



Ottawa Hills Local School District

Demographic Study Project Number 215005.00

2015

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Section 1

OVERVIEW

Fanning Howey was retained by the Ottawa Hills Local School District to prepare a demographic study and enrollment projection. Fanning Howey uses a modified cohort component (survival) method to develop a district-wide demographic projection.

The standard or unmodified cohort component (survival) method is commonly used to project changes in population and enrollment. It begins by typically using ten years of past enrollment data. Future kindergarten enrollment is projected using linear regression. The percentage of kindergarten students in on year who become first grade students the next year is calculated. That is done for each grade change; first graders moving to second grade, second graders moving to third etc. The annual percentage moving from grade to grade is averaged over the ten-year period. That is the grade to grade survival ratio. Those individual grade percentages are used to project the following year's enrollment.

In a district such as Ottawa Hills Local School District that has experienced changes in student enrollment during the past several years, the standard cohort component method limits accuracy. In addition, if kindergarten enrollment were projected using a linear regression only, total kindergarten enrollment would be projected to decline to only 19 students in ten years. That is not indicative of the factors that are driving overall enrollment

The projection in this report represents the modified cohort survival method used by Fanning Howey. This projection, rather than relying on linear regression to project kindergarten enrollment, uses the number of births occurring to women living in the district as compared to the actual kindergarten enrollment five (5) years later. Data from the Ohio Department of Health is provided on a county-wide basis. Therefore, the number of women of childbearing age living in the district was compared to the number in Lucas County as a whole.

The average birth to kindergarten ratio since 1995 is 91.0%. That percentage was applied to the number of births occurring in 2010, 2011, 2012 and 2013 to project the number of kindergarten students who will be enrolling.

Since the birth data from 2014 is not yet available and the births in 2015 through 2019 are in the future those births were projected based on the projected number of women who will be living in the district and are of childbearing age. Using those projected births and applying the 91% birth to kindergarten ratio the remaining kindergarten enrollment figures were derived.

The remainder of the projection for the other grades was developed using the grade-to-grade ratios as previously presented. When appropriate, slight modifications were made to the projection to reflect changes in the underlying factors that affect enrollment.

Section 2

METHODOLOGY

Fanning/Howey Associates Inc. uses a modified cohort component (survival) method to develop the district-wide demographic projections. The cohort component method is one of the most common and accepted methods of projecting changes in population and enrollment.

The district population was divided into distinct five-year [5] increment age groups (cohorts). Therefore, the population of the study area was divided into those persons age 0 to 4, 5 to 9, 10 to 14, etc. Due to the small size of the final cohort, persons age 85 and over were considered as one cohort.

Using a combination of the annual fertility and mortality rates for each cohort, the population is "aged" each year throughout the planning period. Typically, this is done for a ten-year period. Longer periods can be used with the understanding that reliability decreases as the length of the planning period is increased.

The fertility and mortality rates are taken from various sources including vital statistics from the State of Ohio and other established sources such as the insurance industry. Ohio provides information on births and deaths by county.

Population changes are also affected by migration into and out the area. Traditionally, this is the most difficult factor to assess. Fanning Howey considers the level of migration in several ways. First, local housing Multiple Listing Service (MLS) data is incorporated into the population projection model. In established areas there is often a demographic shift exhibited as older "empty nesters" relocate to alternative housing. They tend to sell larger homes where they raised their families. Families with young children, or "DINKS" (Dual Income No Kids) who are planning on starting a family, move in thus beginning a "recycling" of the housing stock.

Finally, a macro-level source of data is the Internal Revenue Service. The IRS codes the individual income tax returns by the social security number of the primary filer. The code establishes the

location of the home from which the return was filed. The following year the location code of the primary filer is compared to the previous year's location code. Tables of outflows and inflows by county for each state are developed. Again, this represents macro-level data that is useful for spotting general county-wide trends.

Whenever possible, as much of this information is used to augment the cohort component method. The result is the development of a ten-year demographic projection for the population residing in Ottawa Hills Local School District. This projection provides needed information, especially about births upon which future kindergarten enrollment relies.

