STATISTICAL FORECASTING LLC

Demographic Study

for the

Bernards Township School District

December 2017

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Executive Summary

Statistical Forecasting LLC ("Statistical Forecasting") completed a demographic study for the Bernards Township School District, projecting grade-by-grade enrollments from 2018-19 through 2022-23, a five-year period. In addition, the following tasks were completed:

- analyzed community population trends and age structure, birth and fertility rates, and new housing starts
- examined the district's historical enrollments trends, as well as for specified subpopulations (e.g., by race and economically disadvantaged)
- geocoded, or electronically "pin-mapped," student addresses from the 2012-13 and 2017-18 school years to show the relative concentrations of where students live
- projected enrollments based on student yields and housing turnover rates (resales) in a totally independent analysis

Community Overview

In the 2010 Census, Bernards Township ("Bernards") had 26,652 residents. Historically, the population nearly tripled from 1940-1970, with the greatest gain occurring in the 1940s (+65.9%). After a small decline in 1980, the population has been steadily increasing. Since 1980, the population has more than doubled. Forecasts prepared by the North Jersey Transportation Planning Authority project the population to be 27,368 in 2040, which would be a 2.7% increase from the 2010 population and a gain of more than 700 persons.

Regarding race, while Whites are the largest race in Bernards, their population has declined in the last decade. In 2010, Bernards was 81.8% White as compared to 89.2% in 2000, which is a loss of 7.4 percentage points. Asians were the second-largest race at 13.8% in 2010, which is a gain of 6.0 percentage points from the 2000 percentage (7.8%).

With respect to nativity, 18.6% of Bernards residents are foreign-born, which is slightly lower than that of New Jersey (21.7%). China and India are the largest sources, accounting for 28.0% and 10.7% respectively of the township's foreign-born population.

Historical Enrollment Trends

Historical enrollments were analyzed from 2008-09 through 2017-18, a 10-year period. After peaking at 5,751.5 students in 2013-14, enrollment (PK-12) has declined for four consecutive years. In 2017-18, enrollment is 5,407, which is a loss of 205.5 students (-3.7%) from the 2008-09 enrollment of 5,612.5.

Kindergarten replacements were analyzed to determine whether there was any relationship between overall enrollment change and kindergarten replacement, which is the numerical difference between the number of graduating 12th graders and the number of entering kindergarten students. The district has experienced negative kindergarten replacement in each of the last nine years. Negative kindergarten replacement occurs when the number of graduating 12th grade students is larger than the number of kindergarten students replacing them in the next

year. In 2017-18, there was a loss of 216.5 students due to kindergarten replacement, as 483.5 twelfth graders graduated in 2016-17 and were replaced by 267 kindergarten students in 2017-18. In the last four years, the district has lost an average of 168 students per year due to kindergarten replacement.

Enrollments by Subgroup

a) Race

Whites are the majority race in the district in 2017-18, consisting of 61.1% of the student population. Asians are the second-largest race (28.4%) and make up a larger share of the population as compared to five years prior. At the elementary level, Whites are the largest race in Cedar Hill, Liberty Corner, and Oak Street Elementary Schools while Asians are the largest race in Mount Prospect Elementary School. In the last five years, the Asian percentage has increased in all four elementary schools while the White percentage has declined in each school. In Annin Middle School and Ridge High School, Whites are the largest race at 61.5% and 65.0% respectively.

b) Economically Disadvantaged

At the district level, there has been little change in the last five years of the number of students that are economically disadvantaged (i.e., those that are receiving free or reduced lunch). In 2017-18, only 88 students were economically disadvantaged, which represents 1.6% of the student population. At the elementary level, the percentage of students who are economically disadvantaged is very low, ranging from 1-3% in each school. At Annin Middle School, the percentage of economically disadvantaged students ranged from 2.7% to 5.1% in the last five years. At Ridge High School, the percentage of economically disadvantaged students ranged from 6.2% to 10.9% in the last five years, which is the highest of any school in the district.

Birth Counts

The number of births in Bernards was used to project kindergarten enrollments. The number of births in Bernards has been generally declining. Births have declined from 367 in 2000 to 167 in 2015. As a result, kindergarten enrollment has declined from a high of 374 in 2009 to a low of 267 in 2017, which is not as large as the decline in the birth count. The inward migration of families with children under the age of five has reduced the potential impact of the declining birth count on the kindergarten enrollment.

In comparing births from both 2003 and 2015 at the elementary attendance area level, the greatest number of births in 2003 occurred in the Liberty Corner attendance area (103). However, in 2015, the number of births in the Cedar Hill, Liberty Corner, and Oak Street attendance areas were nearly identical (43-45 births) yet were substantially lower than 2003.

Regarding fertility rates, the fertility rate in Bernards is below that of both Somerset County and the State of New Jersey.

The 2000 and 2010 age-sex diagrams for Bernards were created to show the percentage of males and females in each age class. The largest number of individuals in 2000 was aged 40-44 for males and 35-39 for females. As these individuals advance in age, the largest cohort in 2010 was aged 45-49 for both genders. The greatest declines, both in number and percentage points, occurred in the 35-39 age group for both genders. There were also significant declines in the 25-29 and 30-34 age groups for females, which correspond to the ages when many females have their children. The combination of low fertility rates and the declining number of females in the 25-29, 30-34, and 35-39 age groups have likely led to the declining birth rate in Bernards.

Potential New Housing

Bernards municipal representatives provided information regarding current and future residential development in the community. There is the potential for 434 housing units in four separate developments. The largest projects would be the redevelopment of the former Dewy Meadow Shopping Center, which would consist of 198 rental units in a mix of apartments and townhouses, and the redevelopment of the Millington Quarry, which would contain 200 units in a mix of detached single-family homes, apartments, townhouses, and flats.

An estimate was made of the number of public school children that could potentially come from the proposed housing developments. A total of 246 public school children are projected to be generated from the new housing developments, with nearly all residing in the Cedar Hill attendance area. It should be noted that this estimate may be conservative, particularly if the townhouse/flat student yields are similar to that of Patriot Hill or Hamilton Ridge. If that is the case, and the student yield is 0.75 instead of the estimated 0.30, there would be an additional 71 public school children, raising the overall total to 317.

Due to the unavailability of the bedroom distributions for each development and the uncertainty of whether the proposed residential developments will get constructed, as well as the timeline of occupation, the baseline enrollment projections were not adjusted for the additional children anticipated from the new housing developments. It is recommended that the Board continue to monitor the status of all proposed developments to determine the future impact on the school district.

Home Sales

Home sales in Bernards were analyzed from 1976-2016. From 1976-1983, the number of home sales ranged from 9-27 per year, which is a reflection of the smaller housing stock in Bernards at the time. After 1987, the number of sales sharply increased, peaking at 911 in 2000. Due to the housing market crash and banking crisis, the number of sales declined to 375 in 2008. Since then, home sales have rebounded and have slowly increased. However, the number of sales in 2016 (511) is still far below the peak total that occurred in 2000.

Enrollment Projections

Enrollment projections were calculated at the school level and were computed for each grade from the 2018-19 school year through the 2022-23 school year. Total enrollment (PK-12) is projected to decline throughout the projection period. In 2022-23, enrollment is projected to be 4,698, which would be a loss of 709 students from the 2017-18 enrollment of 5,407. Negative kindergarten replacement is expected to continue to occur in the future and range from 199-242 students per year, which is similar to the negative kindergarten replacement that occurred in 2017-18 (-216.5).

At the elementary level containing grades PK-5, enrollment is projected to steadily decline throughout the projection period. In 2022-23, enrollment is projected to be 1,815, which would represent a loss of 399 students from the 2017-18 enrollment of 2,214. Declines are projected in each of the four elementary schools.

For grades 6-8 at Annin Middle School, enrollments are projected to decline throughout the projection period and be 1,136 in 2022-23, which would be a loss of 203 students from the 2017-18 enrollment.

For grades 9-12 at Ridge High School, enrollments are projected to decline throughout the projection period and be 1,747 in 2022-23, which would be a loss of 107 students from the 2017-18 enrollment.

Building Capacities

The capacities of the school buildings in the district were compared to the current enrollments in 2017-18 and the projected enrollments in the 2022-23 school year. All of the schools in the district currently have a surplus of seating, with the largest occurring at Mount Prospect Elementary School (+243) and Oak Street Elementary School (+177). In 2022-23, all of the schools are projected to have an increase in surplus seating due to declining enrollment, with the largest surplus occurring at Mount Prospect Elementary School (+365) and Ridge High School (+335).

Mapping

Student addresses from the school district were geocoded or "pin-mapped" for 2012-13 and 2017-18 using mapping software. The greatest number of children per census block in 2017-18 was located in the southwest section of the township in the Mount Prospect attendance area, corresponding to where The Hills is located, as well as sections within the Cedar Hill and Liberty Corner attendance areas. The number of students per census block has not changed appreciably in the last five years. Since all census blocks are not the same size, the greatest number of students are typically located in the largest census blocks. In an effort to control for the different census block sizes, the number of students in each census block was divided by the block's geographical area to determine the density of students (students per square mile). The greatest student densities were in the southwest section of the township in the Mount Prospect attendance area, corresponding to where The Hills is located.

Housing Turnover

Using historical housing turnover rates by length of ownership in Bernards along with current student yields by length of ownership, the number of PK-12 students was projected from 2017-2021 in a completely independent analysis. To accomplish this task, 9,544 Bernards housing units designated as Class 2 properties (1- to 4-family homes) were analyzed. To complete this analysis, three inputs were needed:

1. housing turnover rates by length of ownership
2. current distribution of homes by length of ownership
3. student yields by length of ownership

To compute turnover rates, home sales were obtained from 1969-2016, a period of 47 years. Turnover rates in Bernards were greatest at three years of ownership (6.2%) before declining, as turnover rates are lowest for longer lengths of ownership. For homes with 21 or more years of ownership, turnover rates were typically less than 1.0%.

In the first seven years of ownership, student yields in Bernards are fairly stable, ranging from 0.75-0.87 public school children per home. After 20 years of ownership, student yields are typically below 0.20 public school children per home.

A scenario based on historical and hypothetical turnover rates was created to demonstrate the potential impact on enrollment in the district. In this scenario, a small decline in enrollment is projected. In summary, enrollment is not likely to grow significantly due to housing turnover; other factors, such as higher fertility rates or new residential construction, would lead to enrollment growth.

Final Thoughts

In the next five years, enrollment (PK-12) is projected to decline in the Bernards Township School District. The declining birth rate in the township has resulted in smaller kindergarten cohorts entering the school district. In the short term, the elementary cohorts will decline as the smaller kindergarten grades enter the school district. Eventually, as the elementary cohorts advance into the middle and high schools, enrollments will decrease in those configurations as well.

The increase in the number of home sales in the last four years has led to an increase in the number of families with children, either under the age of 5 or in the lower elementary grades, moving into the community, as parents desire to have their children educated in a highly-rated and excellent school district. The inward migration is evident in the cohort survival ratios, particularly in the birth-to-kindergarten ratios. However, the district is projected to continue having negative kindergarten replacement, where the inward migration of students is not enough to overcome the loss of students due to this phenomenon. Regarding the potential new housing in Bernards, the school district should continue to monitor the status of the proposed developments as the projected decline in enrollment would be less if these developments are constructed.

Introduction

Statistical Forecasting LLC ("Statistical Forecasting") completed a demographic study for the Bernards Township School District, projecting grade-by-grade enrollments from 2018-19 through 2022-23, a five-year period. In addition, the following tasks were completed:

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Population Trends in Bernards Township

Located in Somerset County, Bernards Township ("Bernards") contains a land area of approximately 23.93 square miles, with an additional 0.13 square miles of water area. In the 2010 Census, Bernards had 26,652 residents, which is 1,113.7 persons per square mile. Historical and projected populations for Bernards from 1940-2040 are shown in Table 1 and Figure 1. From 1940-1970, the population nearly tripled, with its greatest gain occurring in the 1940s (+65.9%). After a small decline in 1980, the population has been steadily increasing, as the population has more than doubled since 1980.

Table 1
Historical and Projected Populations for Bernards Township
1940-2040

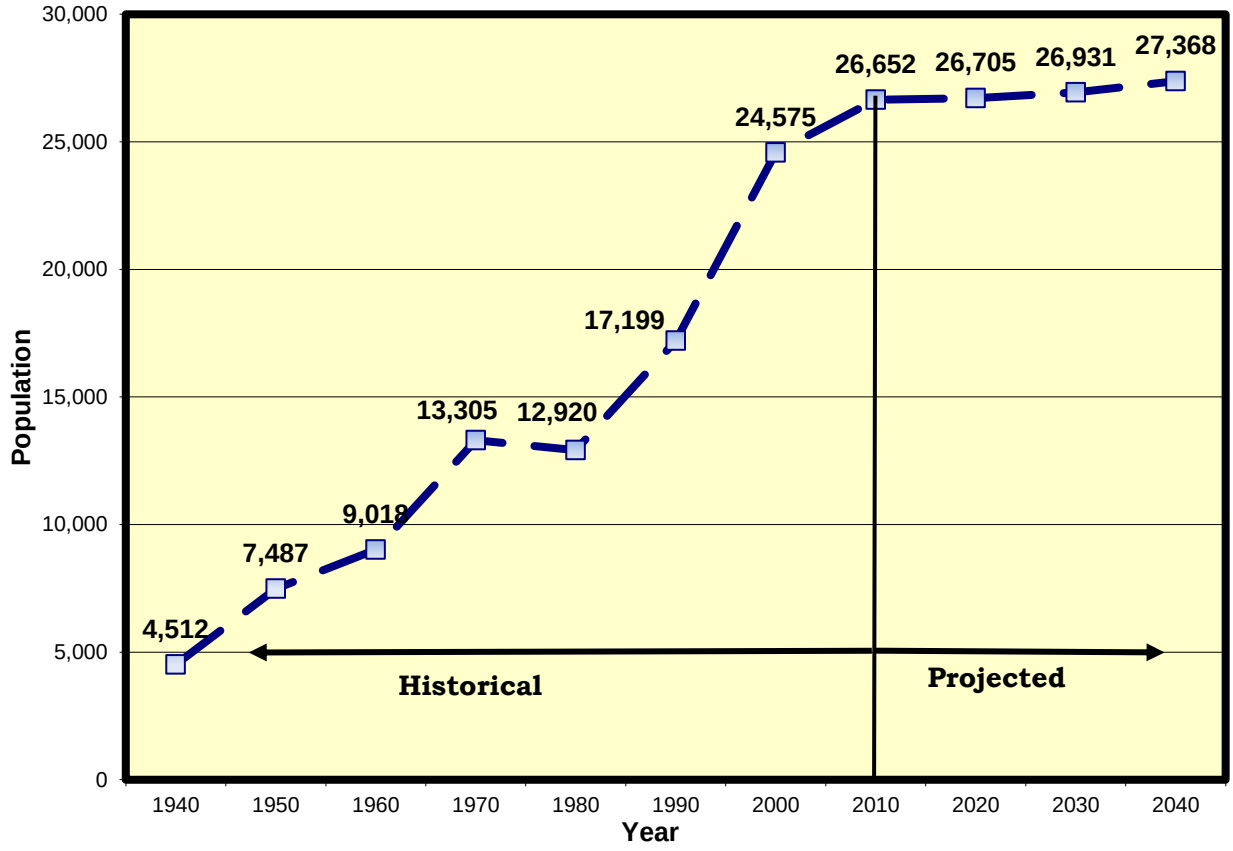
Year	Population	Percent Change
Historical[1]		
1940	4,512	N/A
1950	7,487	+65.9%
1960	9,018	+20.4%
1970	13,305	+47.5%
1980	12,920	-2.9%
1990	17,199	+33.1%
2000	24,575	+42.9%
2010	26,652	+8.5%
2015 (est.)	27,010	+1.3%
Projected[2]		
2020	26,705	-1.1%
2030	26,931	+0.8%
2040	27,368	+1.6%

Notes: [1]Source: United States Census Bureau
[2]Source: North Jersey Transportation Planning Authority, Inc. (2013)

In addition, a population estimate for 2015 is provided in Table 1. The estimated population in 2015 is 27,010 persons, which would be a gain of 358 persons from 2010. The Census Bureau publishes estimates every July 1st following the last decennial census and are computed using the decennial census base counts, number of births and deaths in a community, and migration data (both domestic and international).

Population projections from 2020-2040, which were prepared by the North Jersey Transportation Planning Authority ("NJTPA"), indicate that the population will slowly increase. In 2040, the population in Bernards is projected to be 27,368, which would be a 2.7% increase from the 2010 population and a gain of more than 700 persons. However, since the 2015 Census estimate has already exceeded the projected population in 2020 and 2030, the NJTPA projections likely need to be revised and increased to reflect the current trend.

Figure 1
Historical and Projected Populations for Bernards Township
1940-2040



Bernards Township Demographic Profile

In Table 2 following, selected demographic characteristics of Bernards are compared from the 2000 and 2010 Censuses and the 2011-2015 American Community Survey ("ACS"). While some Census variables account for everyone in the population (e.g., age and race), other variables are collected from a sample (e.g., median family income, educational attainment, poverty status, etc.). The ACS replaced the long form of the Census, last administered in 2000 to approximately 16% of the population in the United States. For small municipalities such as Bernards, ACS data represent a sample collected over a five-year time period, where the estimates represent the average characteristics between January 2011 and December 2015. This information does not represent a single point in time like the long form of earlier Censuses. The five-year ACS contains 1% annual samples from all households and persons from 2011 to 2015, resulting in a 5% sample of the population. Due to the small sample size, the sampling error is quite large, which increases the degree of uncertainty of the estimated values. Therefore, the forthcoming ACS data should be interpreted with caution.

While Whites are the largest race in Bernards, their population has declined in the last decade. In 2010, Bernards was 81.8% White as compared to 89.2% in 2000, which is a loss of 7.4 percentage points. Asians were the second-largest race at 13.8% in 2010, which is a gain of 6.0 percentage points from the 2000 percentage (7.8%). The Census Bureau does not consider Hispanic as a separate race; rather it identifies the percent of people having Hispanic origin. Hispanics in the Census population can be part of the White, Black, Asian, or any of the other race categories. It is not a mutually exclusive race category. The concentration of persons having Hispanic origin increased from 2.6% in 2000 to 4.0% in 2010.

Regarding nativity, 18.6% of the township's residents were foreign-born in the 2011-2015 ACS as compared to 12.5% in 2000, a gain of 6.1 percentage points. As a point of comparison, New Jersey's foreign-born resident percentage was 21.7% in the 2011-2015 ACS, which is slightly higher than Bernards. While not shown in the table, place of birth, which serves as a proxy for country of origin, indicates that China and India were the largest sources of immigrants in 2000, accounting for 18.3% and 11.4% respectively of the foreign-born population. In the 2011-2015 ACS, China continues to be the largest source, but accounts for a much larger share (28.0%) of the foreign-born population. India remains the second-largest source at 10.7%, which is slightly lower than the 2000 percentage.

The median age in Bernards has increased from 39.2 years in 2000 to 43.1 years in 2010, which is higher than the median age in New Jersey (39.4 years). During the same time period, the percentage of people under the age of 18 years increased slightly from 27.7% to 28.8%.

Regarding educational attainment for adults aged 25 and over, 73.0% of the population had a bachelor's degree or higher in the 2011-2015 ACS as compared to 67.4% in 2000, which is a gain of 5.6 percentage points. Bernards is a highly-educated population, as its percentage of persons having a bachelor's degree or higher is much greater than the state of New Jersey (36.8%). Persons with graduate or professional degrees increased from 30.6% to 35.9% during this time period.

