2011; 2012	341		2017-18
2012; 2013	360		2018-19

The above table shows Worthington’s kindergarten as a percentage of the county pool. In the past ten years, Worthington’s kindergarten class as a percentage of the pool fluctuated but increased. Since 2011-12, the percentage has been relatively stable. When rates are averaged, a more stable trend appears. (Calculating an average of the kindergarten to birth ratio for two or more years smooth out annual fluctuations and produce more “typical” ratio for that period.) The average of the past four years is 70.2 percent. The highest percentage was 71.6. If the percentage of county births increases, it could average 72.0 percent in the future.

For enrollment projections, a 72.0 percentage will be used as the high kindergarten assumption and the average of the past four years (70.2 percent) will be used as the low kindergarten assumption.

To extend kindergarten projections beyond 2018-19, projected Minnesota resident births (0-year olds) will be used as a guide. These data present a complication because of the large gap between 2013 resident births (69,183) and the 2014 projection of 0-year olds (74,107). To avoid an abrupt increase in a single year, births were slowly increased from 2013 actual births to the 2020 projection of 74,282.

Nobles County’s resident births were 0.49 percent to 0.57 percent of Minnesota resident births since 2007. The most recent percentage was 0.54. At 0.54 percent of Minnesota resident births, Nobles County would have 401 resident births in 2020. Because Nobles County’s births are such a small percentage of Minnesota births, using the projection of 0-4 year olds for Nobles County is a more logical guide. The projections for Nobles County 0-4 year-olds show this population increasing by 4.7 percent from 2010 to 2020. This percentage increase applied to the 2010 resident births results in a projection

of 405 county resident births in 2020. The two projections of 2020 births are similar. Births will be increased in regular increments to the 2020 projected level. Then these resident birth projections will be converted into a kindergarten pool.

MINNESOTA 0-YEAR OLDS	
Year	Number
2014	74,107
2015	74,201
2016	74,258
2017	74,290
2018	74,278
2019	74,279
2020	74,282

Source: Minnesota Demographic Center

NOBLES COUNTY 0-4 YEAR-OLDS				
	2010	2015	2020	2025
Total	1,697	1,713	1,775	1,826
One year (1/5)	339	343	355	365

Source: Minnesota Demographic Center

KINDERGARTEN POOL	
Year	County
2015-16	375
2016-17	363
2017-18	341
2018-19	360
2019-20	376
2020-21	382
2021-22	387
2022-23	392
2023-24	398
2024-25	403

Applying the kindergarten to birth ratio to the projected kindergarten pool results in kindergarten projections. The low kindergarten projection results in 2,651 kindergarten students over ten years while the high projection produces 2,720 kindergarten students over ten years. This compares with 2,158 kindergarten students over the past ten years.

KINDERGARTEN PROJECTIONS		
Year	District Pool	
	@70.2%	@72.0%
2014-15	249	249
2015-16	263	270
2016-17	255	261
2017-18	239	246
2018-19	253	259
2019-20	264	271
2020-21	268	275
2021-22	272	279
2022-23	275	282
2023-24	279	287
2024-25	283	290
Total	2,651	2,720

Through 2018-19, the kindergarten projections are based on actual births. The large Gen Y population will begin to enter its prime childbearing years after 2015. This means the kindergarten pool should increase. As the pool increases, so will the size of the kindergarten classes.

Net Migration Assumptions

The concept and method of calculating migration was explained earlier in this report. However, the limitations of the methodology are worth repeating. The method of calculating migration does not distinguish between physical movement across a district's boundaries and education choices, such as transferring from a nonpublic school to a public school, transferring to a charter school or open enrolling in another public school. Further, students who move into or out of a school district but never enroll in the district's public schools are not reflected in the migration numbers in this report.

In the past ten years, annual net migration fluctuated from year to year but was positive for all but one year.

The next table shows net migration aggregated by the elementary grades (Kindergarten-Grade 5), the middle school grades (6-8) and the high school grades. Kindergarten to Grade 5 net migration was negative more often than it was positive. The number of net migrants vary significantly from year to year suggesting a high turnover in the population. At the middle school grades, net migration was positive every year. The high school grades experienced net out migration more years than not.