Following completion of the district-wide population projection the next step is to develop a gradeto-grade enrollment projection. This is done by assessing the grade-to-grade survival ratio for the past several years. In a district such as Ottawa Hills Local School District that has experienced some changes in student enrollment both increases and decreased during the past ten years, grade-tograde survival ratios by themselves limit accuracy. Under that scenario, an adjustment is made to account for the students that are likely to enroll or leave the district as a result of changes to the in and out migration patterns or changes in the number of births. For this study some modest adjustments were made that are discussed more in the following section.

Section 3

ENROLLMENT PROJECTION

The process of generating enrollment projections has been detailed in the Methodology section of this report. As stated, the cohort-survival method was used. In order to improve the accuracy of the projections some adjustments were made. The following sub-section details what statistics were used to make those adjustments. That sub-section is followed by tables showing the actual and projected enrollment for the Ottawa Hills Local School District as a whole as well as for each individual school.

A. Statistics Used in Adjusting the Demographic Projection

Fertility and Mortality: In order to "age" the population cohorts in the Ottawa Hills Local School District, fertility and mortality rates had to be established. Using the published data on births and deaths the average crude birth rate of is 13.2 births per 1,000 persons. The corresponding mortality rate is 9.8 deaths per 1,000 persons.

It should be noted that the crude birth rate has decreased from 14.9 births per 1,000 persons in 1995 to the current rate of 13.2 births. In addition the number of women of childbearing age living in the District has decreased slightly since peaking in 1990. During the coming years the number is expected to increase slightly. The following table shows the number of women of childbearing age (defined by the U.S. Census Bureau as women between the ages of 15 and 49) by decade and the change in those numbers.

Women of Childbearing Age	Ottawa Hills LSD	Change
1980	911	
1990	1,032	121
2000	939	-93
2010	945	5
2020	959	14
2030	959	1
2040	960	1

As shown the greatest increase in the number of women of childbearing age residing in the district was between 1980 and 1990. That was followed by a significant decline between 1990 and 2000 and a very small increase during the next decade. The very slight increase in that number during the next twenty-five years coupled with the decline in the birth rate will have a dampening effect on the number of births and associated kindergarten enrollment five years later. However, without the stabilization of the number of women of childbearing age the decrease caused by the declining birth rate would be more pronounced.

The overall population in the district continues to grow younger. In 2000, the average age of the Ottawa Hills Local School District residents was 43.7.8. By 2010, that average had fallen to 40.5 years of age.

Consider the following chart. It illustrates the percent of the population in each age cohort in 2000 as compared to 2010. Note the significant increases in the percent of the population in the 20 to 34.



The net result of this shift is that long-term the enrollment will stabilize and then increase. During the next ten years, however, the experienced decline in the overall number of women of childbearing age and the declining birth rate will result in a modest decline in the number of births in the district and, five years later, a decline in the number of children enrolled in kindergarten. Populations, however, exhibit cyclical patterns. The fact that the district population as a whole is growing younger indicates that in the future, past the ten year planning period, there will be an increase in the number of school age children.

Migration: In an area such as the Ottawa Hills Local School District, with an established housing stock, it is not only new housing starts but sales of existing homes fueled by net in-migration that is the driving factor. Based on MLS data, as well as data from the Internal Revenue Service, there is a net out-migration from the district.

The following table shows the in, out and net migration in Lucas County. It should be noted that this information was obtained from the U.S. Internal Revenue Service. Each year the address of the primary tax return filer is analyzed and a table of changes is developed. The table shows how many people (noted as exemptions) were in each county the previous year and how many resided in each county the current year. In addition, the counties to which people migrated to or migrated from are also shown. This is done on a county-wide basis throughout the country.

IRS Migration	2005	2009	2011
Lucas Co.			
In	12,123	11,385	10,262
Out	15,746	15,746	13,526
Net	-3,623	-4,361	-3,264
Ottawa Hills Local School District			
In	126	119	107
Out	164	164	141
Net	-38	-45	-34

There has been a net out-migration from Lucas County for several years. By the time of the "bottoming out of the Great Recession" in 2009 Lucas County was experiencing a net out-migration of 4,361 persons. In 2011, which is the latest year for which this information is currently available, Lucas County had rebounded slightly but is still experiencing a net out-migration.

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Again, the data is on a county-wide basis. Since the Ottawa Hills Local School District contains approximately 1.04% of Lucas County's population it can be assumed that the migration patterns within the district are similar to those experienced by the county. Therefore, the net migration in the district is shown at the bottom of the preceding table. While more people are moving out of the district than into the district it is still lower than the rate prior to the Great Recession.