Table 2
Selected Demographic Characteristics of Bernards Township

Race Origin	2000 Census	2010 Census 2011-2015 ACS
White	89.2%	81.8%
Black or African American	1.4%	1.9%
American Indian and Alaska Native	0.1%	0.1%
Asian	7.8%	13.8%
Native Hawaiian and Other Pacific Islander	0.0%	0.0%
Other Race	0.4%	0.6%
Two or more Races	1.0%	1.8%
Total	**100.0%**[1]	**100.0%**[1]
Hispanic Origin	2.6%	4.0%
Place of Birth		
Foreign-Born	12.5%	18.6%
Age		
Under 18	27.7%	28.8%
18-64	59.8%	57.7%
65 and over	12.5%	13.5%
Median age	39.2 years	43.1 years
Educational Attainment		
Bachelor's degree or higher	67.4%	73.0%
Graduate or professional degree	30.6%	35.9%
Income		
Median family income	$135,806	$169,013
Percentage of Persons in Poverty aged 5-17	0.8%	2.6%
Housing Units		
Total number	9,485	10,103[2]
Occupied units	9,242 (97.4%)	9,783 (96.8%)
Owner-occupied units	8,000 (86.6%)	8,499 (86.9%)
Renter-occupied units	1,242 (13.4%)	1,284 (13.1%)
Median value of an owner-occupied unit	$380,500	$649,200
Average household size	2.58	2.65
Housing Type		
Total number	9,485	9,929[2]
1-unit, attached or detached	7,330 (77.3%)	7,511 (75.6%)
Two units	84 (0.9%)	37 (0.4%)
Three or four units	526 (5.5%)	656 (6.6%)
Five to nine units	713 (7.5%)	663 (6.7%)
10 to 19 units	535 (5.6%)	749 (7.5%)
20 or more units	297 (3.1%)	296 (3.0%)
Mobile home	0 (0.0%)	17 (0.2%)

Sources: American Community Survey (2011-2015), United States Census (2000 and 2010)

Notes: [1]Data may not sum to 100.0% due to rounding.

[2]Total number differs as Housing Units are from the 2010 Census while Housing Type data are from the 2011-15 ACS.

Median family income increased from $135,806 in 2000 to $169,013 in the 2011-2015 ACS, a gain of 24.5%. By comparison, median family income in New Jersey is $88,335, which is approximately half that of Bernards. During this time period, the percentage of school-age children (5-17) that are in poverty increased from 0.8% to 2.6%.

Regarding housing, there were 10,103 housing units in Bernards in 2010, which is a gain of 618 housing units (+6.5%) from 2000. From 2000 to 2010, the overall occupancy rate decreased from 97.4% to 96.8%. Renter-occupied units accounted for 13.1% of the occupied units in 2010, which is similar to the 2000 percentage (13.4%). In the last decade, the average household size increased from 2.58 to 2.65 persons. Finally, the median home price of an owner-occupied unit in the 2011-2015 ACS was $649,200, which is a gain of 70.6% from the value reported in 2000 ($380,500).

With respect to housing type, 75.6% of Bernards homes are one-unit, either attached or detached, which is a 1.7 percentage point decline from 2000. Homes with 10-19 units were the second-largest type of housing in the 2011-2015 ACS and consisted of 7.5% of the housing stock, a 1.9 percentage point gain from 2000. Homes with 5-9 units had been the second-largest home type (7.5%) in 2000.

District Overview

The Bernards Township School District has six (6) schools that serve grades pre-kindergarten through twelfth. Children attend one of four (4) elementary schools for grades PK-5: Cedar Hill Elementary School ("Cedar Hill"), Liberty Corner Elementary School ("Liberty Corner"), Mount Prospect Elementary School ("Mount Prospect"), or Oak Street Elementary School ("Oak Street"). William Annin Middle School ("Annin") educates children in grades 6-8 while Ridge High School ("Ridge") educates children in grades 9-12. In Figure 2, the location of each of the district's schools is shown with respect to the municipal boundaries. Figure 3 shows only the elementary schools and their respective attendance areas. According to the district's Long Range Facility Plan ("LRFP"), total educational capacity in the district is 6,270 using District Practices methodology and 4,365 using Facilities Efficiency Standards ("FES") methodology. The District Practices methodology considers how the building is utilized by the school district and its targeted student-teacher ratios. This method does not take into account square footage allowances per student, which is the FES methodology. Capacity using FES methodology is often lower than when using District Practices methodology, but is used by the State for funding purposes. A comparison of each school's capacity to current enrollment is provided later in the report.

In this study, historical enrollments from the October 15th Fall Reports and the NJ SMART database were used to project enrollments for five years into the future. With the advent of NJ SMART, the Fall Report was eliminated by the New Jersey Department of Education ("NJDOE") in the 2010-11 school year. In the past, the Fall Report was used by the NJDOE as a tool to uniformly compare school district enrollment data across the state. Unfortunately, the method of reporting special education students for NJ SMART is different, as these students are now referred to as "ungraded." To maintain a level of consistency, "ungraded" student counts in the forthcoming tables were listed under the self-contained special education heading. Future enrollments were then projected using the Cohort-Survival Ratio method.

Figure 2
School Locations – Bernards Township School District

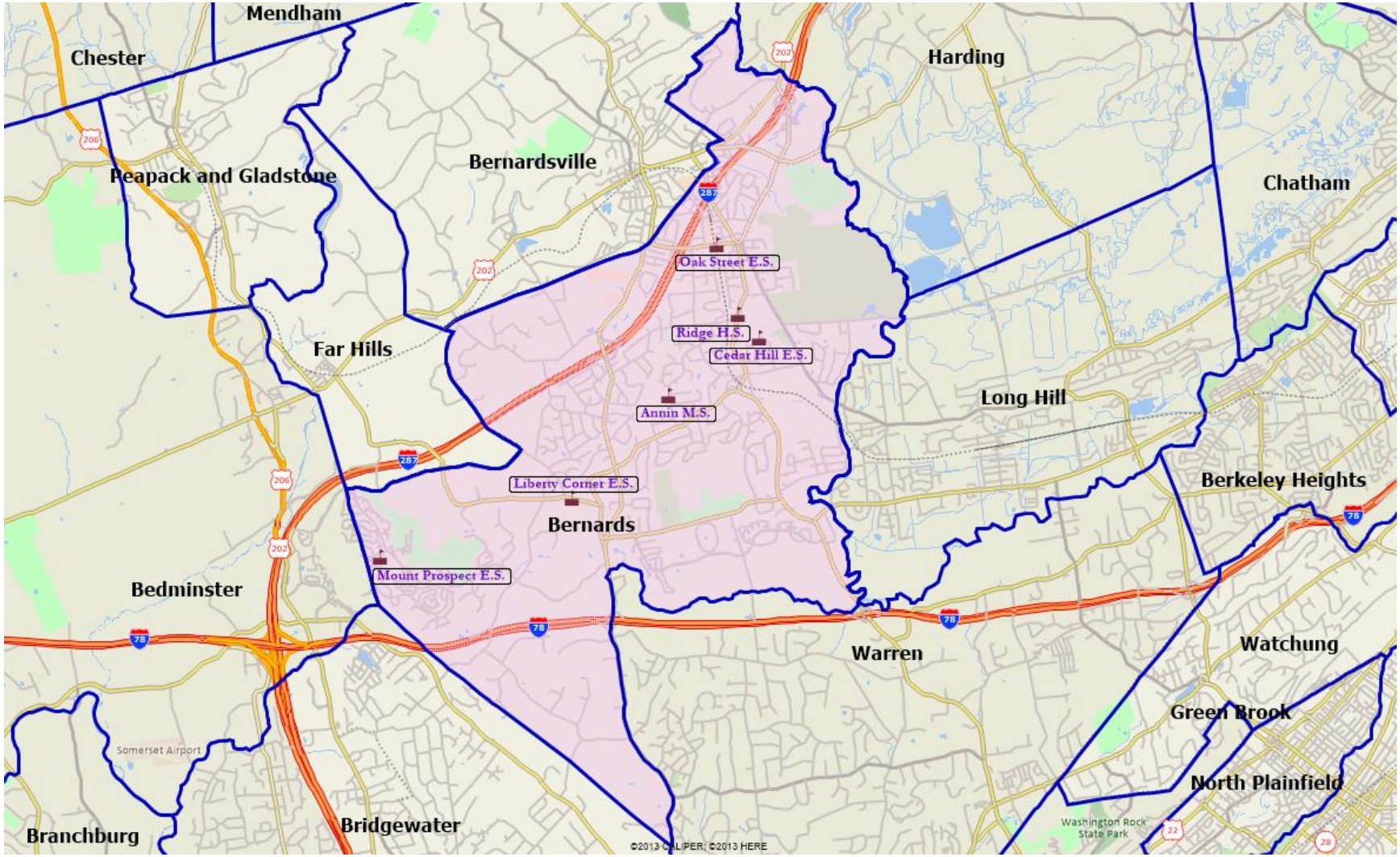
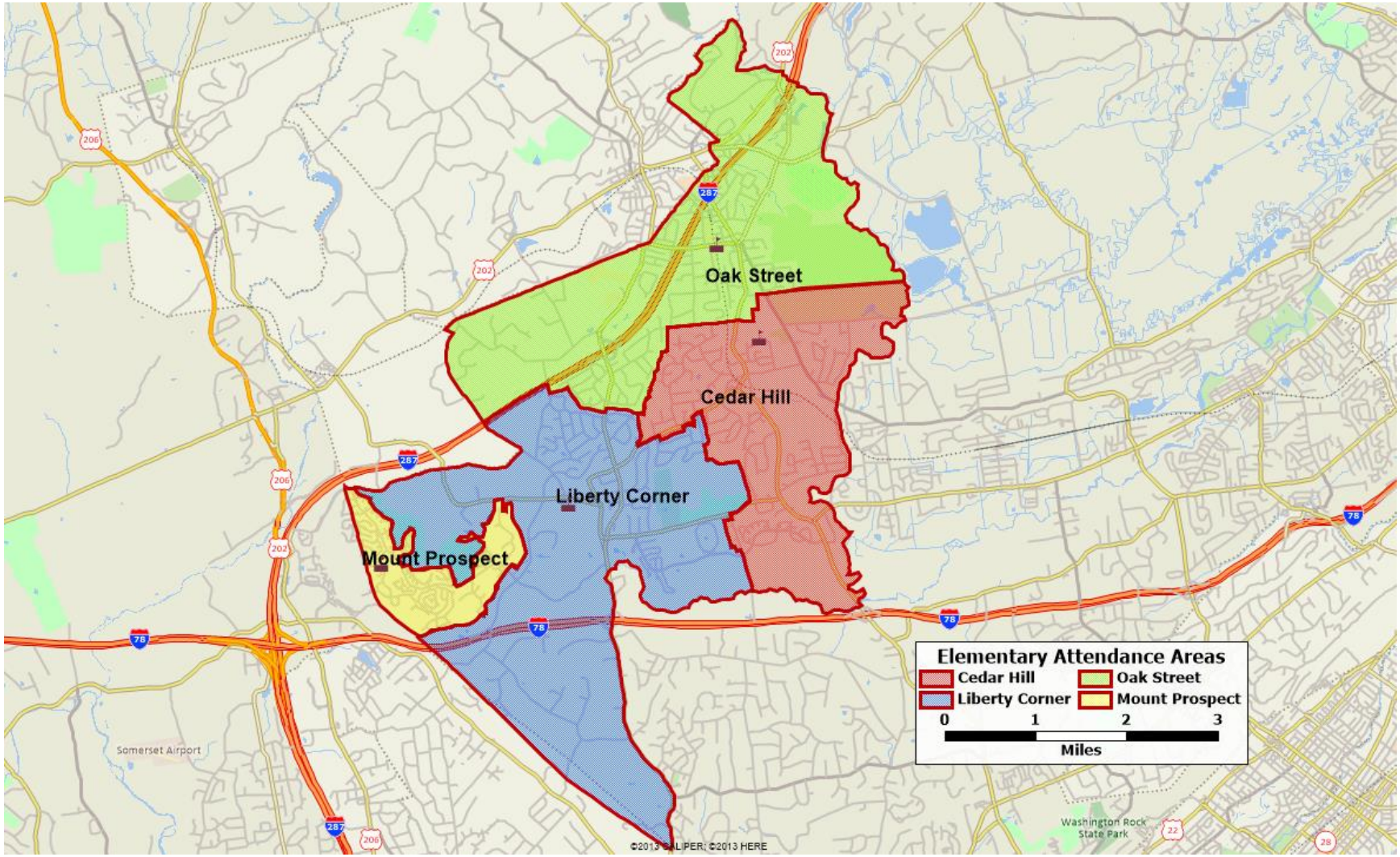


Figure 3
Elementary School Locations and Attendance Areas



Explanation of the Cohort-Survival Ratio Method

In 1930, Dublin and Lodka provided an explicit age breakdown, which enabled analysts to follow each cohort through its life stages and apply appropriate birth and death rates for each generation. A descendant of this process is the Cohort-Survival Ratio ("CSR") method, which is the NJDOE-approved methodology to project public school enrollments. In this method, a survival ratio is computed for each grade progression, which essentially compares the number of students in a particular grade to the number of students in the previous grade during the previous year. The survival ratio indicates whether the enrollment is stable, increasing, or decreasing. A survival ratio of one indicates stable enrollment, less than one indicates declining enrollment, while greater than one indicates increasing enrollment. If, for example, a school district had 100 fourth graders and the next year only had 95 fifth graders, the survival ratio would be 0.95.

The CSR method assumes that what happened in the past will also happen in the future. In essence, this method provides a linear projection of the population. The CSR method is most applicable for districts that have relatively stable increasing or decreasing trends without any major unpredictable fluctuations from year to year. In school districts encountering rapid growth not experienced historically (a change in the historical trend), the CSR method must be modified and supplemented with additional information. In this study, survival ratios were calculated using historical data for birth to kindergarten, kindergarten to first grade, first grade to second grade, etc. Due to the fluctuation in survival ratios from year to year, it is appropriate to calculate an average survival ratio, which is then used to calculate grade enrollments five years into the future.

Historical Enrollment Trends

Historical enrollments for the Bernards Township School District from 2008-09 through 2017-18, a ten-year period, are shown in Figure 4 and Table 3. After peaking at 5,751.5 students in 2013-14, enrollment (PK-12) has declined for four consecutive years. In 2017-18, enrollment is 5,407, which is a loss of 205.5 students (-3.7%) from the 2008-09 enrollment of 5,612.5.

Table 4 following shows computed grade-by-grade survival ratios from 2008-09 to 2017-18. In addition, the average, minimum, and maximum survival ratios are shown for the past ten years along with the five-year averages, which were used to project enrollments. The average survival ratios also indicate the net migration by grade, where values over 1.000 reflect net inward migration and values below 1.000 reflect net outward migration. Ten of the thirteen average survival ratios (five-year average) were above 1.000, indicating a general inward migration of students, particularly in the elementary and middle school grades. The three ratios that were below 1.000 were in the high school grades. Factors related to inward migration include families with school-age children purchasing an existing home or new housing unit. The reasons for families moving into a community vary. For instance, a family could move into Bernards for economic reasons and proximity to employment. Another plausible reason for inward migration is the reputation of the school district, as the appeal of a school district draws families into a community, resulting in the transfer of students into the district. On the flip side, outward migration is caused by families with children moving out of the community, perhaps due to difficulty in finding employment or affordable housing. Outward migration in the school district can also be caused by parents choosing to withdraw their children from public school to attend private or parochial schools. In the case of the Bernards Township School District, the reasons for migration are not explicitly known (such as for economic reasons or the appeal of the school district), as exit and entrance interviews would need to be conducted for all children leaving or entering the district.

Figure 4
Bernards Township School District Historical Enrollments
2008-09 to 2017-18

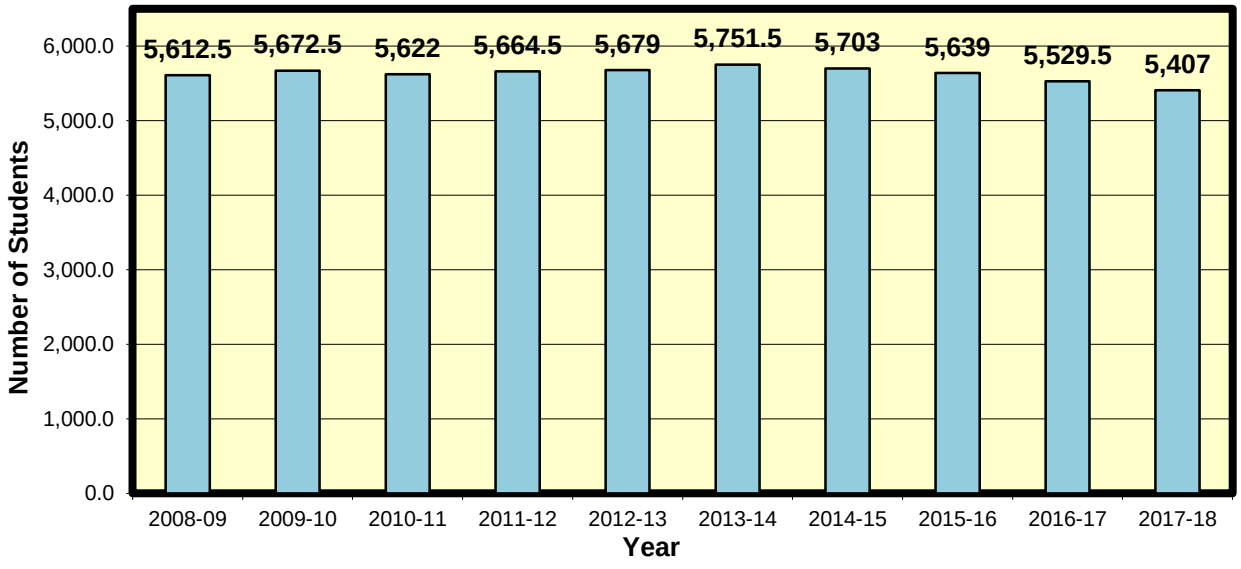


Table 3
Bernards Township School District Historical Enrollments
2008-09 to 2017-18

Year[1]	PK RE[2]	K	1	2	3	4	5	6	7	8	9	10	11	12	SE[3]	PK-5 Total	6-8 Total	9-12 Total	PK-12 Total
2008-09	14	354	377	404	398	469	459	445	448	421	440	403	427.5	397	156	**2,573**	**1,347**	**1,692.5**	**5,612.5**
2009-10	10	374	380	377	423	409	477	478	455	449	427	443	402	424.5	144	**2,559**	**1,398**	**1,715.5**	**5,672.5**
2010-11	0	334	395	398	385	431	420	479	476	458	440	425.5	437	396.5	147	**2,471**	**1,428**	**1,723**	**5,622**
2011-12	32	342	347	408	417	398	436	433	484	476	452.5	442.5	421	435.5	140	**2,479**	**1,408**	**1,777.5**	**5,664.5**
2012-13	39	322	376	361	438	412	406	456	447	488	458.5	455.5	438	422	160	**2,469**	**1,409**	**1,801**	**5,679**
2013-14	36	314	364	396	392	460	424	433	462	453	489.5	457	457.5	440.5	173	**2,513**	**1,364**	**1,874.5**	**5,751.5**
2014-15	31	308	338	385	396	410	449	453	443	466	451.5	490	462.5	450	170	**2,432**	**1,382**	**1,889**	**5,703**
2015-16	38	311	322	348	401	407	413	454	463	454	469.5	443.5	484.5	458.5	172	**2,355**	**1,396**	**1,888**	**5,639**
2016-17	32	273	323	330	358	417	422	421	452	456	456.5	467.5	445	483.5	193	**2,281**	**1,359**	**1,889.5**	**5,529.5**
2017-18	26	267	307	337	339	375	426	426	434	453	466	449	465	449	188	**2,214**	**1,339**	**1,854**	**5,407**

Notes: [1]Data were provided by the New Jersey Department of Education (http://www.nj.gov/education/data/enr/) and the Bernards Township School District.
[2]Pre-kindergarten regular education enrollment
[3]Self-contained special education enrollment/Ungraded Students