NET MIGRATION SCHOOL YEAR TO SCHOOL YEAR									
	05 to 06	06 to 07	07 to 08	08 to 09	09 to 10	10 to 11	11 to 12	12 to 13	13 to 14
K-5	-24	-11	25	-24	46	-13	14	-9	12
6-8	1	46	37	14	16	35	35	18	30
9-12	-47	-10	4	16	0	-14	-35	29	-7
Total	-70	25	66	6	62	8	14	38	35

Net in migration between Kindergarten and Grade 1 is typical in Minnesota's public schools, although this may change with free all-day kindergarten. In the Worthington Public Schools, net migration between Kindergarten and Grade 1 has been negative nearly every year suggesting high turnover. The progression from grade to grade in the remaining elementary grades fluctuates but is mixed. There is a consistent net in migration between Grade 6 and Grade 7, although the number fluctuates widely. Like many other Minnesota public schools, there is a net inflow between Grade 8 and Grade 9 when nonpublic students transfer into the public schools. However, this number also fluctuates. After Grade 10, the high school grades show losses nearly every year, especially between Grade 10 and Grade 11 and Grade 11 and Grade 12, again a typical pattern.

NET MIGRATION BY GRADE SCHOOL YEAR TO SCHOOL YEAR									
	05 to 06	06 to 07	07 to 08	08 to 09	09 to 10	10 to 11	11 to 12	12 to 13	13 to 14
K to 1	-14	-9	-7	-18	0	-11	-6	-7	10
1 to 2	-5	-9	1	-15	21	-1	3	-5	-18
2 to 3	-8	2	14	-1	13	5	4	14	13
3 to 4	-1	4	4	6	6	-1	9	1	7
4 to 5	4	1	13	4	6	-5	4	-12	0
5 to 6	-7	6	19	-5	7	-1	11	6	5
6 to 7	13	33	12	16	8	24	30	13	13
7 to 8	-5	7	6	3	1	12	-6	-1	12
8 to 9	0	13	13	28	10	12	12	38	22
9 to 10	-14	4	5	1	-6	-6	-1	1	-7
10 to 11	-24	-19	-13	-2	4	-14	-21	-3	-4
11 to 12	-9	-8	-1	-11	-8	-6	-25	-7	-18
Total	-70	25	66	6	62	8	14	38	35
Percent	-3.3	1.2	3.1	0.3	2.7	0.3	0.6	1.5	1.3

For making projections, migration is converted into survival rates. Survival rates show the percentage change from grade to grade each year. For example, 1.000 indicates no change or 100 percent of the grade progressed to the next highest grade. Any number over 1.000 reflects the percentage increase while a number below 1.000 reflects the percentage decrease. For example, 0.98 indicates a 2 percent decrease.

SURVIVAL RATES SCHOOL YEAR TO SCHOOL YEAR									
	05 to 06	06 to 07	07 to 08	08 to 09	09 to 10	10 to 11	11 to 12	12 to 13	13 to 14
K to 1	0.911	0.949	0.966	0.906	1.000	0.949	0.975	0.972	1.039
1 to 2	0.972	0.938	1.006	0.924	1.121	0.995	1.015	0.979	0.925
2 to 3	0.948	1.012	1.104	0.994	1.071	1.026	1.018	1.067	1.057
3 to 4	0.994	1.027	1.023	1.040	1.036	0.995	1.045	1.004	1.032
4 to 5	1.028	1.006	1.087	1.022	1.039	0.971	1.021	0.943	1.000
5 to 6	0.955	1.041	1.123	0.969	1.038	0.994	1.065	1.030	1.025
6 to 7	1.089	1.223	1.079	1.092	1.051	1.126	1.188	1.072	1.064
7 to 8	0.967	1.044	1.033	1.018	1.005	1.072	0.972	0.995	1.062
8 to 9	1.000	1.088	1.078	1.150	1.060	1.063	1.067	1.183	1.116
9 to 10	0.924	1.021	1.031	1.006	0.972	0.966	0.995	1.005	0.972
10 to 11	0.881	0.888	0.933	0.988	1.022	0.933	0.876	0.985	0.979
11 to 12	0.941	0.955	0.993	0.939	0.951	0.967	0.872	0.953	0.910