Economic Changes: In the tables on the following pages is information taken from the County Business Patterns provided by the U.S. Census Bureau. As with the migration data this information is only available on a county-wide basis. It does, however, provide significant insight into a driving factor behind migration. Please note that some information is not provided due to the small number of firms or employees. In other cases a range is provided. The following is a listing of the codes.

а	0-19 employees
b	20-99 employees
с	100-249 employees
е	250-499 employees
f	500-999 employees
g	1,000-2,499 employees
h	2,500-4,999 employees
i	5,000-9,999 employees
j	10,000-24,999 employees
k	25,000-49,999 employees
I	50,000-99,999 employees
m	100,000 or more employees
S	Withheld because estimate did not meet publication standards
	Withheld to avoid disclosing data for individual companies data are included in higher
d	level totals

COUNTY BUSINESS PATTERNS LUCAS									
2004 AND 2012		Da	ata		Change				
	20	04	20	12	20	04	2012		
Description	Companies	Employees	Companies	Employees	Companies	Companies	Companies	Employees	
Total for all sectors	10,898	212,853	9,667	193,955	(1,231)	(18,898)	-11.3%	-8.9%	
Agriculture, forestry, fishing and hunting	10	53	5	b	(5)		-50.0%	0.0%	
Mining, quarrying, and oil and gas extraction	6	В	6	78	0		0.0%		
Utilities	18	917	17	е	(1)		-5.6%	0.0%	
Construction	909	11,288	625	6,329	(284)	(4,959)	-31.2%	-43.9%	
Manufacturing	587	25,287	457	18,442	(130)	(6,845)	-22.1%	-27.1%	
Wholesale trade	634	8,266	534	7,307	(100)	(959)	-15.8%	-11.6%	
Retail trade	1,676	28,821	1,452	23,067	(224)	(5,754)	-13.4%	-20.0%	
Transportation and warehousing	297	7,650	239	5,611	(58)	(2,039)	-19.5%	-26.7%	
Information	167	3,655	132	2,791	(35)	(864)	-21.0%	-23.6%	
Finance and insurance	780	6,764	673	5,768	(107)	(996)	-13.7%	-14.7%	
Real estate and rental and leasing	430	2,774	401	2,575	(29)	(199)	-6.7%	-7.2%	
Professional, scientific, and technical services	1,007	9,516	866	9,179	(141)	(337)	-14.0%	-3.5%	
Management of companies and enterprises	90	6,667	97	6,899	7	232	7.8%	3.5%	
Administrative/waste management/remediation services	553	22,017	540	29,985	(13)	7,968	-2.4%	36.2%	
Educational services	122	3,926	143	5,581	21	1,655	17.2%	42.2%	
Health care and social assistance	1,234	40,720	1,280	38,363	46	(2,357)	3.7%	-5.8%	
Arts, entertainment, and recreation	161	3,552	138	4,249	(23)	697	-14.3%	19.6%	
Accommodation and food services	1,003	19,863	1,019	19,086	16	(777)	1.6%	-3.9%	
Other services (except public administration)	1,182	11,018	1,037	8,121	(145)	(2,897)	-12.3%	-26.3%	
Industries not classified	32	В	6	33	(26)		-81.3%		

During the period between 2004 and 2011, Lucas County lost 1,231 companies and 18,898 paid employment positions. The significant decline in the number of jobs created is mirrored by the significant increase in net out-migration. As the economy rebounds and stabilizes the loss of jobs should end and migration will return to a much lower level of out-migration.

Clearly, efforts are being made, not only in Lucas County but in all areas throughout the state of Ohio where companies and jobs have been lost to reverse that trend. The question is when that will occur.

B. Population Projections

On the following pages is a table showing the actual and projected district population. The actual data goes back to the 1980 Census. It has been projected forward over the next twenty-five years until 2040.