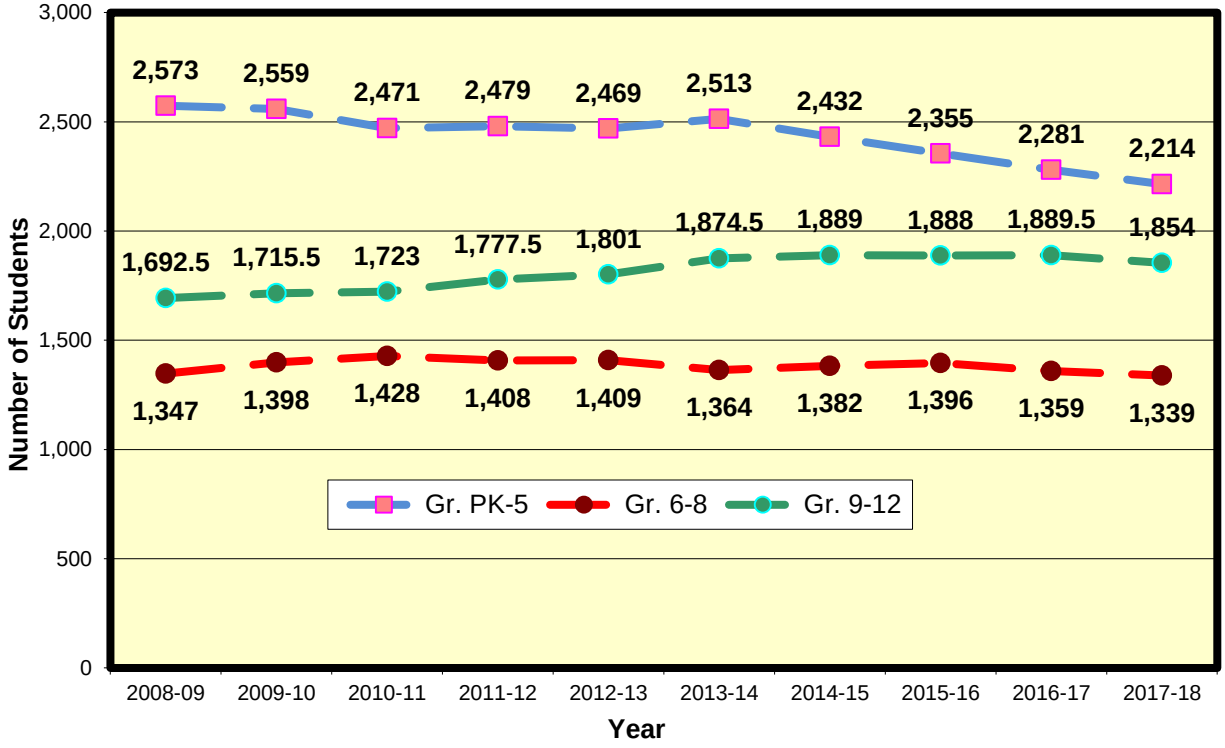
Table 4
Bernards Township School District Historical Survival Ratios
2008-09 to 2017-18

Progression Years	B-K	K-1	1-2	2-3	3-4	4-5	5-6	6-7	7-8	8-9	9-10	10-11	11-12
2008-09 to 2009-10	1.2593	1.0734	1.0000	1.0470	1.0276	1.0171	1.0414	1.0225	1.0022	1.0143	1.0068	0.9975	0.9930
2009-10 to 2010-11	1.1844	1.0561	1.0474	1.0212	1.0189	1.0269	1.0042	0.9958	1.0066	0.9800	0.9965	0.9865	0.9863
2010-11 to 2011-12	1.2258	1.0389	1.0329	1.0477	1.0338	1.0116	1.0310	1.0104	1.0000	0.9880	1.0057	0.9894	0.9966
2011-12 to 2012-13	1.3036	1.0994	1.0403	1.0735	0.9880	1.0201	1.0459	1.0323	1.0083	0.9632	1.0066	0.9898	1.0024
2012-13 to 2013-14	1.3362	1.1304	1.0532	1.0859	1.0502	1.0291	1.0665	1.0132	1.0134	1.0031	0.9967	1.0044	1.0057
2013-14 to 2014-15	1.4667	1.0764	1.0577	1.0000	1.0459	0.9761	1.0684	1.0231	1.0087	0.9967	1.0010	1.0120	0.9836
2014-15 to 2015-16	1.3946	1.0455	1.0296	1.0416	1.0278	1.0073	1.0111	1.0221	1.0248	1.0075	0.9823	0.9888	0.9914
2015-16 to 2016-17	1.4368	1.0386	1.0248	1.0287	1.0399	1.0369	1.0194	0.9956	0.9849	1.0055	0.9957	1.0034	0.9979
2016-17 to 2017-18	1.3906	1.1245	1.0433	1.0273	1.0475	1.0216	1.0095	1.0309	1.0022	1.0219	0.9836	0.9947	1.0090
Maximum Ratio	1.4667	1.1304	1.0577	1.0859	1.0502	1.0369	1.0684	1.0323	1.0248	1.0219	1.0068	1.0120	1.0090
Minimum Ratio	1.1844	1.0386	1.0000	1.0000	0.9880	0.9761	1.0042	0.9956	0.9849	0.9632	0.9823	0.9865	0.9836
Avg. 5-Year Ratios	1.4050	1.0713	1.0389	1.0244	1.0403	1.0105	1.0271	1.0179	1.0051	1.0079	0.9907	0.9997	0.9955
Avg. 10-Year Ratios	1.3331	1.0759	1.0366	1.0414	1.0311	1.0163	1.0330	1.0162	1.0057	0.9978	0.9972	0.9963	0.9962

Historical enrollments are also shown in Table 3 and Figure 5 by grade configuration (PK-5, 6-8, and 9-12). Self-contained special education/ungraded students were incorporated into the totals by grade configuration level.

For grades PK-5, enrollments were fairly stable from 2008-09 through 2013-14, ranging from 2,471-2,573. However, enrollments have declined in each of the last four years, losing 300 students over this time period. In 2017-18, enrollment is 2,214, which is a loss of 359 students from the 2008-09 enrollment of 2,573.

Figure 5
Bernards Township School District
Historical Enrollments by Level
2008-09 to 2017-18



For grades 6-8 at Annin, enrollments have been fairly stable in the last ten years, varying from 1,339-1,428, a range of 89 students. In 2017-18, enrollment is 1,339, which is nearly identical to the 2008-09 enrollment of 1,347.

At Ridge, which contains grades 9-12, enrollment increased through 2014-15 before stabilizing. In 2017-18, enrollment is 1,854, which is a gain of 161.5 students from the 2008-09 enrollment of 1,692.5.

Kindergarten Replacement

Kindergarten replacements were analyzed to determine whether there was any relationship between overall enrollment change and kindergarten replacement, which is the numerical difference between the number of graduating 12th graders and the number of entering kindergarten students. The district has experienced negative kindergarten replacement in each of the last nine years. Negative kindergarten replacement occurs when the number of graduating 12th grade students is larger than the number of kindergarten students replacing them in the next year. Positive kindergarten replacement occurs when the number of graduating 12th grade students is less than the number of kindergarten students entering the district in the next year. As shown in Figure 6, negative kindergarten replacement has ranged from 23-216.5 students per year. In 2017-18, there was a loss of 216.5 students due to kindergarten replacement, as 483.5 twelfth graders graduated in 2016-17 and were replaced by 267 kindergarten students in 2017-18. In the last four years, the district has lost an average of 168 students per year due to kindergarten replacement. As the figure shows, the magnitude of the negative kindergarten replacement has been increasing over time.

Figure 6
Bernards Township School District
Historical Kindergarten Replacement

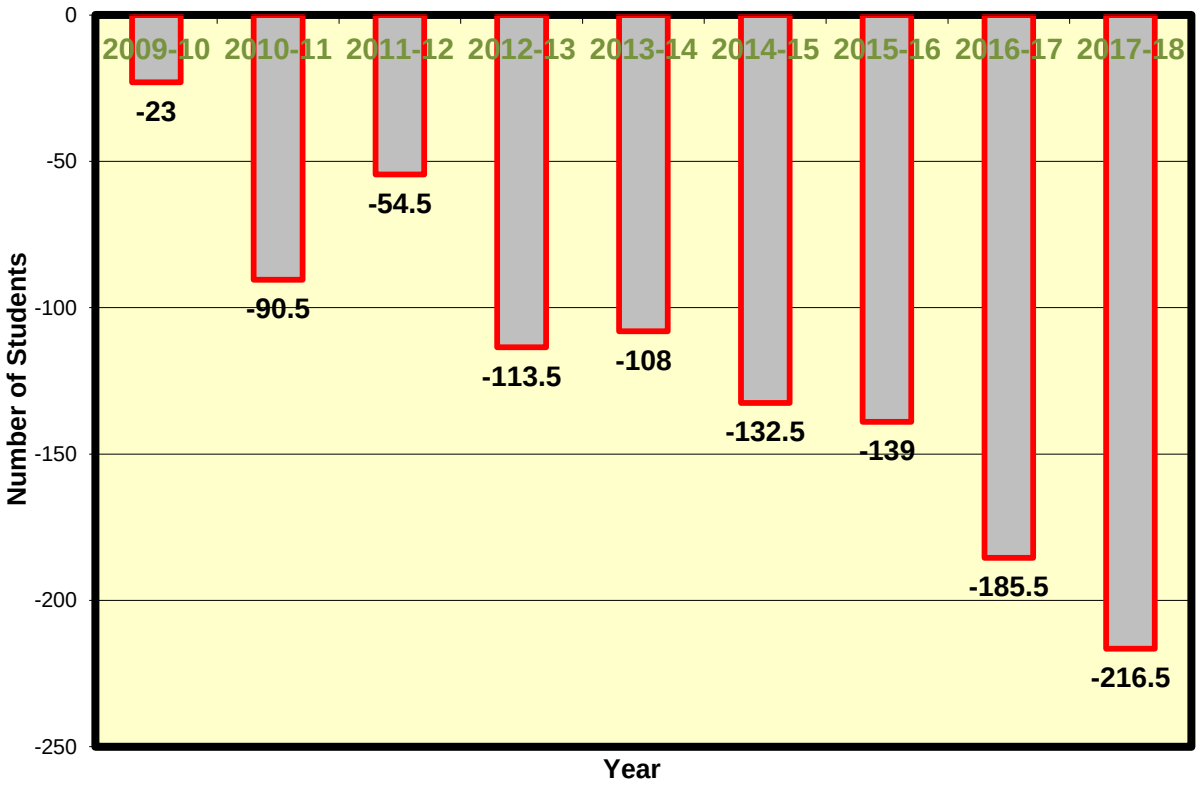
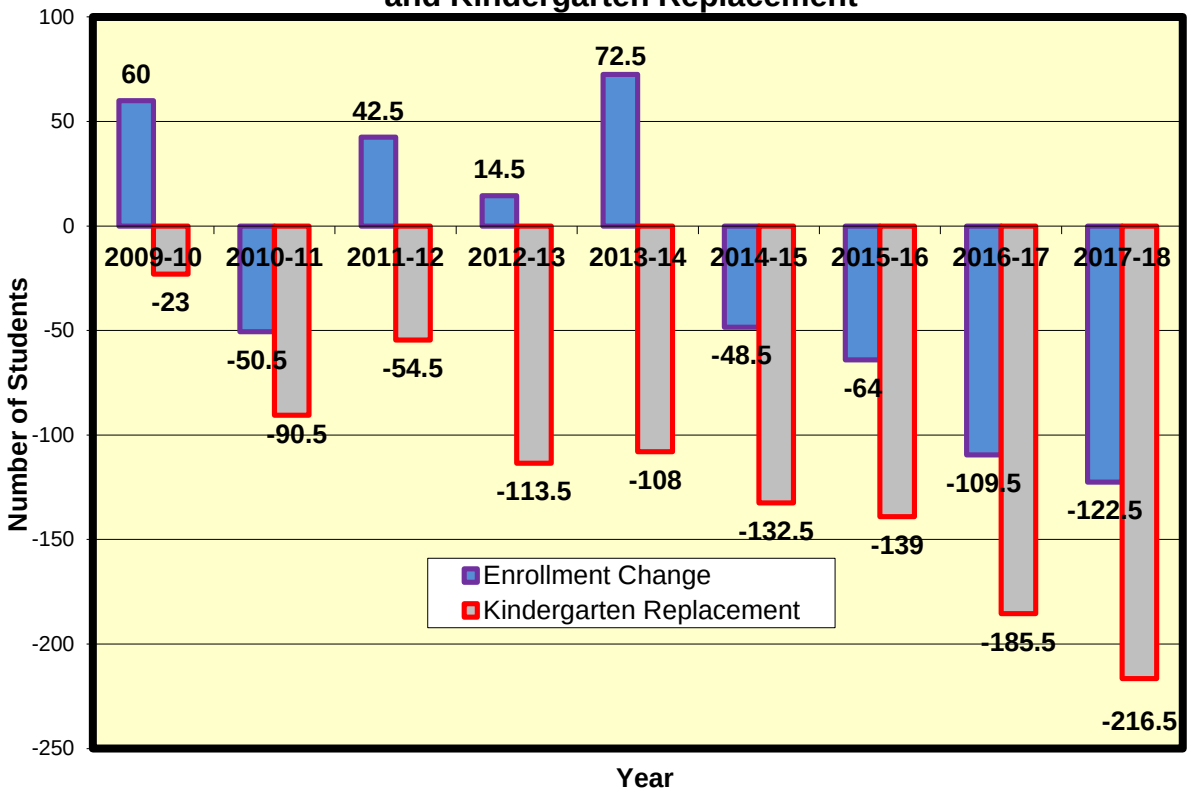


Figure 7 shows the annual change in total enrollment compared to kindergarten replacement. As the figure demonstrates, there appears to be a strong relationship, statistically speaking, between the overall change in enrollment and kindergarten replacement. Although this data represents a small sample, the correlation coefficient between the two variables was 0.84. Correlation coefficients measure the relationship or association between two variables; this does not imply that there is cause and effect between the two variables. Other variables, known as lurking variables, may have an effect on the true relationship between kindergarten replacement and total enrollment change. Negative correlation coefficients indicate that as one variable is increasing (decreasing), the other variable is decreasing (increasing). Positive correlation coefficients indicate that as one of the variables increases (decreases), the other variable increases (decreases) as well. The computed linear correlation coefficient is always between –1 and +1. Values near -1 or +1 indicate a strong linear relationship between the variables while values near zero indicate a weak linear relationship. Based on the correlation of 0.84, there appears to be a strong relationship between enrollment change and kindergarten replacement in the school district in the last nine years.

In each of the last nine years, the district's losses due to negative kindergarten replacement were partially offset (or totally, resulting in a net enrollment gain) by a net inward migration of students in the other grades (K to 1, 1 to 2, 2 to 3, etc.). This was confirmed previously as ten of the thirteen average survival ratios in the five-year trend were above 1.000.

Figure 7
Comparison of PK-12 Enrollment Change and Kindergarten Replacement



Birth Data

Birth data were needed to compute kindergarten enrollments, which were calculated as follows. Birth data, which are lagged five years behind their respective kindergarten classes, were used to calculate the survival ratio for each birth-to-kindergarten cohort. For instance, in 2012, there were a total of 192 births in Bernards. Five years later (the 2017-18 school year), 267 children enrolled in kindergarten, which is equal to a survival ratio of 1.391 from birth to kindergarten. Birth counts and birth-to-kindergarten survival ratios are displayed in Table 5. Values greater than 1.000 indicate that some children are born outside of a community's boundaries and are attending kindergarten in the school district five years later, i.e. an inward migration of children. This type of inward migration is typical in school districts with excellent reputations, because the appeal of a good school district draws families into the community. Inward migration is also seen in communities where there are a large number of new housing starts (or home resales), with families moving into the community having children of age to attend kindergarten. Birth-to-kindergarten survival ratios that are below 1.000 indicate that a number of children born within a community are not attending kindergarten in the school district five years later. This is common in communities where a high proportion of children attend private, parochial, or out-of-district special education facilities, or where there is a net migration of families moving out of the community. It is also common in school districts that have a half-day kindergarten program where parents choose to send their child to a private full-day kindergarten for the first year. In the last ten years, birth-to-kindergarten survival ratios have been well above 1.000. In the last six years, birth-to-kindergarten survival ratios have been relatively constant, ranging from 1.304-1.467.

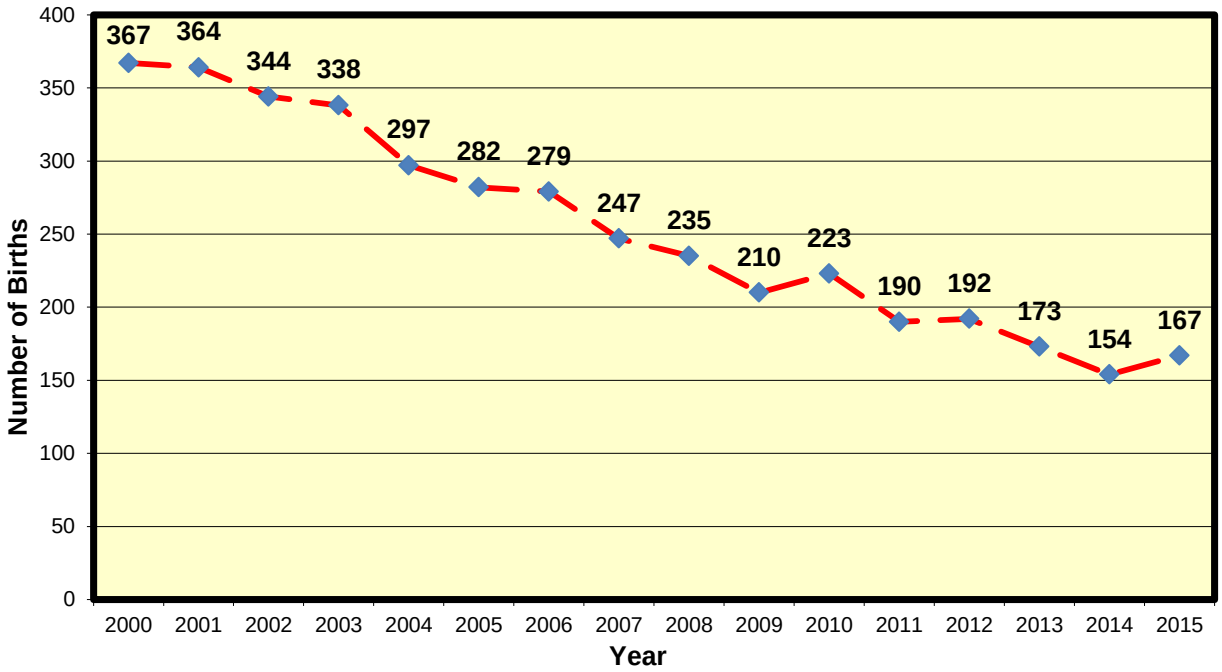
Table 5
Birth Counts and Historical Birth-to-Kindergarten Survival Ratios in the Bernards Township School District

Birth Year[1]	Number of Births Bernards Township	Kindergarten Students 5 Years Later	Birth-to-Kindergarten Survival Ratio
2003	338	354	1.047
2004	297	374	1.259
2005	282	334	1.184
2006	279	342	1.226
2007	247	322	1.304
2008	235	314	1.336
2009	210	308	1.467
2010	223	311	1.395
2011	190	273	1.437
2012	192	267	1.391
2013	173	N/A	N/A
2014	154	N/A	N/A
2015	167	N/A	N/A

Note: [1]Birth data were provided by the New Jersey Center for Health Statistics from 2003-2015.

Geocoded birth data were provided by the New Jersey Center for Health Statistics ("NJCHS") from 2000-2015 by assigning geographic coordinates to a birth mother based on her street address. Births for 2016 were not yet available. As shown in Figure 8, the number of births in Bernards has been generally declining. A longer historical period is shown, as compared to that shown in Table 5, to demonstrate the declining birth rate in the township. Births have declined from 367 in 2000 to 167 in 2015. As a result, kindergarten enrollment has declined from a high of 374 in 2009 to a low of 267 in 2017, which is not as large as the decline in the birth count. The inward migration of families with children under the age of five has reduced the potential impact of the declining birth count on the kindergarten enrollment. It appears that the birth count in Bernards may be stabilizing, as the number of births increased in 2015. However, several additional years of data will be necessary to determine if a change in trend has occurred.

Figure 8
Bernards Township Historical Birth Counts
2000-2015



Using mapping software, elementary school attendance area boundaries, and NJCHS birth data by Census blocks, the number of births from 2003-2015 was determined for each elementary school attendance area and is displayed in Table 6. In some instances, the address of the mother within Bernards was unknown. The greatest number of unknown births (n = 12) occurred in 2010. For the purposes of projecting enrollments, the unknown births were redistributed into the four elementary attendance areas using proportional allocations of the births in each school attendance area with respect to the total number of births.

For comparison purposes, Figures 9 and 10 show the number of births by elementary attendance area in 2003 and 2015. In 2003, the greatest number of births (103) occurred in the Liberty Corner attendance area. However, in 2015, the number of births in the Cedar Hill,

Liberty Corner, and Oak Street attendance areas were nearly identical (43-45 births) yet were substantially lower than 2003.