COMPARISON OF SURVIVAL RATES AVERAGED			
Grade	Past 8 years	Past 4 years	Past 2 years
K to 1	0.970	0.984	1.006
1 to 2	0.988	0.979	0.952
2 to 3	1.044	1.042	1.062
3 to 4	1.025	1.019	1.018
4 to 5	1.011	0.984	0.972
5 to 6	1.036	1.029	1.028
6 to 7	1.112	1.113	1.068
7 to 8	1.025	1.025	1.029
8 to 9	1.101	1.107	1.150
9 to 10	0.996	0.985	0.989
10 to 11	0.951	0.943	0.982
11 to 12	0.943	0.926	0.932

One of the advantages of the cohort survival method is that it produces projections for every grade, which requires migration assumptions for every grade. At first glance, the rates look similar. However, the average of survival rates for the past eight years results in the highest projection in ten years. The averages of the past four years and the past two years result in the lowest projections. However, these two projections differ by only 12 students in ten years. To reflect possibilities, two migration assumptions were constructed. The desired outcome was a low end and a high end of recent experience. The average of the past two years will be the low assumption and the average of the past eight years will be the high assumption.

Because net migration will be projected based on survival rates by grade, the percentage change will be the same each year while the actual number of students added or subtracted by grade may change from year to year.

PROJECTED SURVIVAL RATES		
Grade	Low (Past 2 Years)	High (Past 8 Years)
K to 1	1.006	0.970
1 to 2	0.952	0.988
2 to 3	1.062	1.044
3 to 4	1.018	1.025
4 to 5	0.972	1.011
5 to 6	1.028	1.036
6 to 7	1.068	1.112
7 to 8	1.029	1.025
8 to 9	1.150	1.101
9 to 10	0.989	0.996
10 to 11	0.982	0.951
11 to 12	0.932	0.943

Projection Results

The kindergarten and net migration assumptions are trend lines, which remove annual fluctuations. However, the future, like the past, will be characterized by annual fluctuation, sometimes large. Because there is no reasonable way to forecast when fluctuations around trend lines will occur, it is arbitrary to project them. Furthermore, long-term projections are designed to approximate a future point in time not to yield the best projection for each intervening year between the present and the projection end date. For this reason, long-term projections should not be used for annual budgeting purposes. The district should continue to use its version of the cohort survival methodology for annual enrollment projections.

Four cohort projections are shown in the next table. In ten years, there is a 161 student difference between the lowest projection and the highest projection. The migration assumptions account for an 87-88 student difference in ten years. The kindergarten assumptions account for a 73-74 student difference in the ten years. In these projections, the migration assumptions have a bigger effect on the difference among the projections than the kindergarten assumptions. All the projections show the effect of larger kindergarten classes; however, there is more enrollment growth in the first five projection years than in the second five projection years.

The lowest projection is based on the low kindergarten and low migration assumptions. In this projection, enrollment increases by 864 students by 2024-25 or 30.1 percent. In five years, enrollment increases to 3,385 students, which is 512 students higher than in 2014-15.

The highest projection, based on the high kindergarten and high migration assumptions, shows an enrollment increase of 1,025 students or 35.7 percent between 2014-15 and 2024-25. In five years, enrollment increases by 596 students.

In between the highest and lowest projections are two other projections. In 2024-25, these two projections differ by 14 students. As a group, the four projections reflect a range of possibilities with all four showing enrollment increasing.

ENROLLMENT PROJECTIONS				
Year	Low K Low Mig	High K Low Mig	Low K High Mig	High K High Mig
2014-15	2,873	2,873	2,873	2,873
2015-16	2,993	3,000	2,996	3,003
2016-17	3,116	3,129	3,123	3,135
2017-18	3,180	3,199	3,199	3,218
2018-19	3,288	3,314	3,319	3,345
2019-20	3,385	3,418	3,436	3,469
2020-21	3,469	3,510	3,544	3,584
2021-22	3,556	3,604	3,643	3,690
2022-23	3,621	3,676	3,716	3,771
2023-24	3,686	3,750	3,779	3,844
2024-25	3,737	3,810	3,824	3,898

Excludes Early Childhood and ALC

Looking at the projections based on the elementary, middle school and high school grades is instructive. K-5 enrollment increases throughout the projection period based on ever larger kindergarten classes. For the first five projection years, virtually all of these kindergarten students have already been born. Therefore, elementary enrollment growth is almost certain in the first five projection years unless there is an economic disruption or more competition in the Worthington School District.