OTTAWA HILLS LOCAL SCHOOL DISTRICT										
Demographic Cohorts	1980	1990	2000	2010	2020	2030	2040			
Under 5 years	232	275	227	316	314	334	354			
5 to 9 years	324	370	436	384	440	464	489			
10 to 14 years	347	374	466	287	346	338	329			
15 to 19 years	369	335	342	381	368	372	377			
20 to 24 years	179	166	114	224	192	200	208			
25 to 34 years	325	364	232	393	347	354	361			
35 to 44 years	609	816	704	530	578	543	508			
45 to 54 years	610	686	900	648	793	826	859			
55 to 59 years	290	263	314	335	347	366	384			
60 to 64 years	290	263	199	400	355	381	408			
65 to 74 years	331	374	358	287	301	286	271			
75 to 84 years	327	255	354	196	210	180	151			
85 years and over	91	216	99	166	170	180	191			
Total	4,324	4,758	4,745	4547	4,758	4,823	4,889			

It is from this table that significant information was derived regarding the number of women of childbearing age. From that number estimates of future births were developed. Clearly, the district is projected to grow modestly over the next twenty-five years.

C. Enrollment Projections

On the following pages are tables showing the actual and projected enrollment over the next ten years. The first table is the actual enrollment for the district as a whole. Following the actual enrollment table is the projected enrollment. Those tables are followed by a graph showing the actual and projected enrollment.

This projection represents the modified cohort survival method used by Fanning Howey. For this the estimated number of births occurring to women living in the district was compared to the actual kindergarten enrollment five (5) years later. On the following page is a table detailing that analysis.

It should be noted that the Ohio Department of Health provides birth data on a county-wide basis. The number of births in the district was developed by taking the number of women living in the district as a percentage of the total number of women living in the two counties. Applying that percentage to the total number of births occurring each year provides the number of births within the district.

Therefore, in 1998 it was estimated that 62 of the total number of births occurring in Lucas County were to women living within the Ottawa Hills Local School District. Five years later in 2003, there were 55 students enrolled in kindergarten or 89.35%. A similar analysis was done each year until 2009. Children born that year would enroll this year in kindergarten.

The average birth to kindergarten ratio since 1998 is 96.26%. That percentage was applied to the number of births occurring in 2010, 2011, 2012 and 2013 to project the number of kindergarten students who will be enrolling.

Since the birth data from 2014 is not yet available and the births in 2015 through 2019 are in the future those births were projected based on the projected number of women who will be living in the district and are of childbearing age. Using those projected births and applying the 96.26% birth to kindergarten ratio the remaining kindergarten enrollment figures were derived.

Ottawa Hills LSD	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008
Births	62	61	62	61	58	61	61	59	61	61	59
K Enrollment (+5 yrs)											
Year	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013
Enrollment	55	72	65	72	54	55	58	53	54	56	43
Factor	108.38%	84.34%	104.29%	89.35%	117.45%	104.26%	117.67%	92.57%	90.35%	108.38%	84.34%

Ottawa Hills LSD	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019
Births	57	55	57	57	57	56	56	56	55	55	55
K Enrollment (+5 yrs)											
Year	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024
Enrollment	55	53	55	55	55	54	54	54	53	53	52
Factor	96.11%										
Average	96.26%										

Ottawa Hills Local School District

ACTUAL ENROLLMENT

	2000-01	2001-02	2002-03	2003-04	2004-05	2005-06	2006-07	2007-08
Kindergarten	70	51	65	55	72	65	72	54
1 st	60	83	78	71	63	75	63	71
2 nd	97	63	59	84	74	65	74	76
3 rd	87	95	86	65	80	81	80	66
4 th	83	95	66	82	64	78	64	81
5 th	77	86	103	65	87	68	87	79
6 th	76	79	99	100	63	85	63	70
7 th	84	74	94	96	100	63	100	89
8yh	84	85	77	92	99	103	99	64
9 th	79	79	73	65	73	92	73	88
10 th	70	79	71	75	70	70	70	95
11 th	77	70	77	69	83	70	83	74
12 th	56	77	78	78	65	76	65	68
DISTRICT	1,000	1,016	1,026	997	993	991	993	975
Change		16	10	-29	-4	-2	2	-18
% Change		1.6%	1.0%	-2.8%	-0.4%	-0.2%	0.2%	-1.8%