Table 6
Births by Elementary School Attendance Area in the Bernards Township School District 2003-2015

Birth Year	Cedar Hill	Liberty Corner	Mount Prospect	Oak Street	Unknown
2003	65	103	80	88	2
2004	73	94	60	69	1
2005	62	72	71	75	2
2006	58	85	44	84	8
2007	59	81	39	62	6
2008	61	71	41	56	6
2009	59	70	31	40	10
2010	51	77	38	45	12
2011	59	62	27	34	8
2012	51	62	47	27	5
2013	54	51	26	40	2
2014	36	57	23	35	3
2015	45	44	33	43	2
Total 2003-2015	**733**	**929**	**560**	**698**	
Difference 2003-2015	**-20**	**-59**	**-47**	**-45**	

Figure 11 shows the differences in the birth counts by attendance area from 2003-2015. Each of the attendance areas had fewer births in 2015 as compared to 2003. The southern part of Bernards, represented by the Liberty Corner attendance area, had the largest decline (-59) in the annual number of births over this time period while the Cedar Hill attendance area had the smallest decline. Finally, Figure 12 shows the aggregated number of births by attendance area from 2003-2015. The Liberty Corner attendance area had the greatest number of births over this time period while the Mount Prospect attendance area had the fewest.

In addition, since there are only four elementary attendance areas in the school district, it is difficult to determine the specific location(s) where birth counts are changing. To show these locations, maps of births by census block were created for 2003 and 2015 and are shown in Figures 13 and 14. Census blocks are the smallest geographic unit in which data are collected by the Census Bureau. Blocks are typically bound by streets, roads, or bodies of water. These maps provide greater detail of the locations where most of the births are occurring. In 2003, the greatest number of births, which are magenta or purple, occurred mostly in the southwest, corresponding to where The Hills is located. Another area having a large number of births was in the southeast section of Bernards where the Cedars at Basking Ridge and Society Hill at Bernards are located. However, in 2015, none of the blocks were shaded magenta or purple (using the same scale), signifying the birth rate decline in Bernards.

Figure 9
Bernards Township Births by Elementary Attendance Area
2003

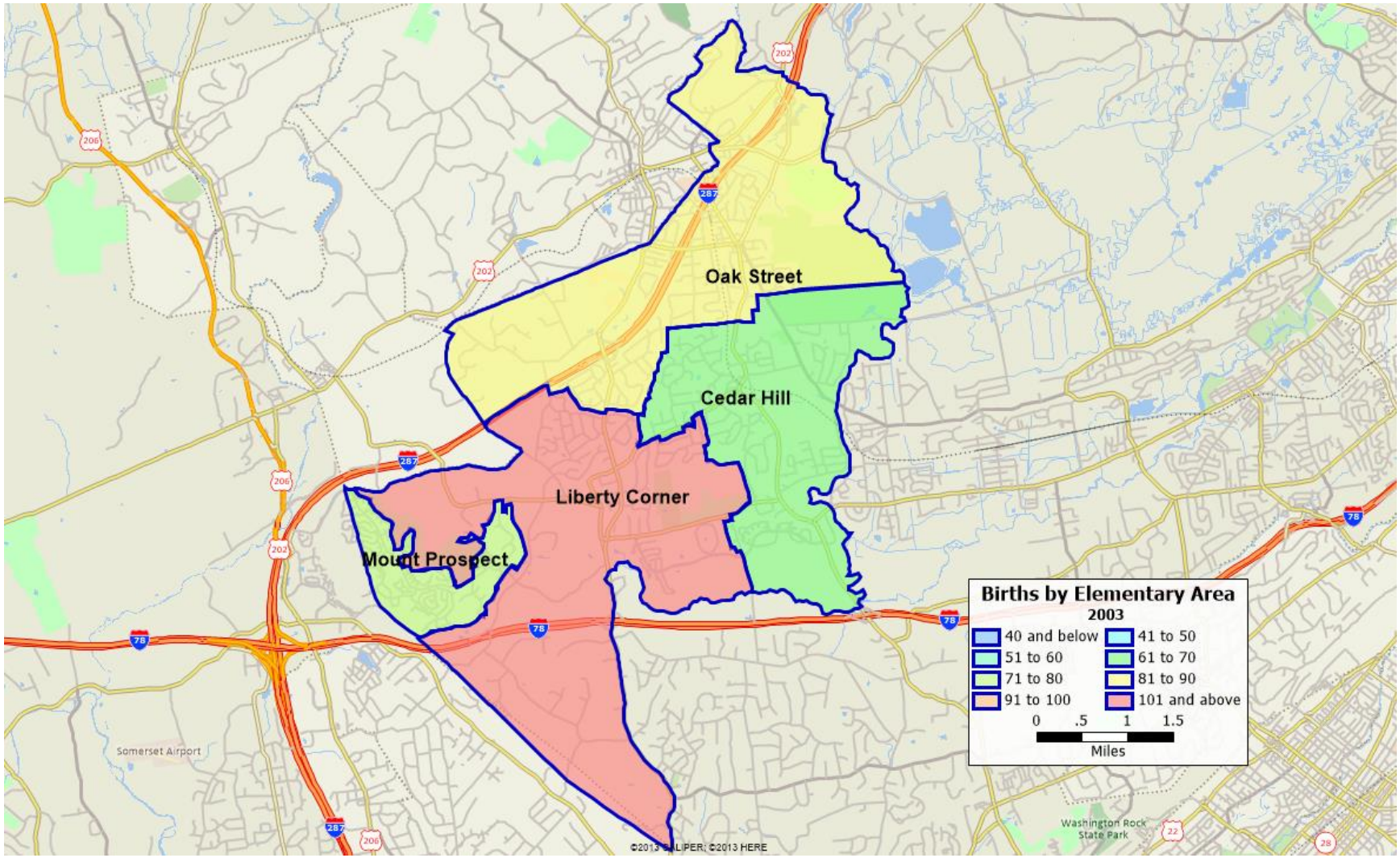


Figure 10
Bernards Township Births by Elementary Attendance Area
2015

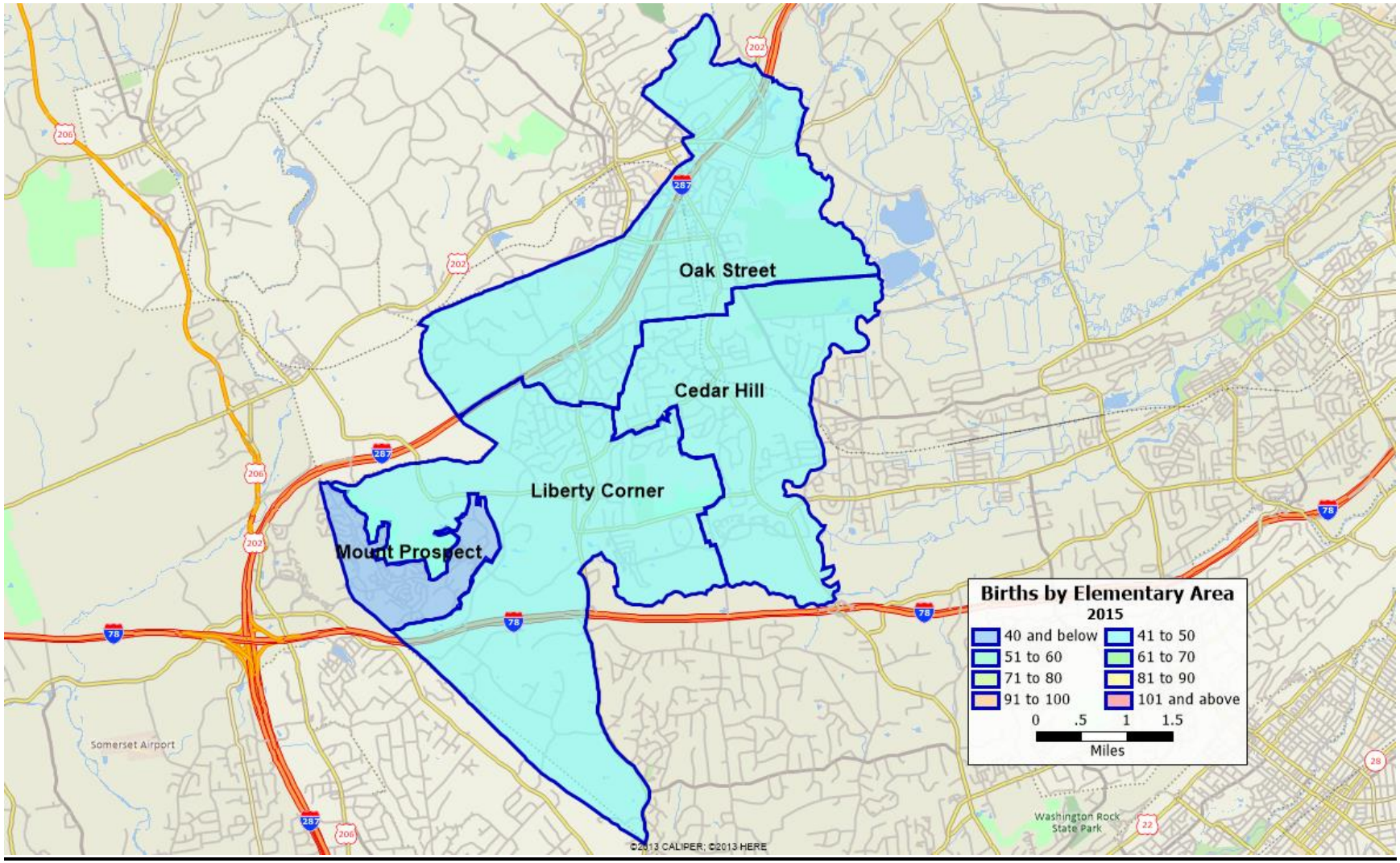


Figure 11
Bernards Township Change in the Number of Births by Elementary Attendance Area
2003-2015

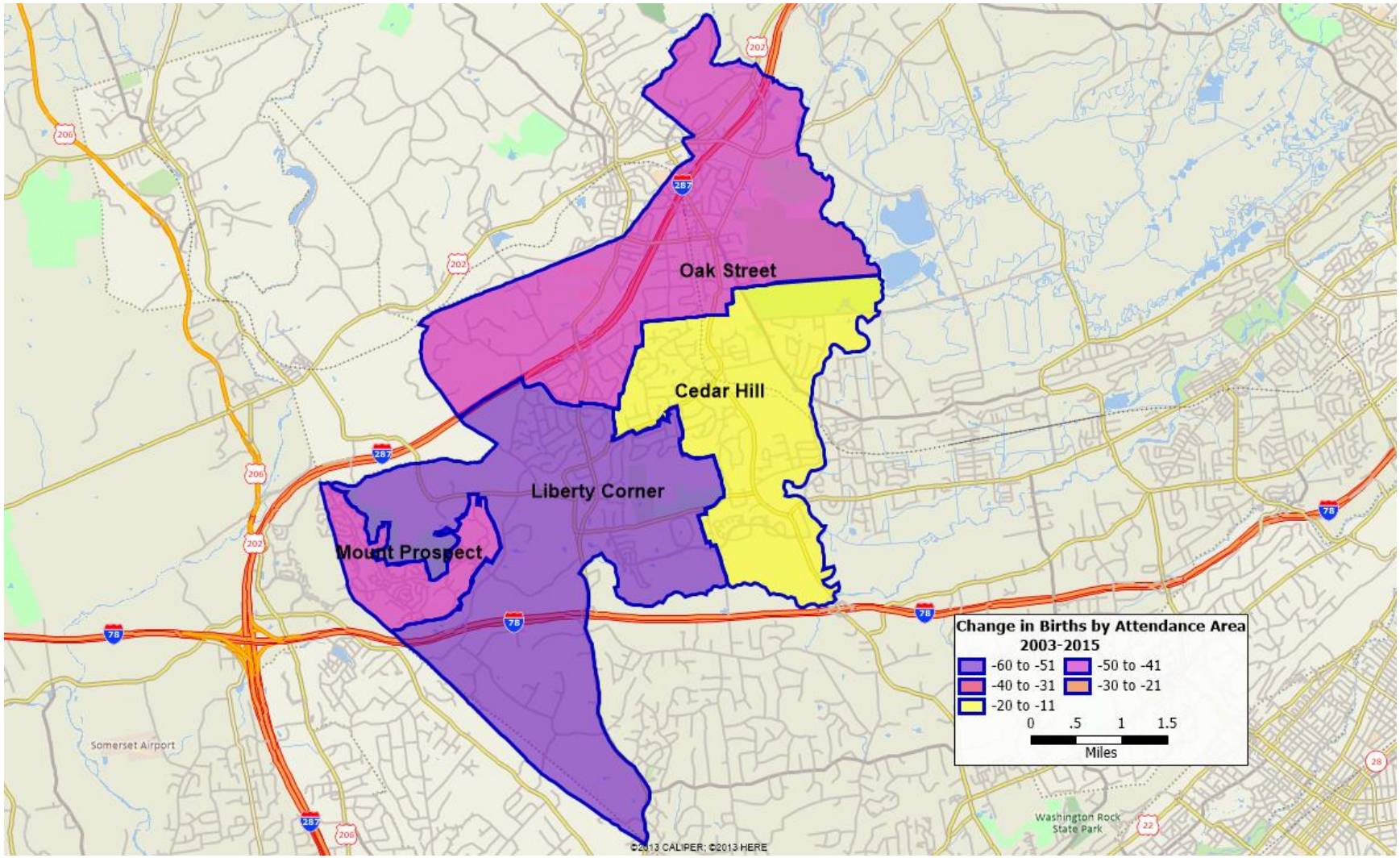


Figure 12
Bernards Township Total Number of Births by Elementary Attendance Area
2003-2015