ENROLLMENT PROJECTIONS				
	K-5	6-8	9-12	Total
2014-15	1,430	625	818	2,873
2019-20				
Low K/Low Mig	1,530	798	1,057	3,385
High K/Low Mig	1,563	798	1,057	3,418
Low K/High Mig	1,521	865	1,050	3,436
High K/High Mig	1,554	865	1,050	3,469
2024-25				
Low K/Low Mig	1,647	816	1,275	3,737
High K/Low Mig	1,690	837	1,284	3,810
Low K/High Mig	1,638	869	1,317	3,824
High K/High Mig	1,681	892	1,326	3,898

Excludes Early Childhood and ALC

Middle school enrollment increases in the first five projection years and then continues to increase as the larger elementary grades age into middle school in the last five projection years. In the

second five projection years, the kindergarten assumptions effect the middle school projections but in the first five years only the migration assumptions are effecting the size of the middle schools grades.

High school enrollment is projected to increase as well throughout the projection period. The kindergarten assumptions have only a small effect on the high school projections.

In 2024-25, the 2014-15 kindergarten class will be in Grade 10, which means that all the grades below Grade 10 are products of the projection assumptions. Detailed grade by year projections are at the end of this report.

Housing Unit Method

The housing unit method provides another way of projecting population and school enrollment. While the number of dwelling units (housing units) is related to the number of school age children, dwelling units alone do not determine the number of school age children. The number of school age children per unit is also a key variable in the projection equation.

The chief reason to use the housing unit method is to understand the effect of additional housing units on enrollment. It could be said that housing stock is like DNA. It determines the size and characteristics of the resident school age population.

After dwelling unit type, the year built and the market value emerge as the most important housing characteristics. Year built reflects how families lived in a particular era and is a proxy for square feet and characteristics such as number of bedrooms, number of bathrooms and number of garage spaces. The presence of a master suite, walk-in closets, etc. can also be inferred from year built. Value implies some of these same characteristics plus lot size, location and interior amenities such as kitchen and bathroom appointments and finishes.

The relationship between housing unit characteristics and student numbers and characteristics has been established by work in three states. Findings based on school districts in three states follow.

- *Dwelling unit type affects the school age child per unit yield. Single-family detached units have the highest school age child yield per unit. Single-family attached, such as townhouses, have significantly fewer children per unit than single-family detached units, while apartment units have even fewer school age children per unit, although there are some local exceptions.*
- *Newer single-family detached units yield more students per unit than older single-family detached units.*
- *As single-family detached units sell (turnover), student yield per unit usually increases in the newer units. In older units, yield may decrease.*
- *The market value of single-family detached units affects the school age child per unit yield. Moderately priced to higher priced units yield more students per unit than the lowest priced units.*
- *As the population ages, more dwelling units are being built for mature adults (55+ years) and for seniors. These units will have zero school age children per unit.*

Projections

In the Worthington School District, the increase in housing stock has not kept pace with the growth in population resulting in a much higher persons per household than the state average. A study conducted by Viewpoint Consulting Group in 2012-13, estimated that there is demand for approximately 500 new housing units in Worthington City between 2013 and 2020. Most of that demand will be for rental and senior units. It is clear that unless there is an increase in housing stock in the Worthington School District, the cohort method enrollment projections will not be realized.

CHAPTER 2

SPECIAL POPULATIONS

Chapter 2 focuses on several special populations that are subsets of total enrollment. Some of these special populations experience changes in eligibility or funding that can affect the number of students served. This makes accurately projecting these populations difficult. The special populations covered in this chapter include White students, minority students, and free and reduced meal students. Basic data about these populations are in the Appendix.