Ottawa Hills Local School District

ACTUAL ENROLLMENT

	2008-09	2009-10	2010-11	2011-12	2012-13	2013-14	2014-15
Kindergarten	55	58	53	54	56	43	55
1 st	69	65	73	62	62	66	44
2 nd	74	63	72	75	64	63	64
3 rd	81	77	69	77	80	67	66
4 th	68	88	78	72	83	86	69
5 th	79	77	98	80	71	81	82
6 th	84	86	80	102	80	68	78
7 th	71	85	86	83	99	84	67
8yh	90	76	86	90	82	93	79
9 th	64	81	74	78	82	69	88
10 th	86	66	81	74	80	82	74
11 th	96	88	67	79	68	80	79
12 th	78	92	86	64	82	67	80
DISTRICT	995	1,002	1,003	990	989	949	925
Change	20	7	1	-13	-1	-40	-24
% Change	2.1%	0.7%	0.1%	-1.3%	-0.1%	-4.0%	-2.5%

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<u>PROJECTED ENROLLMENT</u> (with actual 2014-15 shown for comparison)

	2014-15	2015-16	2016-17	2017-18	2018-19	2019-20	2020-21	2021-22	2022-23	2023-24	2024-25
Kindergarten	55	53	56	56	56	55	55	54	54	54	53
1 st	44	62	60	63	63	62	62	62	61	61	60
2 nd	64	45	64	62	65	65	64	64	64	63	63
3 rd	66	68	48	68	66	69	69	69	68	68	67
4 th	69	67	69	49	69	67	70	70	70	69	69
5 th	82	73	71	73	52	73	71	74	74	74	73
6 th	78	81	72	70	72	51	72	70	73	73	73
7 th	67	83	86	77	74	77	55	77	74	78	78
8yh	79	69	85	88	79	76	79	56	78	76	80
9 th	88	71	62	77	80	71	69	71	50	71	68
10 th	74	89	72	63	78	81	72	69	72	51	72
11 th	79	75	90	73	64	79	82	73	71	73	52
12 th	80	76	72	87	70	61	76	79	70	68	70
DISTRICT	925	913	908	905	886	887	894	887	880	878	878
Change	-24	-12	-5	-3	-19	1	7	-7	-8	-2	0
% Change	-2.5%	-1.3%	-0.5%	-0.3%	-2.1%	0.1%	0.8%	-0.8%	-0.9%	-0.2%	0.0%



Please note that for the projected enrollment "high/low" bars have been added. Those bars reflect a +/-4% range above and below the projected number of students. Demographers strive to have the projection be within that range. Demographic projections are, by their nature, not intended to be absolute numbers. The projections are affected by factors that cannot be predicted with certainty. Therefore, when the actual enrollment is within a 4% range of the projection it is deemed to be fairly accurate.

A single year with a student enrollment outside that range does not necessarily invalidate the projection. However, two consecutive years outside the range is cause for re-examining the projection. At that point a new projection may be warranted unless the deviation is readily apparent.

Section 4

SUMMARY

During the next ten years Ottawa Hills Local School District is projected to continue to experience a modest decrease in student enrollment. During the past thirteen years since the highest enrollment in the 2002-03 school years the district experienced an average loss of eight (8) students each year. Overall this represents a decrease of 101 or -10.1% in the total number of students.

The next ten (10) years will see an average of five (5) fewer students enrolled each year. Over the next ten years the Ottawa Hills Local School District will likely experience a decrease of -5.0% of its current student population.

It should be noted that beyond the ten year planning window the enrollment will likely begin a modest increase. Note that the last two years of the projected enrollment there is virtually no change in enrollment. That represents the "bottom" of the current enrollment cycle. Beyond that the rebound in the number of women of childbearing age will begin to take effect and kindergarten enrollment should stabilize and begin to increase slightly.

How reliable is this projection? As with any projection the reliability depends on the precision and accuracy of the underlying factors. The underlying economic factors can, and often do, shift with the passage of time.

Projected enrollment in the Ottawa Hills Local School District is being driven by the following factors and their impact on the number of students:

Number of women of childbearing age (currently)	•
Number of women of childbearing age (after 2020	1
Birth rate	$\mathbf{\Psi}$
Economic situation in Lucas County	¥
Migration into or out of the County/District	$\mathbf{\Psi}$

Clearly, most factors are resulting in a negative pressure on student enrollment. A significant change in any factor would affect the enrollment. The most likely factors to change are the economic situation and the associated migration trend. As previously stated efforts are on-going to stabilize and grow the regional economy.

When those efforts will result in a significant increase in job opportunities is difficult to predict. Without knowledge of an imminent change in the economy the projection needs to rely on past trends. Those trends need to hold for the enrollment projection to be accurate. If they do, Ottawa Hills Local School District should experience a modest decline over the next ten year period.