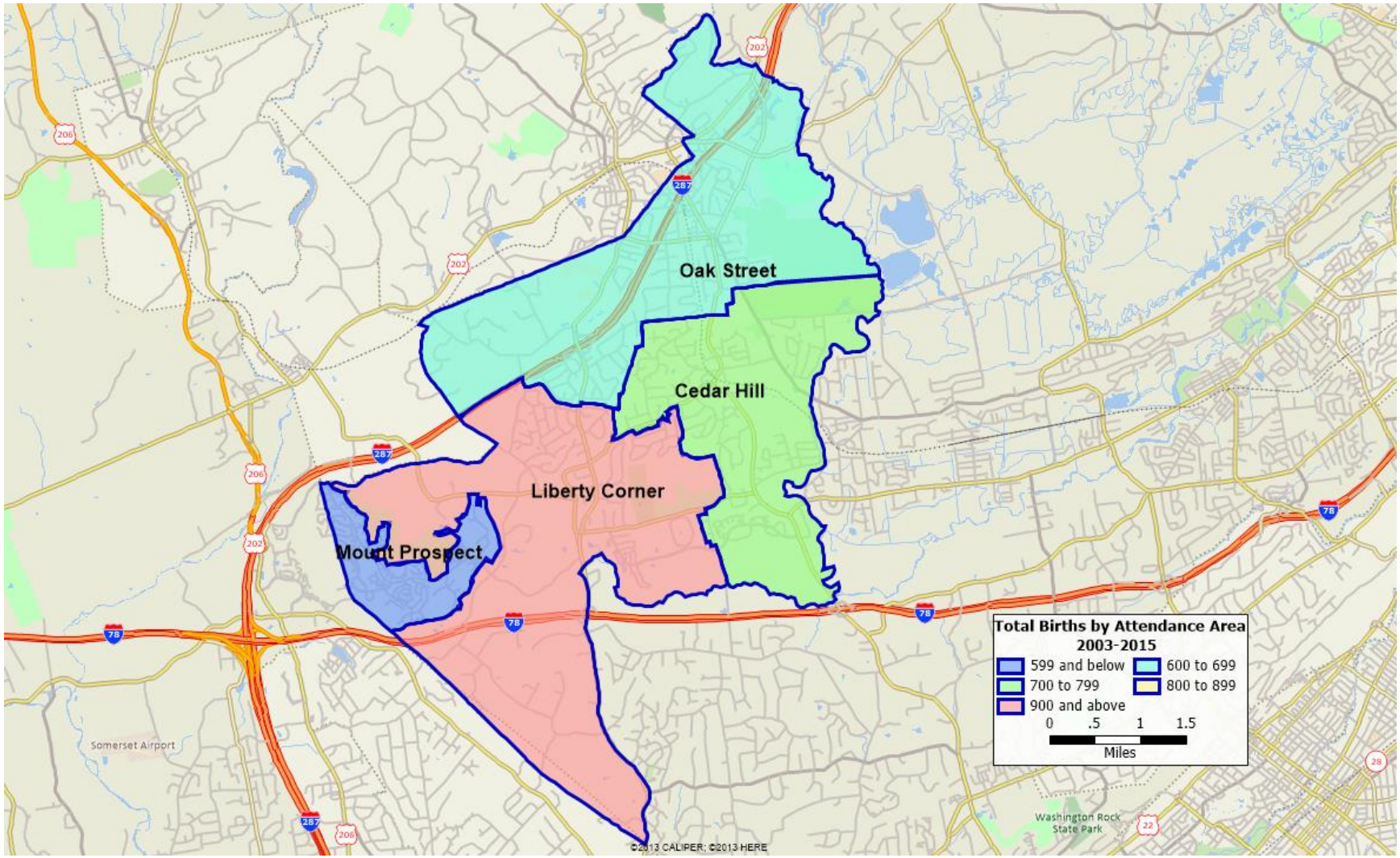


Figure 13
Bernards Township Births by Census Block
2003

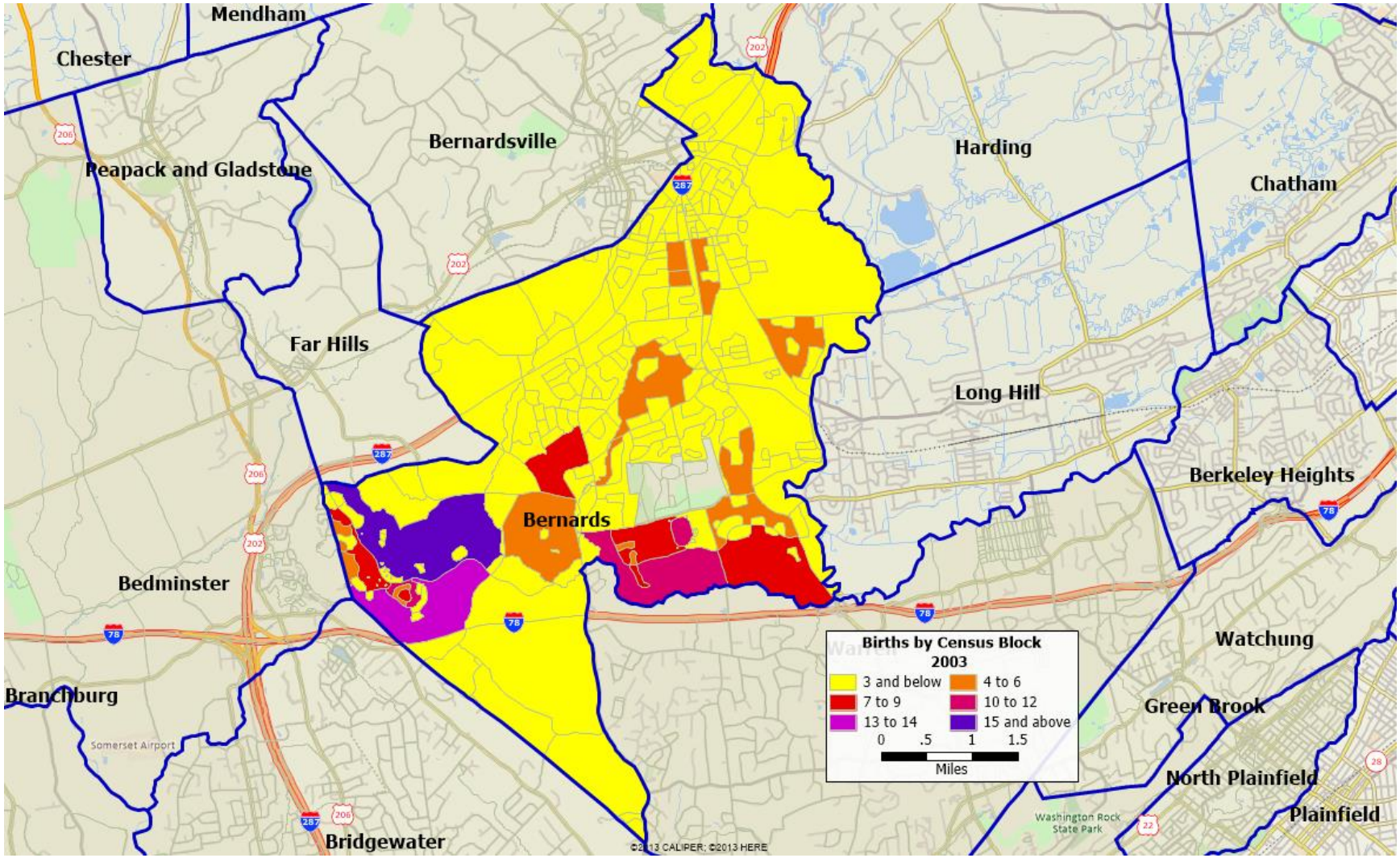
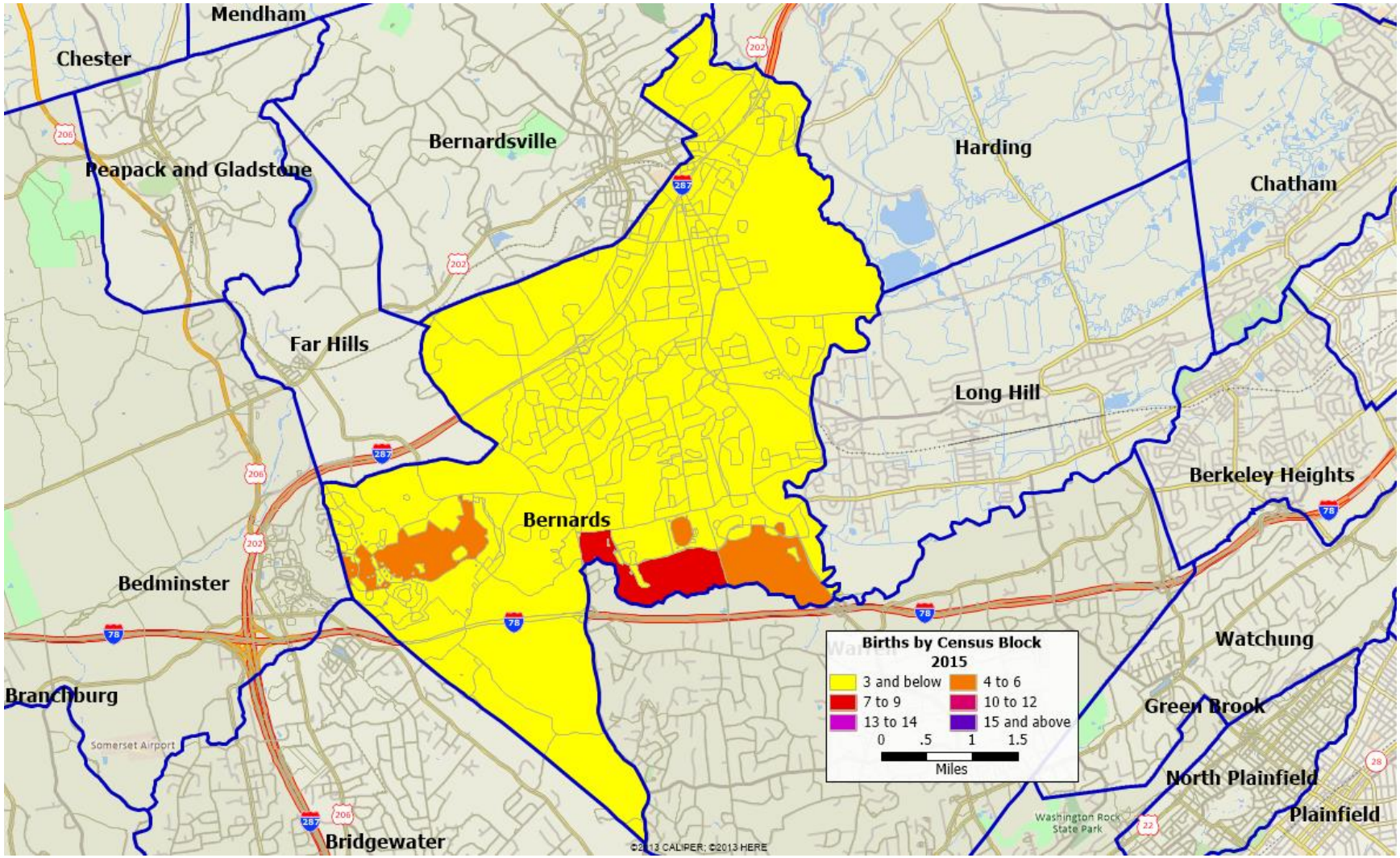


Figure 14
Bernards Township Births by Census Block
2015



The fertility rate in Bernards is below the rate in both Somerset County and the State of New Jersey. According to the 2011-2015 ACS, the fertility rate of women aged 15 to 50 in Bernards was 47 births per 1,000 women. In comparison, as reported by the NJCHS, the 2015 fertility rate in Somerset County was 53.9 births per 1,000 women (ages 15-49) and was 59.5 births per 1,000 women in New Jersey. However, it should be noted that while the municipal, county, and state data are all based on a sample, the municipal data has a margin of error that is much higher than the county and state data and may not reflect the "true" fertility rate in the community.

Figures 15 and 16 show the age pyramids of males and females in Bernards from both the 2000 and 2010 Censuses. The largest number of individuals in 2000 was aged 40-44 for males and 35-39 for females. As these individuals advance in age, the largest cohort in 2010 was aged 45-49 for both genders (however, it should be noted that the 10-14 age group for males was nearly as large). As shown in Table 7, the greatest declines (shaded red), both in number and percentage points, occurred in the 35-39 age group for both genders. There were also significant declines in the 25-29 and 30-34 age groups for females, which correspond to the ages when many females have their children. The greatest gains (shaded blue), both in number and percentage points, occurred in the 15-19 age group for males and 45-49 age group for females. There were also significant gains in the 15-19 age group for females and 10-14 age group for both genders, which have likely led to the recent enrollment increase at Ridge. The combination of low fertility rates and a declining number of females in the 25-29, 30-34, and 35-39 age groups have likely led to the declining birth rate in Bernards.

Figure 15
Population Pyramid of Bernards Township
2000 Census

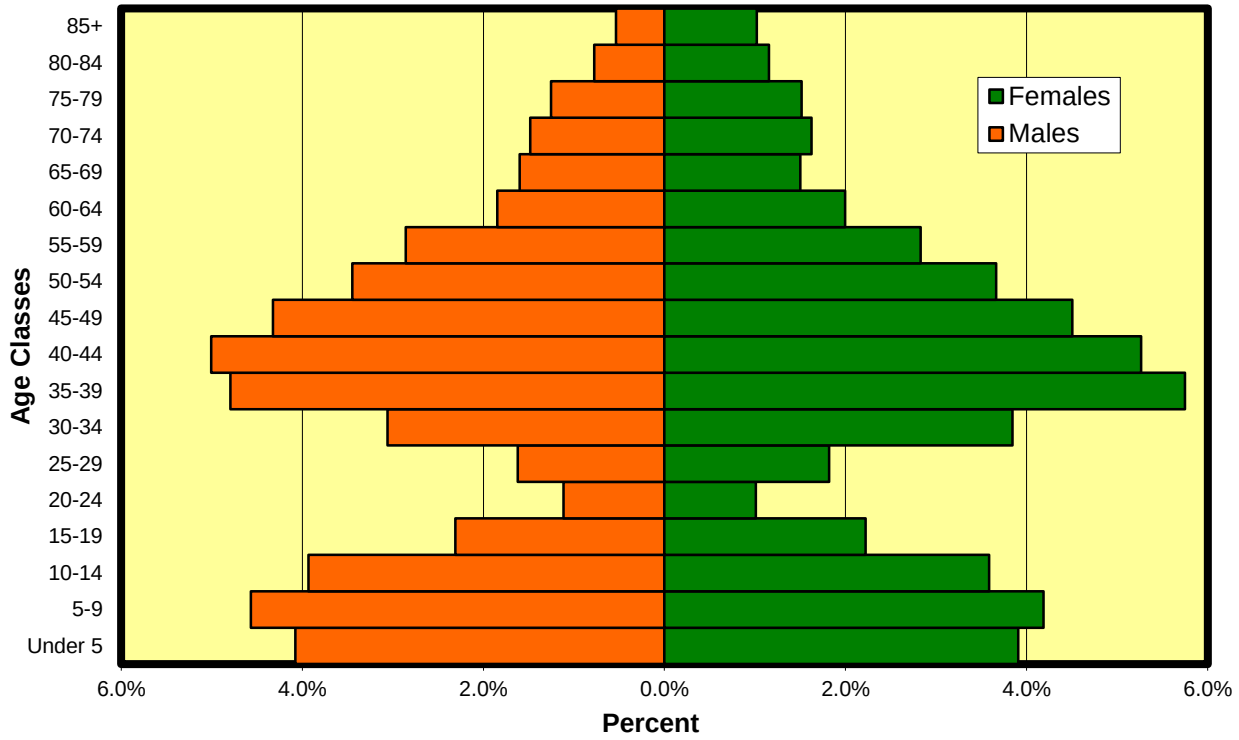


Figure 16
Population Pyramid of Bernards Township
2010 Census

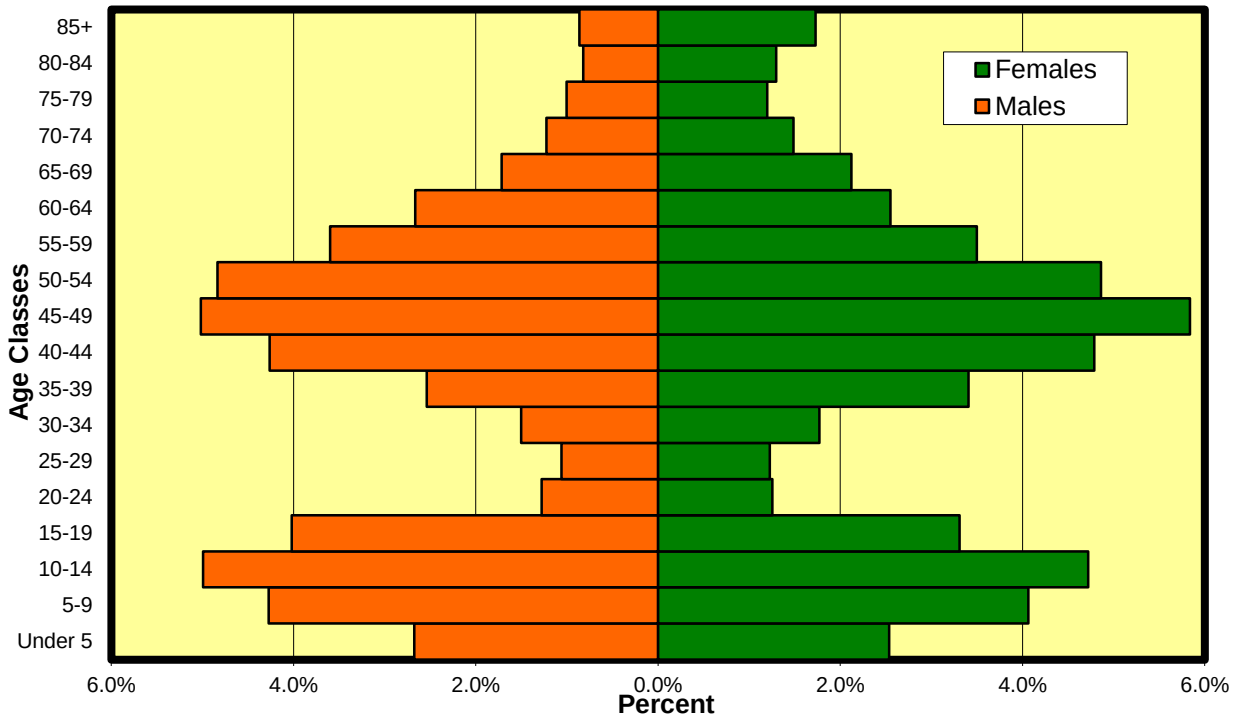


Table 7

Numerical and Percentage Point Change of Males and Females in Bernards 2000 to 2010

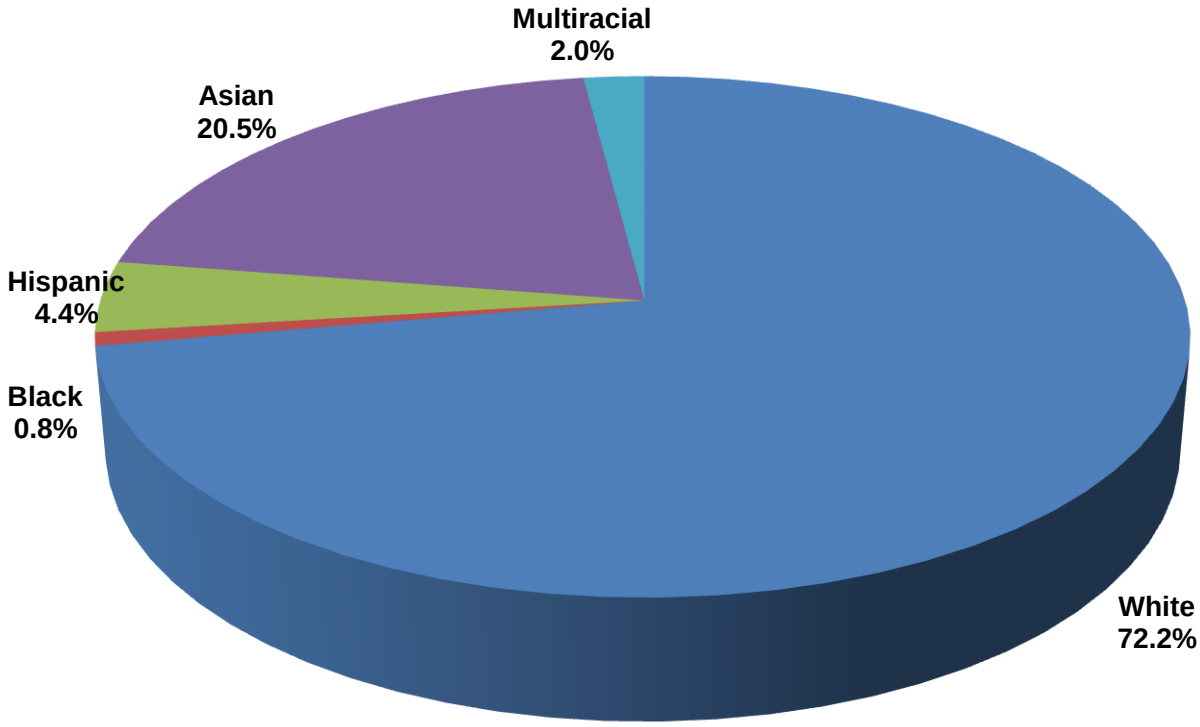
	Males		Females	
Age Group	**Numerical Change**	**Percentage Point Change**	**Numerical Change**	**Percentage Point Change**
Under 5	-289	-1.4	-284	-1.4
5-9	+16	-0.3	+54	-0.1
10-14	+365	+1.1	+377	+1.1
15-19	+503	+1.7	+336	+1.1
20-24	+66	+0.2	+87	+0.2
25-29	-116	-0.6	-120	-0.6
30-34	-352	-1.6	-473	-2.1
35-39	-502	-2.3	-505	-2.3
40-44	-94	-0.7	-18	-0.5
45-49	+274	+0.7	+449	+1.3
50-54	+441	+1.4	+396	+1.2
55-59	+257	+0.7	+238	+0.7
60-64	+256	+0.8	+190	+0.6
65-69	+64	+0.1	+197	+0.6
70-74	-38	-0.3	-3	-0.1
75-79	-41	-0.3	-52	-0.3
80-84	+28	0.0	+62	+0.1
85+	+98	+0.3	+210	+0.7

Notes: Cells shaded blue reflect the greatest gains over the ten-year period.
Cells shaded red reflect the greatest losses over the ten-year period.

Historical Enrollments by Race

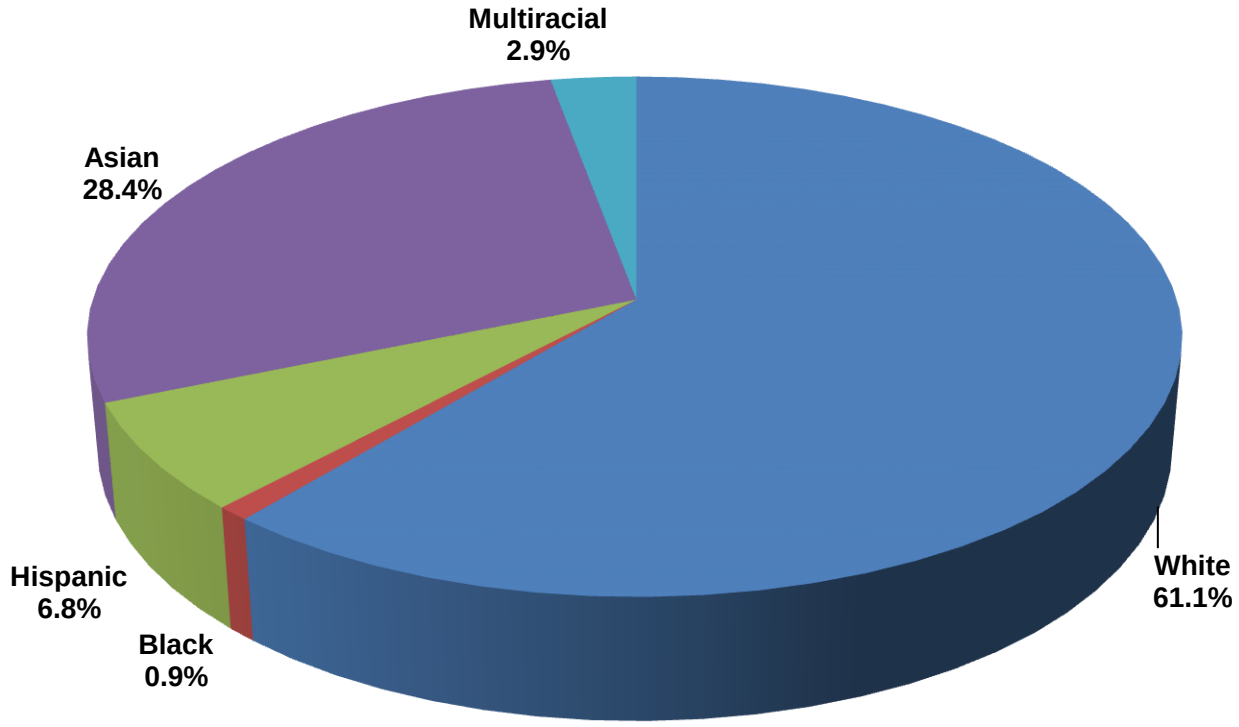
In Figure 17 below, the 2012-13 total enrollment is shown by race for the Bernards Township School District. In the NJDOE enrollment database, the races listed are White, Hispanic/Latino ("Hispanic"), Asian or Native Hawaiian/Other Pacific Islander ("Asian"), Black or African American ("Black"), Native American or Alaska Native, and Two or more races ("Multiracial"). The number and percentage of Native American or Alaska Native students in the district were insignificant. As the chart shows, the district's largest race in 2012-13 was White (72.2%) and Asian (20.5%), who accounted for nearly 93% of the student population.

Figure 17
Bernards Township School District Enrollment by Race
2012-13



In Figure 18 below, the 2017-18 total enrollment is shown by race for the Bernards Township School District. Whites are still the majority race in the district, consisting of 61.1% of the student population. However, the percentage of Whites has declined by 11.1 percentage points since 2012-13. Asians make up a larger share of the population, 28.4%, in 2017-18, which is a gain of 7.9 percentage points from 2012-13. The percentages of Hispanic and Multiracial students have increased slightly (2.4 and 0.9 percentage points respectively) while the percentage of Black students has remained nearly constant. The number and percentage of Native American or Alaska Native students in the district were insignificant.

Figure 18
Bernards Township School District Enrollment by Race
2017-18



In Table 8, enrollments by race from 2012-13 are displayed for each of the schools in the district, as well as the districtwide totals. The largest race in each school is shaded blue. At the elementary level, Whites were the largest race in each school, although the percentage of Whites and Asians at Mount Prospect was nearly identical. The White percentage ranged from a low of 45.5% at Mount Prospect to a high of 85.5% at Oak Street. The Asian percentage ranged from a low of 5.8% at Oak Street to a high of 44.8% at Mount Prospect. The greatest percentage of Hispanics (6.1%) was at Oak Street, although the percentage was fairly similar at each school, ranging from 5-6%. Of the four major racial subgroups, Blacks are the smallest at each elementary school, ranging from 0.3%-1.5% of the student population in each school.