The cohort survival method will be used to project the special student populations. This method was described in detail in Chapter 1. The high kindergarten projections will be used for all the special population projections. (In five years, there is a seven student difference between the low and high kindergarten projections.) Each special population group's kindergarten will be based on the trend in that group's kindergarten share. Projecting future shares, however, is more complex than it might appear because shares have fluctuated in the past five years. For net migration, the survival rates based on the average of the past two years, which is similar to the district-wide low migration assumption, will be used for the special population projections.

Race/Ethnicity

For this analysis, students will be classified as White or Minority. White enrollment increased by five students or 0.5 percent in the past five years. During the same period, minority enrollment increased by 434 students or 29.3 percent. White kindergarten classes are smaller than the previous year's Grade 12, and the number of White students in the elementary grades is smaller than in the higher grades. These two phenomena have resulted in no growth in the White student population. Minority enrollment increased primarily as a result of larger kindergarten classes than the previous years' Grade 12 and some net in migration. (See Appendix)

K-12 ENROLLMENT BY RACE/ETHNICITY					
	2010-11	2011-12	2012-13	2013-14	2014-15
White	951	962	939	932	956
Minority	1,483	1,563	1,669	1,799	1,917
Total	2,434	2,525	2,608	2,731	2,873

Source: Worthington School District. Excludes Early Childhood and ALC

The White share of kindergarten students has fluctuated but is much lower than it was five years ago. In light of this pattern, the White share of kindergarten students was reduced another 1 percentage point every year through 2018-19.

Survival rates based on the average of the past two years were used for both the White and minority grade progressions.

The sum of the two kindergarten classes always equals the district-wide high kindergarten projection. Other grades, however, were not controlled to the district-wide total for that grade. In 2019-20, the sum of the White and minority projections (3,411) is very similar to the high kindergarten/high migration district-wide total of 3,418. Changes in kindergarten shares could change these projections as could changes in the migration rates.

As the following table shows, White enrollment increases and the rate of change is greater than in the past five years. However, the White share of total enrollment decreases. Minority enrollment is projected to grow at a slower rate than in the past five years. In 2019-20, 71.4 percent of the students in the Worthington Public Schools are projected to be minority students.

KINDERGARTEN SHARE BY RACE/ETHNICITY		
Historic Shares	White	Minority
2010-11	29.2%	70.8%
2011-12	31.8%	68.2%
2012-13	27.1%	72.9%
2013-14	25.5%	74.5%
2014-15	22.1%	77.9%
Projected Shares		
2015-16	21.1%	78.9%
2016-17	20.1%	79.9%
2017-18	19.1%	80.9%
2018-19	18.1%	81.9%
2019-20	18.1%	81.9%

RACE/ETHNICITY		
	White	Minority
2014-15	956	1,917
2019-20	971	2,440
Change		
2010-11 to 2014-15	0.5%	29.3%
2014-15 to 2019-20	1.6%	27.3%
Percent Distribution		
2014-15	33.3%	66.7%
2019-20	28.4%	71.4%

Free/Reduced Meals

The free/reduced meals population increased by 37.1 percent in the past five years. The number of free/reduced meals population increased every year with the largest number of students occurring in 2014-15. The improving economy could reduce this population in the future and this population is subject to changes in eligibility.

K-12 ENROLLMENT BY FREE AND REDUCED MEALS					
	2010-11	2011-12	2012-13	2013-14	2014-15
Students	1,529	1,676	1,752	1,901	2,097

Source: Worthington School District. May include Early Childhood and ALC

The free/reduced meals kindergarten share has increased every year. Given this trend, the share will continue to be increased throughout the projection period. Projections based on the high kindergarten and the average of the past two years' survival rates show an increase in the free/reduced meals population from 2,097 students to 2,667 students in five years. Even with a decrease in the rate of change, 78.0 percent of students will be in the free/reduced meals population in five years. The number of free/reduced meals students is closely related to the number of minority students but an improved economy could reduce this number.