At Annin, Whites were the largest race (72.0%) in 2012-13 while Asians were the second largest racial subgroup (22.3%).

At Ridge, Whites were the largest racial subgroup in 2012-13, representing 76.8% of the population, while Asians were second-largest (17.5%).

Table 8
Enrollments by Race and School in the Bernards Township School District 2012-13

School	White	Black	Hispanic	Asian	Multiracial	Alaska Native/ Native American	Total
Cedar Hill E.S.	442	9	30	94	11	0	**586**
	75.4%	1.5%	5.1%	16.0%	1.9%	0.0%	**100.0%**
Liberty Corner E.S.	430	5	34	98	24	0	**591**
	72.8%	0.8%	5.8%	16.6%	4.1%	0.0%	**100.0%**
Mount Prospect E.S.	312	2	38	307	25	1	**685**
	45.5%	0.3%	5.5%	44.8%	3.6%	0.1%	**100.0%**
Oak Street E.S.	519	2	37	35	14	0	**607**
	85.5%	0.3%	6.1%	5.8%	2.3%	0.0%	**100.0%**
William Annin M.S.	1015	11	51	314	18	0	**1,409**
	72.0%	0.8%	3.6%	22.3%	1.3%	0.0%	**100.0%**
Ridge H.S.	1382.5	18	60	315.5	24	1	**1,801**
	76.8%	1.0%	3.3%	17.5%	1.3%	0.1%	**100.0%**
Total	**4,100.5**	**47**	**250**	**1,163.5**	**116**	**2**	**5,679**
	72.2%	**0.8%**	**4.4%**	**20.5%**	**2.0%**	**0.0%**	**100.0%**

Source: New Jersey Department of Education (http://www.nj.gov/education/data/enr/)
Note: Cells highlighted blue are the largest race in the school.

In Table 9 following, enrollments by race from 2017-18 are displayed for each of the schools in the district, as well as the districtwide totals. The largest race in each school is shaded blue. At the elementary level, while Whites continue to be the largest race in Cedar Hill, Liberty Corner, and Oak Street, they are no longer the largest race in Mount Prospect. Each of the elementary schools had a percentage point decline in the White population with the largest occurring at Mount Prospect (-15.5). The White percentage ranges from a low of 30.0% at

Mount Prospect to a high of 74.6% at Oak Street. Asians are now the largest race at Mount Prospect, accounting for 58.2% of the school's population, which a 13.4 percentage point gain from 2012-13. The Asian percentage increased in all four elementary schools and ranges from a low of 11.0% at Oak Street to a high of 58.2% at Mount Prospect. With respect to Hispanics, the lowest percentage is in Liberty Corner (5.4%) and the highest is in Oak Street (9.0%). With the exception of Liberty Corner, each elementary school had a percentage point gain in the Hispanic population, with the largest occurring at Oak Street (+2.9). The Black percentage remained nearly constant in each school and continues to be the smallest racial subgroup. The Black percentage ranges from 0.4%-1.4% in each school.

At Annin, Whites are the largest race (61.5%) in 2017-18, which is a decline of 10.5 percentage points from 2012-13. Asians were the second largest racial subgroup at 27.9%, which is a gain of 5.6 percentage points from 2012-13.

At Ridge, Whites are the largest race (65.0%) in 2017-18, which is a decline of 11.8 percentage points from 2012-13. Asians are the second largest racial subgroup at 26.3%, which is a gain of 8.8 percentage points from 2012-13.

Table 9
Enrollments by Race and School in the Bernards Township School District 2017-18

School	White	Black	Hispanic	Asian	Multiracial	Alaska Native/ Native American	Total
Cedar Hill E.S.	375	7	45	141	25	0	**593**
	63.2%	1.2%	7.6%	23.8%	4.2%	0.0%	**100.0%**
Liberty Corner E.S.	353	2	29	130	22	0	**536**
	65.9%	0.4%	5.4%	24.3%	4.1%	0.0%	**100.0%**
Mount Prospect E.S.	179	4	49	347	16	1	**596**
	30.0%	0.7%	8.2%	58.2%	2.7%	0.2%	**100.0%**
Oak Street E.S.	365	7	44	54	19	0	**489**
	74.6%	1.4%	9.0%	11.0%	3.9%	0.0%	**100.0%**
William Annin M.S	824	9	86	373	46	1	**1,339**
	61.5%	0.7%	6.4%	27.9%	3.4%	0.1%	**100.0%**
Ridge H.S	1206	18	114	488	28	0	**1,854**
	65.0%	1.0%	6.1%	26.3%	1.5%	0.0%	**100.0%**
Total	**3,302**	**47**	**367**	**1,533**	**156**	**2**	**5,407**
	61.1%	**0.9%**	**6.8%**	**28.4%**	**2.9%**	**0.0%**	**100.0%**

Source: New Jersey Department of Education (http://www.nj.gov/education/data/enr/) and the Bernards Township School District

Note: Cells highlighted blue are the largest race in the school.

Economically Disadvantaged Students

As a proxy for measuring poverty in the school district, counts of students receiving free or reduced lunch ("economically disadvantaged") were compiled from 2012-13 through 2017-18. Districtwide, only 81 children were disadvantaged in 2012-13, which represents 1.4% of the student population. Figure 19 below partitions the district's total number of students that were economically disadvantaged by school in 2012-13. Nearly one-third (32.1%) of the district's economically disadvantaged population attended Ridge, which is not surprising as it is the largest school in the district. At the elementary school level, Oak Street had the greatest percentage (19.8%) of the district's economically disadvantaged population while Mount Prospect had the smallest percentage (2.5%).

Figure 19
Bernards Township School District
Economically Disadvantaged by School
2012-13

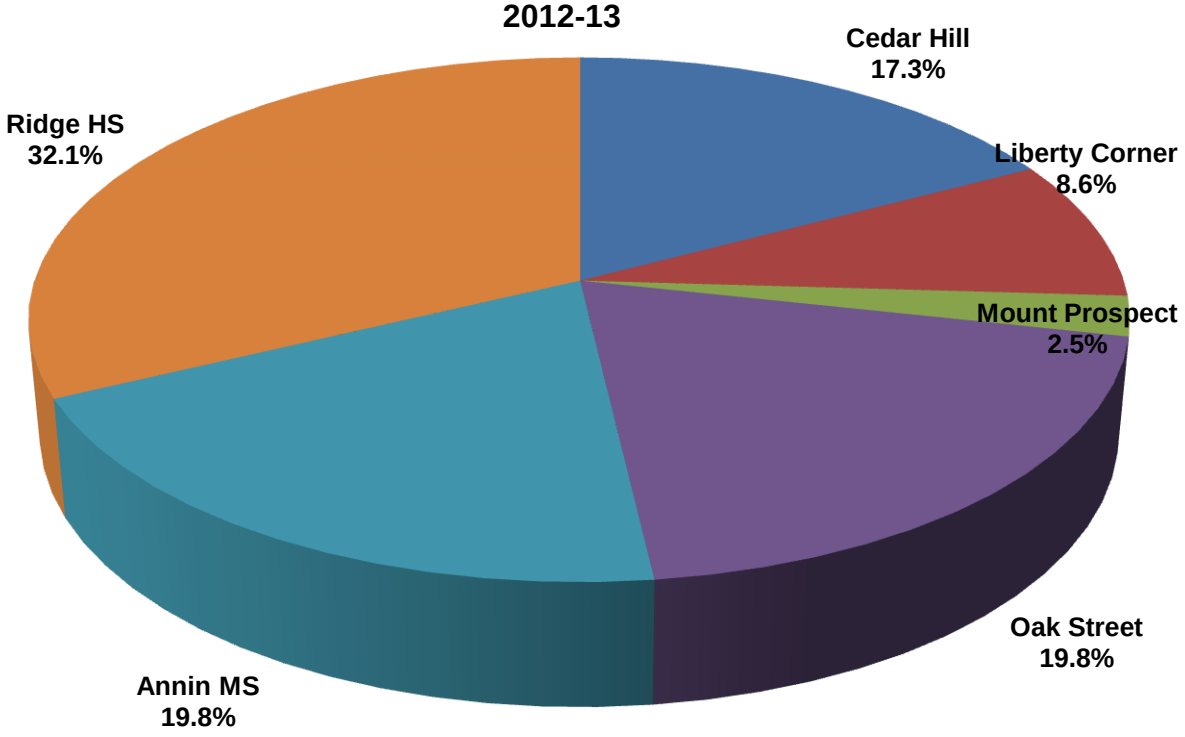
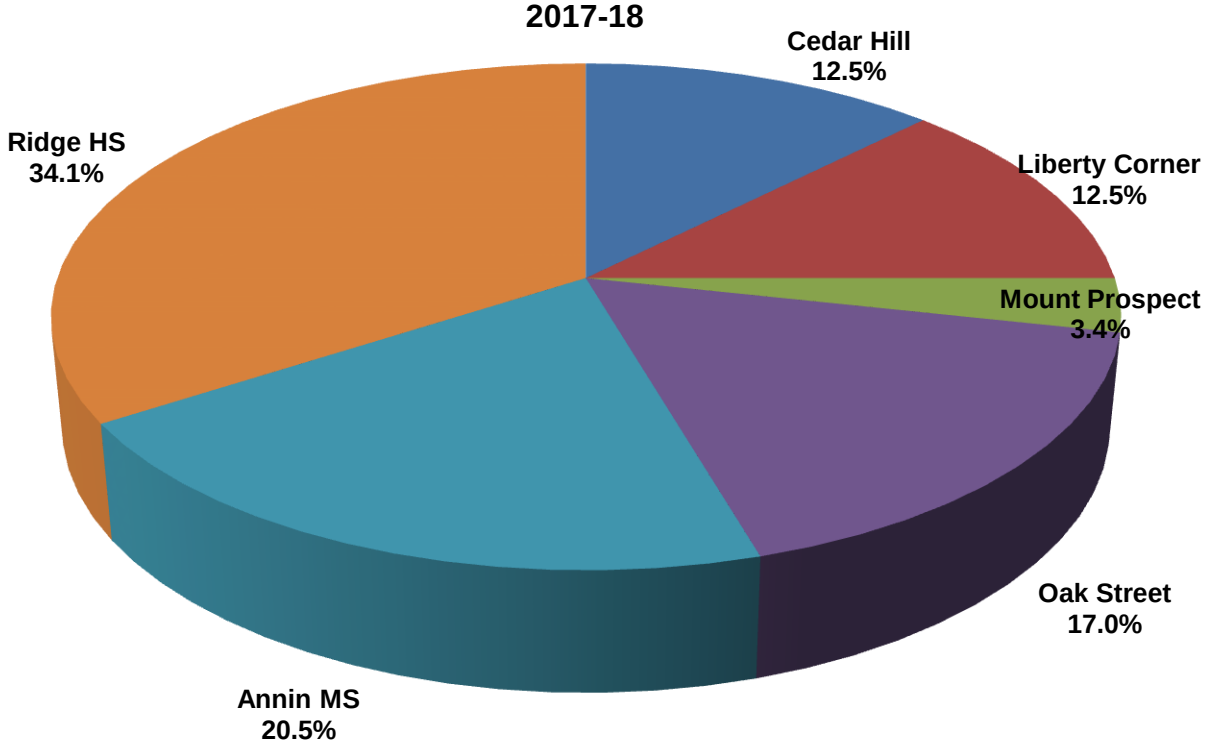


Figure 20 below partitions the district's total number of students that are economically disadvantaged by school in 2017-18. Districtwide, only 88 children are economically disadvantaged in 2017-18, which represents 1.6% of the student population. More than one-third (34.1%) of the district's economically disadvantaged population attends Ridge, which is a 2.0 percentage point gain from 2012-13. At the elementary level, Oak Street has the greatest percentage (17.0%) of the district's economically disadvantaged population while Mount Prospect has the smallest percentage (3.4%). Numerically, there is little difference in the number of economically disadvantaged students over the time period. There was greater variation in the percentages since the number of economically disadvantaged students in each school was rather small and the loss or gain of just a few economically disadvantaged students had a significant impact on the percentages.

Figure 20
Bernards Township School District
Economically Disadvantaged by School
2017-18



Since the size of the school often dictates the percentage of the district's apportioned economically disadvantaged population, the total number of economically disadvantaged students was compiled by school (Table 10) from 2012-13 through 2017-18 as well as the *within school* percentages (Table 11). Table 10 also shows the overall percentage of students that are economically disadvantaged with respect to the district's total enrollment and the change in the number of students that are economically disadvantaged over this time period for each school. At the district level, the number and percentage of students that are economically disadvantaged increased through 2014-15 before declining. Most of the gain over this period occurred at Annin and Ridge. Whereas 81 students (1.4%) were economically disadvantaged in the school district in 2012-13, the number increased slightly to 88 (1.6%) in 2017-18, a gain of seven (7) economically disadvantaged students despite a decline of 272 students in the overall student population. Each of the schools in the district had a similar number of economically disadvantaged students in 2017-18 as compared to 2012-13.

Table 10
Bernard Township School District Economically Disadvantaged Students
2012-13 to 2017-18

School	2012-13	2013-14	2014-15	2015-16	2016-17	2017-18	Change
Cedar Hill E.S.	14	10	16	14	13	11	**-3**
Liberty Corner E.S.	7	16	13	12	7	11	**+4**
Mount Prospect E.S.	2	4	6	6	3	3	**+1**
Oak Street E.S.	16	16	23	23	12	15	**-1**
William Annin M.S.	16	26	30	15	15	18	**+2**
Ridge H.S.	26	23.5	43	35	32	30	**+4**
Total	**81**	**95.5**	**131**	**105**	**82**	**88**	**+7**
Total District Enrollment	**5,679**	**5,752**	**5,703**	**5,639**	**5,529.5**	**5,407**	
Percent of Total	**1.4%**	**1.7%**	**2.3%**	**1.9%**	**1.5%**	**1.6%**	

Source: New Jersey Department of Education (http://www.nj.gov/education/data/enr/) and the Bernards Township School District

The percentages of students that are economically disadvantaged *within each school* from 2012-13 through 2017-18 are shown in Table 11. At the elementary level, the percentage of students who are economically disadvantaged was very low in 2017-18, ranging from 1-3%. There was little variation in the percentages in each school over this time period.

At Annin, the percentage of economically disadvantaged students peaked in 2014-15 before declining. Over the six-year period, percentages ranged from 2.7%-5.1%.

At Ridge, the percentage of economically disadvantaged students also peaked in 2014-15 before declining. Over the six-year period, percentages ranged from 6.2%-10.9%, which is the highest of any school in the district.

Table 11
Bernard Township School District Economically Disadvantaged Students Within School Percentages 2012-13 to 2017-18

	2012-13	2013-14	2014-15	2015-16	2016-17	2017-18	Percentage Point Change
Cedar Hill E.S.	2.4%	1.7%	2.8%	2.6%	2.5%	2.2%	**-0.2**
Liberty Corner E.S.	1.9%	4.2%	3.5%	3.1%	1.9%	3.3%	**+1.4**
Mount Prospect E.S.	0.5%	0.9%	1.4%	1.5%	0.8%	0.8%	**+0.3**
Oak Street E.S.	3.8%	3.4%	4.7%	5.2%	2.9%	3.3%	**-0.5**
William Annin M.S.	2.8%	4.6%	5.1%	2.7%	2.7%	3.1%	**+0.4**
Ridge H.S.	6.7%	6.2%	10.9%	8.7%	8.2%	8.2%	**+1.4**

New Housing in Bernards Township

Representatives from Bernards provided information regarding potential residential development in the township. As shown in Table 12, there is the potential for 434 housing units. The first potential project is the redevelopment of the former Dewy Meadow Shopping Center ("Dewy Meadow"), which would consist of 198 rental units in a mix of apartments and townhouses. Thirty (30) apartment units will be set aside to meet affordable housing requirements.

The second potential development is the redevelopment of the Millington Quarry ("Quarry"), which would be a mixed use development consisting of residential, retail, commercial, and a hotel/restaurant. With respect to the residential component, a total of 200 units are proposed in a mix of detached single-family homes, apartments, townhouses, and flats. Additional units will be constructed to meet affordable housing requirements; however, the number of units is unknown.

Table 12
Potential Residential Developments in Bernards Township

Subdivision/ Developer	Elementary Attendance Areas	Number of Units	Housing Type	Notes
Dewy Meadow	Cedar Hill	198	Apartment/ Townhouse Rental Units	Residential development to be located at former Dewy Meadow Shopping Center. 144 apartment units of which 30 would be set aside for Low-Moderate Income households. 54 Townhouse rental units Likely to be completed in 2-2 ½ years
Quarry	Cedar Hill	200	Detached Single- Family Townhouse Flats Apartment	Cottage Residential: 47 SF detached and 28 Townhouses Mixed Residential: 30 Flats and 45 Townhouses Mixed Use: 50 Apartments
Crown Court	Cedar Hill	24	Apartment	24 rental apartment units of which four (4) would be set aside for Low-Moderate Income households.
Mine Brook Farm	Liberty Corner	12	Detached Single-Family	Under construction
Total		**434**		

Source: Mr. Bruce McArthur, Bernards Township Administrator

In the existing Crown Court development on Monarch Circle, an additional 24 rental apartment units are planned. Four (4) apartment units will be set aside to meet affordable housing requirements.

A fourth development, Mine Brook, will consist of twelve (12) detached single family homes and is currently under construction.

Student Yield Analysis of Detached Single-Family Homes

To determine the number of children per housing unit (student yield) of all detached single-family homes in Bernards, the township's parcel-level database (excluding townhouses, condominiums, duplexes, and apartments) was joined to the school district's 2017-18 student database. A total of 5,611 single-family homes were identified. The simplest way to compute student yields is to divide the total number of students by the total number of homes. However, one drawback of this computation is that the student yield would include homes owned by all age segments of the population, such as empty-nesters and senior citizens, which would lower the overall student yield. Yields computed in this fashion are likely underestimating the future number of children in proposed developments or from home resales, where families with children are likely to be the buyers.

Instead, the length of ownership of the housing unit was considered, as student yields are typically highest from 0-10 years of ownership and are lowest at 20 or more years of ownership. It should be noted that the forthcoming student yield distribution is a snapshot in time. If the percentage of children in the population changes, or the demographics of the community change where ethnic groups of larger sizes enter, or if the school district's reputation changes and more or less children attend the district, student yields are likely to change as well.

To determine length of ownership, parcel-level records of all detached single-family homes in Bernards were downloaded from the Monmouth County Tax Board[1] database. Besides the property address, other variables include block and lot, sale dates and prices, and in most instances, the year that the home was built. Since student yields by length of ownership were analyzed, it was necessary to know the year of the most recent sale. Determining the most recent sale date was not always obvious. Some of the most recent sale dates had a sales price of $1 or $100. These "paper sales" were coded as a non-usable deed transaction. These transactions include sales between members of the immediate family, resulting in a change in title but often not a change of the occupant. In these instances, the data were excluded from the analysis and the next most recent sale date was used instead.

One of the limitations of the database was the lack of recorded sales prior to 1969. Since many of the homes have never been sold since 1969, the earliest sale date recorded, the length of ownership exceeded 47 years (using data through 2016) but the exact length of ownership was unknown. The community also had many homes constructed after 1969 that had never been sold. However, in these instances, the length of ownership could be computed by simply subtracting the year that the home was built from the current year.

[1] The Monmouth County database provides information for all municipalities in the state.

Student Yields by Length of Ownership in Detached Single-Family Homes

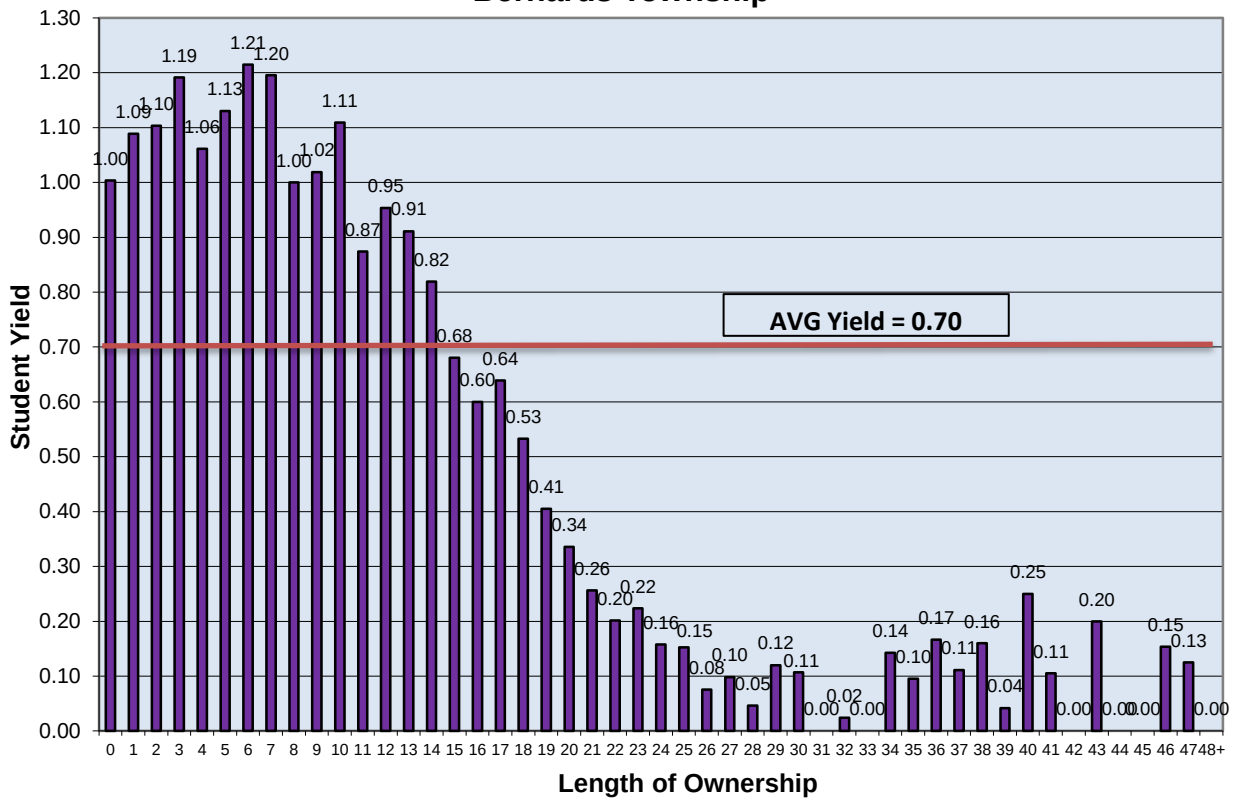
Student yields by length of ownership of detached single-family homes was determined by joining the parcel-level property database with 2017-18 student address data, which was provided by the school district. Table 13 following shows the student yields by length of ownership for the PK-12 student population (public school students only). It is expected that longer-held homes will have fewer children, as they would have graduated from the district.

Table 13
Student Yields by Current Length of Ownership in Bernards Township Detached Single-Family Homes

Years of Ownership	Housing Units	Students in 2017-18	Student Yield
0	275	276	1.00
1	237	258	1.09
2	252	278	1.10
3	251	299	1.19
4	212	225	1.06
5	177	200	1.13
6	191	232	1.21
7	169	202	1.20
8	141	141	1.00
9	162	165	1.02
10	211	234	1.11
11	183	160	0.87
12	193	184	0.95
13	191	174	0.91
14	177	145	0.82
15	147	100	0.68
16	210	126	0.60
17	205	131	0.64
18	197	105	0.53
19	195	79	0.41
20	149	50	0.34
21	117	30	0.26
22	134	27	0.20
23	85	19	0.22
24	95	15	0.16
25	72	11	0.15
26	66	5	0.08
27	51	5	0.10
28	65	3	0.05
29	50	6	0.12
30	56	6	0.11
31	38	0	0.00
32	41	1	0.02
33	27	0	0.00
34	14	2	0.14
35	21	2	0.10
36	12	2	0.17
37	18	2	0.11
38	25	4	0.16
39	24	1	0.04
40	16	4	0.25
41	19	2	0.11
42	7	0	0.00
43	10	2	0.20
44	12	0	0.00
45	5	0	0.00
46	13	2	0.15
47	8	1	0.13
48+	385	0	0.00

Figure 21 shows that, in general, student yields slowly increase with length of ownership, peaking at 1.21 children per housing unit with six (6) years of ownership. Student yields then decline as length of ownership increases. After 24 years of ownership, student yields are typically below 0.20 children per home.

Figure 21
Student Yields by Length of Ownership
Detached Single-Family Homes
Bernards Township



Since the length of ownership is a distribution, how can one determine what is the likely student yield in a home resale or newly constructed unit? Since the distribution is a snapshot in time, what is a reasonable student yield to use? Computing the average over the entire length of ownership period underestimates the number of children, since there are so few children at longer lengths of ownership as children graduate from the school district. Unfortunately, there is no research-based metric to determine what part of the distribution should be used to estimate future schoolchildren. Instead, we propose computing an average using all of the years up to the peak student yield, which estimates the maximum impact before student yields begin to decline.

As discussed above, the average student yield (0.70) computed from the entire housing stock likely underestimates the actual student yield when a family either moves into a new home or a resale. If an average student yield is computed for the first six years of ownership when the peak student yield occurs, the yield increases to 1.11. This is likely a better estimate of the student yield of detached single-family homes in Bernards.

Student Yield Analysis for Townhouses/Condominiums/Duplexes

Student yields were also computed for townhouses/condominiums/duplexes in Bernards by joining the township's parcel-level database with student addresses from the 2017-18 year. Lengths of ownership were not computed as there is a lot of variation of the student yields based on the development's bedroom distribution and whether it has child-friendly amenities, such as a playground or swimming pool. In Table 14, student yields are shown by name of development. A total of 4,052 units were identified in sixteen separate developments. Student yields were largest in Patriot Hill (0.80) and Hamilton Ridge (0.72). The overall student yield for townhouses/condominiums/duplexes in Bernards was 0.30. Table 14 reflects the combined student yields in market-rate and affordable housing units. A total of 195 units were identified as affordable and contained 16 children, which is a student yield of 0.08.

Table 14
Student Yields for Townhouses/Condominiums/Duplexes in Bernards Township

Development	Elem. Area	Unit Type	Year Built	Bedrooms	Units[1]	Students[2]	Student Yield
Amherst Mews	Mount Prospect	TH/Duplex	1997-1998	3-4 BR	123	45	**0.37**
(The) Barons	Cedar Hill	TH	1984-1986	2-3 BR	132	4	**0.03**
Cedars at Basking Ridge	Liberty Corner	TH/Duplex	1988-1995	1-3 BR	526	135	**0.26**
Countryside Manor	Oak Street	TH	1983	1-2 BR	150	15	**0.10**
Crown Court Drive	Cedar Hill	Duplex	1991	2-BR	16	10	**0.63**
Hamilton Crest in the Hills	Mount Prospect	TH	1998-1999	2-4 BR	158	95	**0.60**
Hamilton Ridge in the Hills	Mount Prospect	TH	1999-2000	2-3 BR	118	85	**0.72**
Hamilton Woods in the Hills	Mount Prospect	TH	1995-1997	2-3 BR	198	81	**0.41**
Lord Stirling Village	Cedar Hill	TH	1986	2-3 BR	150	27	**0.18**
Maple Run	Oak Street	TH	1987	2-3 BR	64	7	**0.11**
Patriot Hill	Mount Prospect	TH	1999-2002	3-4 BR	261	208	**0.80**
Patriot Mews	Mount Prospect	TH	1999-2000	3-4 BR	76	49	**0.64**
(The) Ridge	Cedar Hill	TH	1983	2-3 BR	104	23	**0.22**
St. Andrews	Mount Prospect	TH	2002-2003	3-4 BR	14	1	**0.07**
Society Hill at Bernards (I & II)	Liberty Corner	TH	1985-1989	2-3 BR	812	285	**0.35**
Spring Ridge	Cedar Hill	TH, SF, Duplex	1986-1994	1-2 BR	1150	155	**0.13**
Total					**4,052**	**1,225**	**0.30**

Note: [1]As derived from the Bernards Township property database
[2]Based on 2017-18 enrollment

In Table 15 following, the student yields from Table 14 were aggregated and summarized by elementary attendance area. The Cedar Hill attendance area had the greatest number of units, accounting for 38% of the township's townhouses/condominiums/duplexes. The Liberty Corner attendance area had the second-greatest number of units, accounting for 33% of the township's townhouses/condominiums/duplexes. The Oak Street attendance area had the fewest number of units. The student yield is highest in the Mount Prospect attendance area (0.59) and lowest in the Oak Street attendance area (0.10).

Table 15
Student Yields for Townhouses/Condominiums/Duplexes by Elementary Attendance Area

Attendance Area	Number of Units[1]	Number of Students[2]	Student Yield
Cedar Hill	1552	219	**0.14**
Liberty Corner	1338	420	**0.31**
Mount Prospect	948	564	**0.59**
Oak Street	214	22	**0.10**
Total	**4,052**	**1,225**	**0.30**

Note: [1]As derived from the Bernard Township property database
[2]Based on 2017-18 enrollment

Student Yield Analysis for Apartments

In addition, student yields were computed for apartment complexes in Bernards. In Table 16, student yields are shown by name of the development. The table is not an all-inclusive list of all apartment units, as it only includes large apartment complexes. The number of apartment complexes is limited in Bernards, as there is only one development, Crown Court, consisting of 80 units. Located in the Cedar Hill elementary attendance area, the student yield is 0.61 in Crown Court.

Table 16
Student Yields for Apartments in Bernards Township

Development	Elem. Area	Year Built	Bedrooms	Units[1]	Students[2]	Student Yield
Crown Court (Monarch Circle)	Cedar Hill	1989	1-2	80	49	**0.61**
Total				**80**	**49**	**0.61**

Note: [1]As derived from the Bernards Township property database
[2]Based on 2017-18 enrollment

Historical Residential Construction

With respect to historical new construction, the number of certificates of occupancy ("COs") issued for new homes in Bernards from 2012-2017 is shown in Table 17. A total of 81 COs were issued over this time period, of which 61 were for single-family or two-family homes and 20 were for multi-family homes. However, during the same time period, there were 28 demolitions as shown in Table 17, resulting in a net gain of 53 homes over the time period. Many of the COs are due to the building of a new home after the demolition of an older one. In these instances, there is no net gain in the number of housing units.

Table 17
Number of Residential Certificates of Occupancy by Year in Bernards Township 2012-2017

Year	Certificates of Occupancy				Demolitions	Net Total
	1&2 Family	Multi-Family	Mixed Use	Total	1 & 2 Family	
2012	17	0	0	**17**	**5**	**+12**
2013	16	20	0	**36**	**5**	**+31**
2014	9	0	0	**9**	**7**	**+2**
2015	8	0	0	**8**	**4**	**+4**
2016	11	0	0	**11**	**4**	**+7**
2017 (thru Sept)	0	0	0	**0**	**3**	**-3**
Total	**61**	**20**	**0**	**81**	**28**	**+53**

Source: New Jersey Department of Community Affairs

Estimate of Public School Children from New Housing

An estimate was made of the number of public school children that could potentially come from the proposed housing developments. It should be clearly stated that this is a rough estimate, as specific details of the proposed developments, such as bedroom distribution, were unavailable, which are needed to compute the estimated number of public school children. In addition, several assumptions were made:

1. All detached single-family homes (Mine Brook Farm and the Quarry) were assumed to have the following student yield multiplier: 1.11[2].

2. All market-rate apartment units (Crown Court, Dewy Meadow, and the Quarry) were assumed to have the student yield multiplier for apartments as computed from Crown Court: 0.61.

3. All affordable apartment units (Crown Court and Dewy Meadow) were assumed to have the student yield multiplier 0.62[3].

[2] As derived from the current length of ownership discussed previously.

4. All townhouse/flat units (Dewy Meadow and the Quarry) were assumed to have the township's average student yield multiplier for townhouses/condominiums/duplexes: 0.30.

Based on these student yields, the number of children in grades K-12 anticipated from each development is as follows:

- Dewy Meadow – 104
- Quarry – 114
- Crown Court – 15
- Mine Brook Farm –13

In total, 246 public school children are projected to be generated from the new housing developments, with nearly all residing in the Cedar Hill attendance area. It should be noted that this estimate may be conservative, particularly if the townhouse/flat student yields are similar to that of Patriot Hill or Hamilton Ridge. If that is the case, and the student yield is 0.75 instead of the estimated 0.30, there would be an additional 71 public school children, raising the overall total to 317.

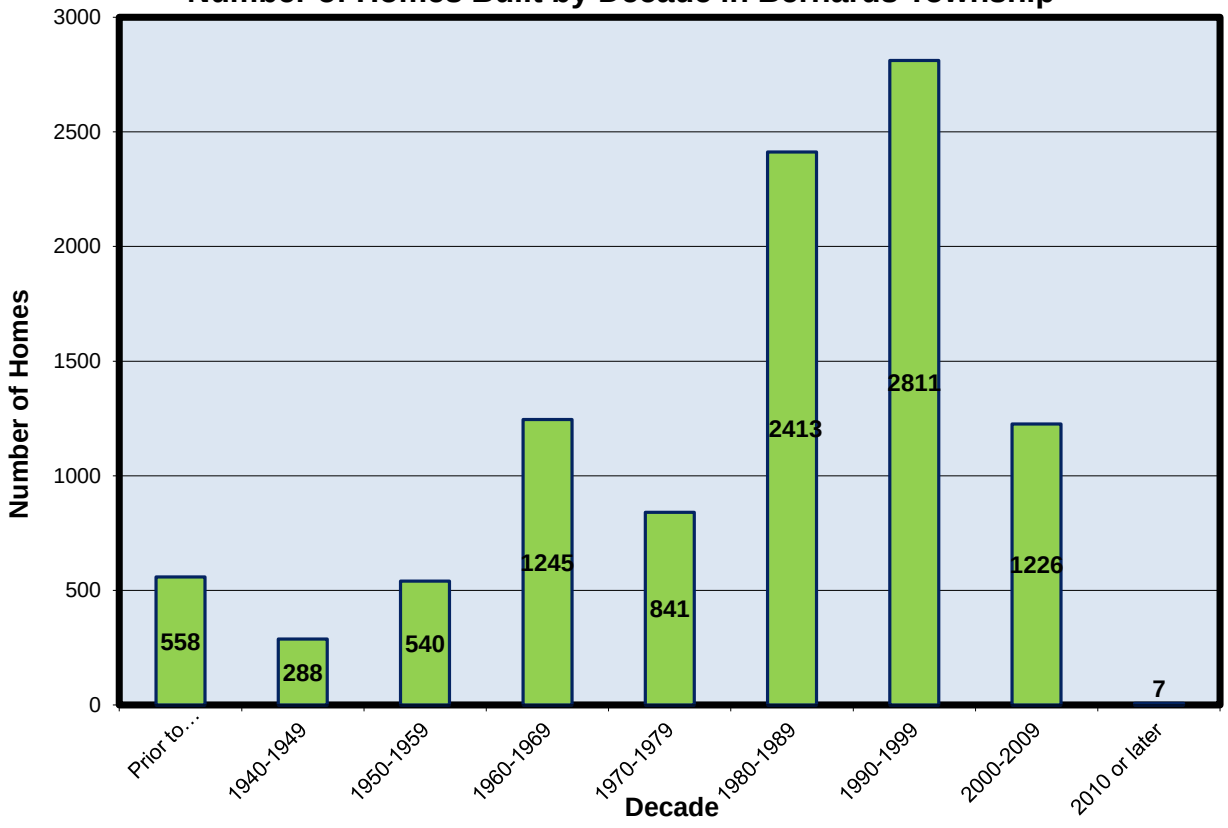
Due to the unavailability of the bedroom distributions for each development and the uncertainty of whether the proposed residential developments will get constructed, as well as the timeline of occupation, the baseline enrollment projections were not adjusted for the additional children anticipated from the new housing developments. It is recommended that the Board continue to monitor the status of all proposed developments to determine the future impact on the school district.

[3] As existing, comparable affordable housing units in the township are "for sale" units and not rentals, *Who Lives in New Jersey Housing,* published by the Rutgers University Center for Urban Policy Research, was used instead to obtain appropriate student yields. The value used reflects the yield for a two-bedroom affordable rental apartment unit in New Jersey.

Distribution of Homes by Decade Built

Figure 22 shows the number of homes built by decade in Bernards as provided by the 2011-2015 ACS. As shown in the figure, Bernards has a newer housing stock, with 65% of the homes being built after 1980. Of the decades shown, Bernards had the largest number of homes built in the 1990s, which corresponds to the sizable population gain in Bernards (+42.9%) shown previously in Table 1. It should be noted that the ACS number of homes built after 2010 has been underestimated, as 81 COs were issued for new residential housing units from 2012-2017.

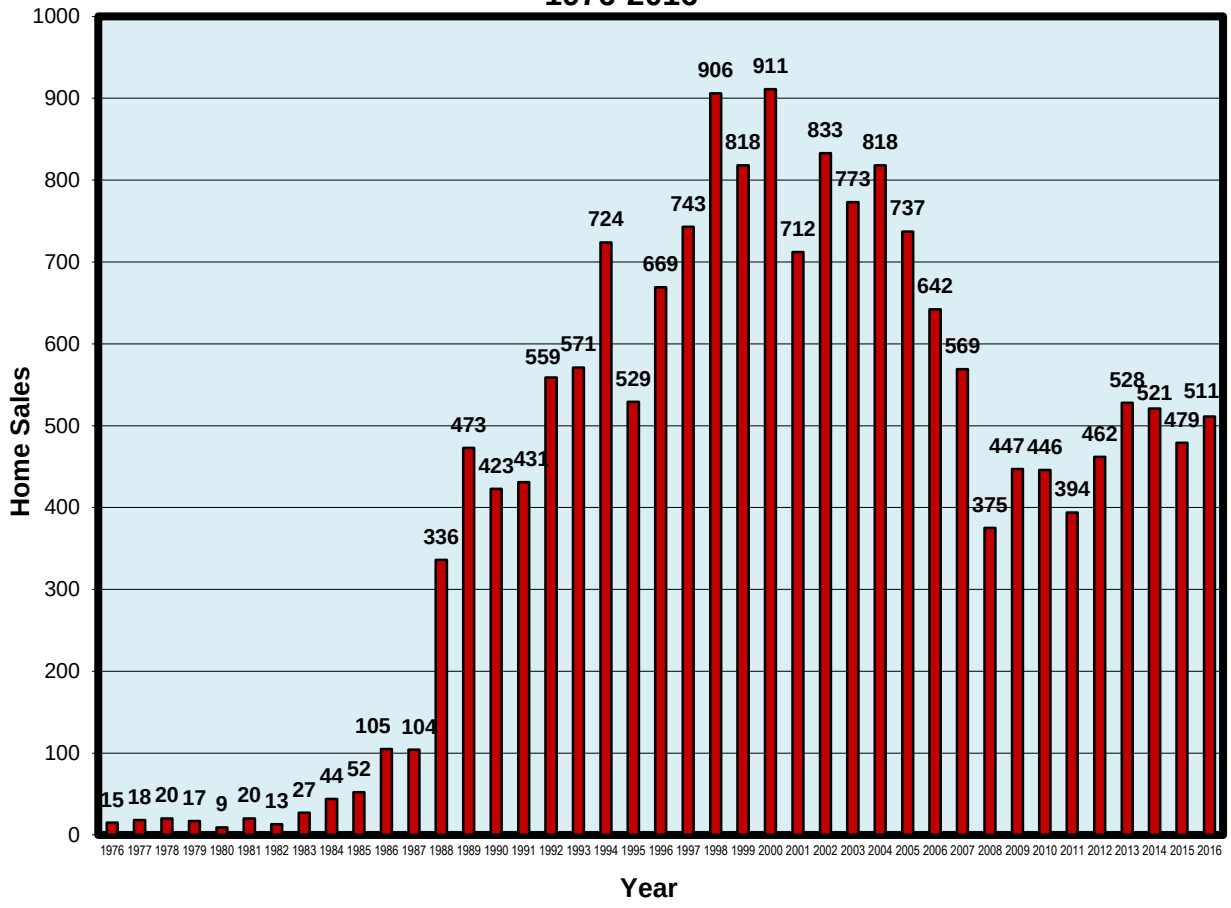
Figure 22
Number of Homes Built by Decade in Bernards Township



Home Sales

In Figure 23 below, the number of annual home sales in Bernards is shown from 1976-2016. The information was retrieved from the Monmouth County Tax Board database, which possesses tax records and home sales for all municipalities in the state. "Paper sales," which are sales between members of the immediate family for a low price (e.g., $1 or $100) and result in a change in title but often not a change of the occupant, were excluded from the totals below. From 1976-1983, the number of home sales ranged from 9-27 per year, which is a reflection of the smaller housing stock in Bernards at the time. After 1987, the number of sales sharply increased, peaking at 911 in 2000. Due to the housing market crash and banking crisis, the number of sales declined to 375 in 2008. Since then, home sales have rebounded and have slowly increased. However, the number of sales in 2016 (511) is still far below the peak total that occurred in 2000.