KINDERGARTEN SHARE OF FREE/REDUCED MEALS	
Historic Shares	
2010-11	72.7%
2011-12	73.2%
2012-13	74.1%
2013-14	75.3%
2014-15	83.1%
Projected Shares	
2015-16	83.6%
2016-17	84.1%
2017-18	84.6%
2018-19	85.1%
2019-20	85.1%

FREE/REDUCED MEALS	
2014-15	2,097
2019-20	2,667
Change	
2010-11 to 2014-15	37.1%
2014-15 to 2019-20	27.2%
Percent Distribution	
2014-15	73.0%
2019-20	78.0%

K-12 ENROLLMENT BY RACE/ETHNICITY AND FREE/REDUCED MEALS						
	2014-15	2015-16	2016-17	2017-18	2018-19	2019-20
White	956	970	977	958	959	971
Minority	1,917	2,032	2,151	2,235	2,344	2,440
Sum	2,873	3,002	3,128	3,193	3,303	3,411
District wide	2,873	3,000	3,129	3,199	3,314	3,418
Difference	0	+2	-1	-6	-11	-7
Free/Reduced	2,097	2,211	2,334	2,420	2,544	2,667

Excludes Early Childhood and ALC

APPENDIX

WORTHINGTON PUBLIC SCHOOL WHITE ENROLLMENT					
Grade	2010-11	2011-12	2012-13	2013-14	2014-15
K	63	76	67	65	55
1	64	60	73	67	71
2	59	71	59	67	62
3	74	59	67	64	71
4	59	69	63	71	66
5	54	55	74	62	71
6	72	52	52	72	66
7	67	89	71	62	88
8	83	72	85	72	65
9	72	83	74	91	78
10	95	74	82	75	93
11	98	100	70	85	85
12	91	102	102	79	85
Total	951	962	939	932	956

WORTHINGTON PUBLIC SCHOOLS WHITE NET MIGRATION Fall to Fall				
Grade	2010 to 2011	2011 to 2012	2012 to 2013	2013 to 2014
K-5	-5	1	2	7
6-8	20	12	9	23
9-12	11	-1	19	18
Total	26	12	30	48

WORTHINGTON PUBLIC SCHOOLS WHITE NET MIGRATION BY GRADE Fall to Fall				
Grade	2010 to 2011	2011 to 2012	2012 to 2013	2013 to 2014
K to 1	-3	-3	0	6
1 to 2	7	-1	-6	-5
2 to 3	0	-4	5	4
3 to 4	-5	4	4	2
4 to 5	-4	5	-1	0
5 to 6	-2	-3	-2	4
6 to 7	17	19	10	16
7 to 8	5	-4	1	3
8 to 9	0	2	6	6
9 to 10	2	-1	1	2
10 to 11	5	-4	3	10
11 to 12	4	2	9	0
Total	26	12	30	48

WORTHINGTON PUBLIC SCHOOLS WHITE SURVIVAL RATES Fall to Fall				
Grade	2010 to 2011	2011 to 2012	2012 to 2013	2013 to 2014
K to 1	0.952	0.961	1.000	1.092
1 to 2	1.109	0.983	0.918	0.925
2 to 3	1.000	0.944	1.085	1.060
3 to 4	0.932	1.068	1.060	1.031
4 to 5	0.932	1.072	0.984	1.000
5 to 6	0.963	0.945	0.973	1.065
6 to 7	1.236	1.365	1.192	1.222
7 to 8	1.075	0.955	1.014	1.048
8 to 9	1.000	1.028	1.071	1.083
9 to 10	1.028	0.988	1.014	1.022
10 to 11	1.053	0.946	1.037	1.133
11 to 12	1.041	1.020	1.129	1.000

WORTHINGTON PUBLIC SCHOOL MINORITY ENROLLMENT					
Grade	2010-11	2011-12	2012-13	2013-14	2014-15
K	153	163	180	190	194
1	156	145	160	173	194
2	136	148	149	161	160
3	121	141	156	158	170
4	116	125	146	153	163
5	107	115	124	135	153
6	118	108	129	132	136
7	99	125	119	132	129
8	108	106	123	117	141
9	104	120	116	155	133
10	114	96	120	116	146
11	86	95	79	114	102
12	65	76	68	63	96
Total	1,483	1,563	1,669	1,799	1,917

WORTHINGTON PUBLIC SCHOOLS MINORITY NET MIGRATION Fall to Fall				
Grade	2010 to 2011	2011 to 2012	2012 to 2013	2013 to 2014
K-5	-8	13	-11	5
6-8	15	23	9	7
9-12	-25	-34	10	-25
Total	-18	2	8	-13

WORTHINGTON PUBLIC SCHOOLS MINORITY NET MIGRATION BY GRADE Fall to Fall				
Grade	2010 to 2011	2011 to 2012	2012 to 2013	2013 to 2014
K to 1	-8	-3	-7	4
1 to 2	-8	4	1	-13
2 to 3	5	8	9	9
3 to 4	4	5	-3	5
4 to 5	-1	-1	-11	0
5 to 6	1	14	8	1
6 to 7	7	11	3	-3
7 to 8	7	-2	-2	9
8 to 9	12	10	32	16
9 to 10	-8	0	0	-9
10 to 11	-19	-17	-6	-14
11 to 12	-10	-27	-16	-18
Total	-18	2	8	-13

WORTHINGTON PUBLIC SCHOOLS MINORITY SURVIVAL RATES Fall to Fall				
Grade	2010 to 2011	2011 to 2012	2012 to 2013	2013 to 2014
K to 1	0.948	0.982	0.961	1.021
1 to 2	0.949	1.028	1.006	0.925
2 to 3	1.037	1.054	1.060	1.056
3 to 4	1.033	1.035	0.981	1.032
4 to 5	0.991	0.992	0.925	1.000
5 to 6	1.009	1.122	1.065	1.007
6 to 7	1.059	1.102	1.023	0.977
7 to 8	1.071	0.984	0.983	1.068
8 to 9	1.111	1.094	1.260	1.137
9 to 10	0.923	1.000	1.000	0.942
10 to 11	0.833	0.923	0.950	0.879
11 to 12	0.884	0.716	0.797	0.842

WORTHINGTON PUBLIC SCHOOL FREE/REDUCED MEALS ENROLLMENT					
Grade	2010-11	2011-12	2012-13	2013-14	2014-15
K	157	175	183	192	207
1	143	144	167	176	210
2	137	162	143	171	166
3	132	148	159	156	184
4	123	132	154	160	169
5	118	126	128	143	163
6	128	106	135	134	153
7	92	143	113	144	143
8	105	111	139	118	154
9	94	126	113	171	141
10	111	100	125	119	170
11	92	99	86	135	119
12	97	104	107	82	118
Total	1,529	1,676	1,752	1,901	2,097

WORTHINGTON PUBLIC SCHOOLS FREE/REDUCED MEALS NET MIGRATION Fall to Fall				
Grade	2010 to 2011	2011 to 2012	2012 to 2013	2013 to 2014
K-5	20	-10	0	37
6-8	22	12	20	29
9-12	27	-5	44	5
Total	69	-3	64	71

WORTHINGTON PUBLIC SCHOOLS FREE/REDUCED MEALS NET MIGRATION BY GRADE Fall to Fall				
Grade	2010 to 2011	2011 to 2012	2012 to 2013	2013 to 2014
K to 1	-13	-8	-7	18
1 to 2	19	-1	4	-10
2 to 3	11	-3	13	13
3 to 4	0	6	1	13
4 to 5	3	-4	-11	3
5 to 6	-12	9	6	10
6 to 7	15	7	9	9
7 to 8	19	-4	5	10
8 to 9	21	2	32	23
9 to 10	6	-1	6	-1
10 to 11	-12	-14	10	0
11 to 12	12	8	-4	-17
Total	69	-3	64	71

WORTHINGTON PUBLIC SCHOOLS FREE/REDUCED MEALS SURVIVAL RATES Fall to Fall				
Grade	2010 to 2011	2011 to 2012	2012 to 2013	2013 to 2014
K to 1	0.917	0.954	0.962	1.094
1 to 2	1.133	0.993	1.024	0.943
2 to 3	1.080	0.981	1.091	1.076
3 to 4	1.000	1.041	1.006	1.083
4 to 5	1.024	0.970	0.929	1.019
5 to 6	0.898	1.071	1.047	1.070
6 to 7	1.117	1.066	1.067	1.067
7 to 8	1.207	0.972	1.044	1.069
8 to 9	1.200	1.018	1.230	1.195
9 to 10	1.064	0.992	1.053	0.994
10 to 11	0.892	0.860	1.080	1.000
11 to 12	1.130	1.081	0.953	0.874