Figure 23
Bernards Township Home Sales
1976-2016



Enrollment Projections

Enrollment projections were calculated at the school level from the 2018-19 school year through the 2022-23 school year, a five-year period.

Enrollments for the self-contained special education/ungraded classes were computed by calculating the historical proportion of self-contained special education/ungraded students with respect to the regular education subtotals at each school and multiplying that value by the future regular education subtotals. The proportions will be shown in the forthcoming tables.

With respect to grade-level pre-kindergarten students at Mount Prospect, an average of the last four historical years was used to estimate the future pre-kindergarten enrollment. In the last four years, pre-kindergarten enrollment has ranged from 26-38 students per year. It was estimated that there would be 32 students in the program annually in the future.

On September 10, 2010, New Jersey Governor Chris Christie signed into law the Choice Program, which took effect in the 2011-12 school year. This enables students the choice in attending a school outside their district of residence if the selected school is participating in the choice program. The choice school sets the number of openings per grade level. The Bernards Township School District does not participate in the program and therefore has no impact on the enrollment projections.

As part of the School Funding Reform Act of 2008 ("SFRA"), all school districts in New Jersey are to provide expanded Abbott-quality pre-school programs for at-risk 3- and 4-year olds as outlined in N.J.A.C. 6A:13A. The State of New Jersey intends to provide aid for the full-day program based on projected enrollment. School districts categorized as District Factor Group[4] ("DFG") A, B, and CD with a concentration of at-risk pupils equal to or greater than 40 percent, must offer a pre-school program to all pre-school aged children regardless of income, known as "Universal" pre-school. For all other school districts, a pre-school program must be offered only to at-risk children, known as "Targeted" preschool. School districts may educate the pre-school children in district, by outside providers, or through Head Start programs. School districts were required to offer these programs to at least 90% of the eligible pre-school children by 2013-14.

Due to budgetary constraints, the NJDOE postponed the roll-out of the program, which was scheduled for the 2009-10 school year. According to a recent conversation with Ms. Karin Garver, Educational Program Development Specialist in the NJDOE Early Childhood Education, there are no plans in the imminent future by the State Legislature to fund the program, which would prevent school districts from implementing the program. The pre-school program would have been rolled out over a five-year period according to the following schedule:

- At least 20% of the eligible pre-school universe in Year 1
- At least 35% of the universe in Year 2
- At least 50% of the universe in Year 3

[4]Introduced by the New Jersey Department of Education in 1975, DFG provides a system of ranking school districts in the state by their socio-economic status. While the system is no longer used, the number of pre-kindergarten students was determined by the former DFG rankings.

- At least 65% of the universe in Year 4
- At least 90% of the universe in Year 5

The universe of pre-school children in "Universal" districts is computed by multiplying the 1st grade enrollment in 2007-08 by two. The universe of pre-school children in "Targeted" districts is computed by multiplying the 1st grade enrollment in 2007-08 by two and then multiplying by the percentage of students having free or reduced lunch in the district. The Bernards Township School District is a "Targeted" district since its DFG is "J" with a concentration of at-risk pupils less than 40 percent (0.76%). In Table 18 following, the estimated number of total eligible pre-school students is provided with the estimated five-year rollout. For the purpose of this study, it has been assumed that the district would educate its pre-school children in-house. As the table shows, there is the potential for only six (6) pre-kindergarten students as a result of the SFRA. Since it is unclear if and when the program will be funded and subsequently mandated, the forthcoming enrollment projections do not include additional pre-kindergarten students from the SFRA.

Table 18
Estimated Number of Eligible Pre-School Students as Per School Funding Reform Act of 2008

DFG (2000)	Total eligible	Year 1	Year 2	Year 3	Year 4	Year 5
J	**6**	1	2	3	4	5

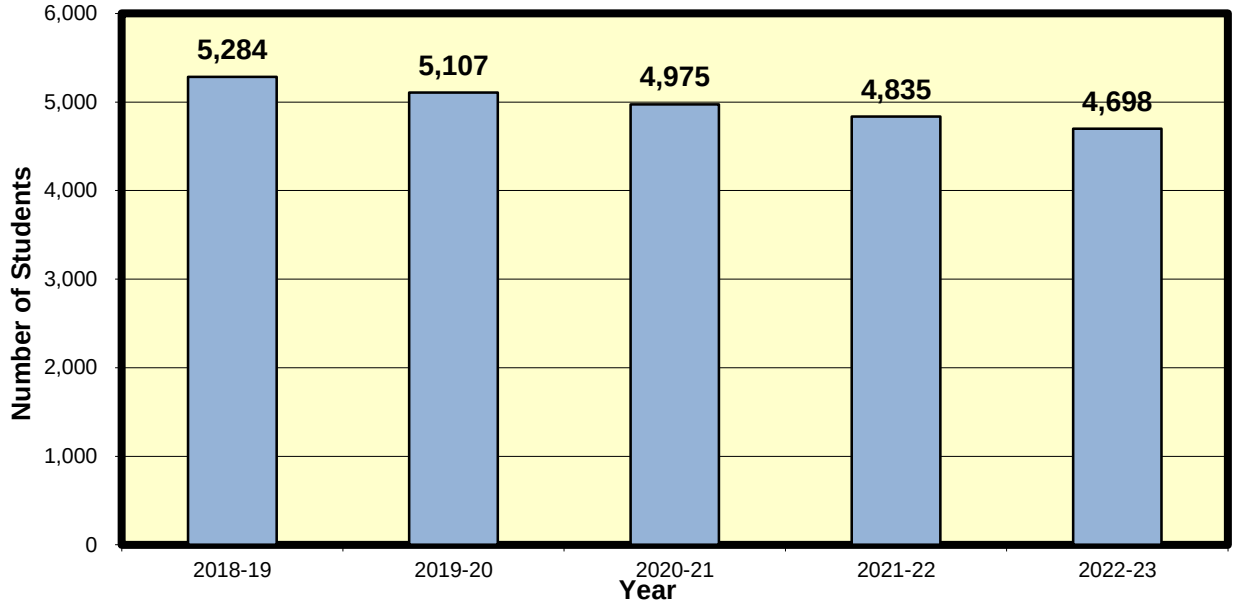
Source: New Jersey Department of Education, Division of Early Childhood Education

Projected PK-12 enrollments follow in Table 19 and Figure 24. Total enrollment is projected to decline throughout the projection period. In 2022-23, enrollment is projected to be 4,698, which would be a loss of 709 students from the 2017-18 enrollment of 5,407.

Table 19
Bernards Township School District Projected Enrollments 2018-19 to 2022-23

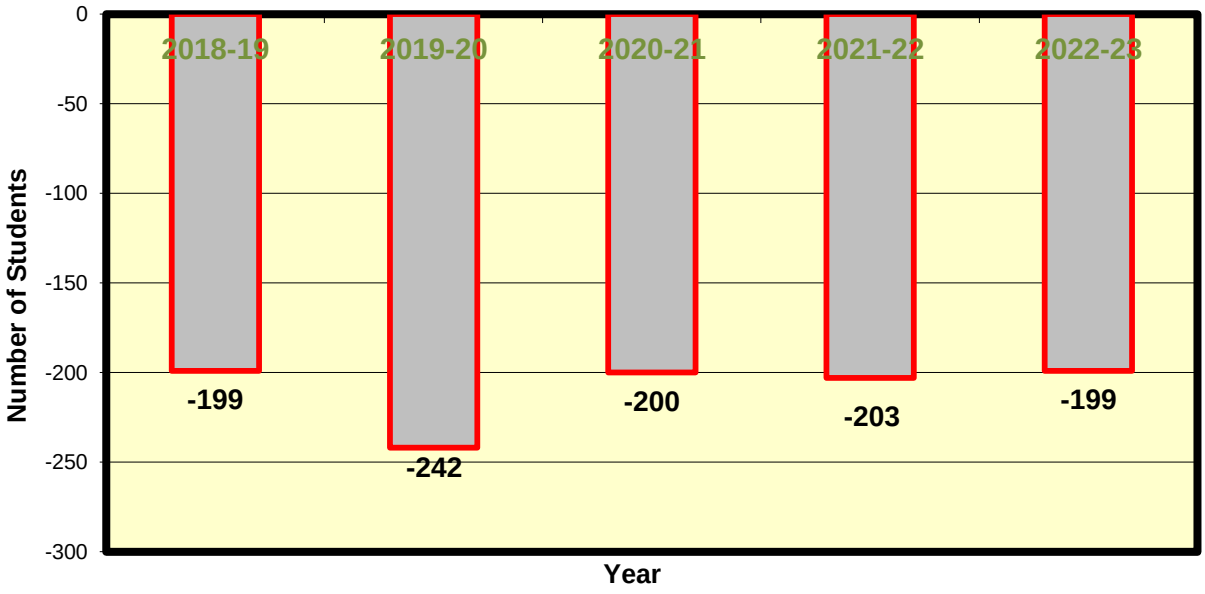
Year	PK RE	K	1	2	3	4	5	6	7	8	9	10	11	12	SE	PK-12 Total
2018-19	32	250	286	319	350	353	379	438	434	436	457	462	449	463	176	**5,284**
2019-20	32	221	267	297	330	364	357	389	446	436	439	453	462	447	167	**5,107**
2020-21	32	247	238	277	307	344	368	367	396	448	439	435	453	460	164	**4,975**
2021-22	32	257	266	246	286	320	347	378	374	398	452	435	435	451	158	**4,835**
2022-23	32	252	276	276	254	298	323	356	385	376	401	448	435	433	153	**4,698**

Figure 24
Bernards Township School District Projected Enrollments
2018-19 to 2022-23



Negative kindergarten replacement is expected to continue to occur in the future as shown in Figure 25. The magnitude of the negative kindergarten replacement is projected to be relatively stable throughout the projection period, ranging from 199-242 students per year, which is similar to the negative kindergarten replacement that occurred in 2017-18 (-216.5).

Figure 25
Bernards Township School District
Projected Kindergarten Replacement



Projections by School

Cedar Hill Elementary School

Historical enrollments for Cedar Hill from 2008-09 to 2017-18, and projected enrollments from 2018-19 to 2022-23, are shown below in Table 20. Enrollments have been fairly stable over the ten-year period, ranging from 586-615 students per year. In 2017-18, enrollment is 593, which is slightly lower than the 2008-09 enrollment of 606. Enrollments are projected to decline throughout the projection period. In 2022-23, enrollment is projected to be 476, which would be a loss of 117 students from the 2017-18 enrollment.

Table 20
Historical and Projected Enrollments of Cedar Hill Elementary School

Year	PK	K	1	2	3	4	5	SE[2]	PK-5 Total
Historical[1]									
2008-09	0	85	90	82	94	108	111	36	**606**
2009-10	0	90	94	89	90	97	111	44	**615**
2010-11	0	78	97	94	94	95	104	45	**607**
2011-12	0	77	83	97	103	96	102	37	**595**
2012-13	0	80	90	79	103	104	100	30	**586**
2013-14	0	83	94	94	91	111	108	31	**612**
2014-15	0	79	87	105	97	101	111	30	**610**
2015-16	0	82	75	88	113	101	101	42	**602**
2016-17	0	72	85	80	89	124	100	42	**592**
2017-18	0	76	79	87	87	94	126	44	**593**
CSR 5-Yr. Ratios		1.3466[3]	1.0328	1.0547	1.0517	1.0762	1.0016	0.0772[4]	
Projected									
2018-19	0	74	78	83	92	94	94	40	**555**
2019-20	0	50	76	82	87	99	94	38	**526**
2020-21	0	62	52	80	86	94	99	37	**510**
2021-22	0	67	64	55	84	93	94	35	**492**
2022-23	0	65	69	67	58	90	93	34	**476**

Notes: [1]Data as provided by the New Jersey Department of Education (http://www.nj.gov/education/data/enr/) and the Bernards Township School District
[2]Self-contained special education enrollment/Ungraded Students
[3]Birth-to-kindergarten ratio
[4]Average proportion of self-contained special education/Ungraded students with respect to PK-5 subtotals based on the last three years of historical data

Liberty Corner Elementary School

Historical enrollments for Liberty Corner from 2008-09 to 2017-18, and projected enrollments from 2018-19 to 2022-23, are shown below in Table 21. Enrollments had been fairly stable from 2008-09 through 2013-14 before slowly declining. In 2017-18, enrollment is 536, which is a loss of 71 students from the 2008-09 enrollment of 607. Enrollments are projected to decline throughout the projection period. In 2022-23, enrollment is projected to be 461, which would be a loss of 75 students from the 2017-18 enrollment.

Table 21
Historical and Projected Enrollments of Liberty Corner Elementary School

Year	PK	K	1	2	3	4	5	SE[2]	PK-5 Total
Historical[1]									
2008-09	0	87	96	97	95	99	116	17	**607**
2009-10	0	85	92	93	96	102	94	25	**587**
2010-11	0	77	83	94	89	97	100	22	**562**
2011-12	0	85	85	89	97	93	94	22	**565**
2012-13	20	74	90	93	96	97	93	28	**591**
2013-14	20	80	79	96	95	96	99	30	**595**
2014-15	0	85	81	85	84	99	91	31	**556**
2015-16	0	73	87	73	87	87	96	29	**532**
2016-17	0	86	83	87	77	93	98	21	**545**
2017-18	0	78	94	87	88	77	93	19	**536**
CSR 5-Yr. Ratios		1.2302[3]	1.0665	1.0063	1.0299[4]	1.0367	1.0110	0.0384[5]	
Projected									
2018-19	0	64	83	95	90	91	78	19	**520**
2019-20	0	71	68	84	98	93	92	19	**525**
2020-21	0	55	76	68	87	102	94	19	**501**
2021-22	0	70	59	76	70	90	103	18	**486**
2022-23	0	68	75	59	78	73	91	17	**461**

Notes: [1]Data as provided by the New Jersey Department of Education (http://www.nj.gov/education/data/enr/) and the Bernards Township School District
[2]Self-contained special education enrollment/Ungraded Students
[3]Birth-to-kindergarten ratio based on three historical years
[4]Ratio based on last four historical years of data
[5]Average proportion of self-contained special education/Ungraded students with respect to PK-5 subtotals based on the last two years of historical data

Mount Prospect Elementary School

Historical enrollments for Mount Prospect from 2008-09 to 2017-18, and projected enrollments from 2018-19 to 2022-23, are shown below in Table 22. Enrollments had been fairly stable from 2010-11 through 2014-15 before declining. In 2017-18, enrollment is 596, which is a loss of 160 students from the 2008-09 enrollment of 756. Enrollments are projected to decline throughout the projection period. In 2022-23, enrollment is projected to be 474, which would be a decline of 122 students from the 2017-18 enrollment.

Table 22
Historical and Projected Enrollments of Mount Prospect Elementary School

Year	PK	K	1	2	3	4	5	SE[2]	PK-5 Total
Historical[1]									
2008-09	14	91	104	108	117	153	124	45	**756**
2009-10	10	90	99	106	116	116	159	40	**736**
2010-11	0	93	99	107	106	115	117	41	**678**
2011-12	32	84	93	101	109	111	117	40	**687**
2012-13	19	79	96	101	113	106	114	57	**685**
2013-14	16	67	95	106	110	124	106	66	**690**
2014-15	31	78	80	99	112	112	121	54	**687**
2015-16	38	77	85	91	104	114	118	44	**671**
2016-17	32	61	79	87	90	102	117	63	**631**
2017-18	26	55	71	85	86	93	106	74	**596**
CSR 5-Yr. Ratios		1.9217[3]	1.1184	1.0698	1.0212	1.0125	1.0237	0.1263[4]	
Projected									
2018-19	32	50	62	76	87	87	95	62	**551**
2019-20	32	44	56	66	78	88	89	57	**510**
2020-21	32	63	49	60	67	79	90	56	**496**
2021-22	32	61	70	52	61	68	81	54	**479**
2022-23	32	61	68	75	53	62	70	53	**474**

Notes: [1]Data as provided by the New Jersey Department of Education (http://www.nj.gov/education/data/enr/) and the Bernards Township School District
[2]Self-contained special education enrollment/Ungraded Students
[3]Birth-to-kindergarten ratio based on last four historical years
[4]Average proportion of self-contained special education/Ungraded students with respect to PK-5 subtotals based on the last two years of historical data

Oak Street Elementary School

Historical enrollments for Oak Street from 2008-09 to 2017-18, and projected enrollments from 2018-19 to 2022-23, are shown below in Table 23. From 2008-09 to 2013-14, enrollment had been fairly stable, ranging from 604-632 students per year. Enrollment has declined in each of the last four years, losing 127 students over this time period. Enrollment is 489 in 2017-18. Enrollments are projected to decline for the first four years of the projection period before stabilizing. In 2022-23, enrollment is projected to be 404, which would be a loss of 85 students from the 2017-18 enrollment.

Table 23
Historical and Projected Enrollments of Oak Street Elementary School

Year	PK	K	1	2	3	4	5	SE[2]	PK-5 Total
Historical[1]									
2008-09	0	91	87	117	92	109	108	0	**604**
2009-10	0	109	95	89	121	94	113	0	**621**
2010-11	0	86	116	103	96	124	99	0	**624**
2011-12	0	96	86	121	108	98	123	0	**632**
2012-13	0	89	100	88	126	105	99	0	**607**
2013-14	0	84	96	100	96	129	111	0	**616**
2014-15	0	66	90	96	103	98	126	0	**579**
2015-16	0	79	75	96	97	105	98	0	**550**
2016-17	0	54	76	76	102	98	107	0	**513**
2017-18	0	58	63	78	78	111	101	0	**489**
CSR 5-Yr. Ratios		1.5585[3]	1.0841	1.0266	1.0323	1.0347	1.0066	0.0000[4]	
Projected									
2018-19	0	62	63	65	81	81	112	0	**464**
2019-20	0	56	67	65	67	84	82	0	**421**
2020-21	0	67	61	69	67	69	85	0	**418**
2021-22	0	59	73	63	71	69	69	0	**404**
2022-23	0	58	64	75	65	73	69	0	**404**

Notes: [1]Data as provided by the New Jersey Department of Education (http://www.nj.gov/education/data/enr/) and the Bernards Township School District
[2]Self-contained special education enrollment/Ungraded Students
[3]Birth-to-kindergarten ratio based on four historical years
[4]Average proportion of self-contained special education/Ungraded students with respect to PK-5 subtotals

William Annin Middle School

Historical enrollments for Annin from 2008-09 to 2017-18, and projected enrollments from 2018-19 to 2022-23, are shown below in Table 24. After peaking at 1,428 students in 2010-11, enrollments have been declining, in general. In 2017-18, enrollment is 1,339, which is a loss of 89 students from the 2010-11 peak enrollment. Enrollments are projected to decline throughout the projection period. In 2022-23, enrollment is projected to be 1,136, which would be a loss of 203 students from the 2017-18 enrollment.

Table 24
Historical and Projected Enrollments of William Annin Middle School

Year	6	7	8	SE[2]	Total
Historical[1]					
2008-09	445	448	421	33	**1,347**
2009-10	478	455	449	16	**1,398**
2010-11	479	476	458	15	**1,428**
2011-12	433	484	476	15	**1,408**
2012-13	456	447	488	18	**1,409**
2013-14	433	462	453	16	**1,364**
2014-15	453	443	466	20	**1,382**
2015-16	454	463	454	25	**1,396**
2016-17	421	452	456	30	**1,359**
2017-18	426	434	453	26	**1,339**
CSR 5-Yr. Ratios	1.0271[3]	1.0179	1.0051	0.0174[4]	
Projected					
2018-19	438	434	436	23	**1,331**
2019-20	389	446	436	22	**1,293**
2020-21	367	396	448	21	**1,232**
2021-22	378	374	398	20	**1,170**
2022-23	356	385	376	19	**1,136**

Notes: [1]Data as provided by the New Jersey Department of Education (http://www.nj.gov/education/data/enr/) and the Bernards Township School District
[2]Self-contained special education enrollment/Ungraded Students
[3]Grade 5-6 ratio based on aggregated 5th grade enrollments of elementary schools
[4]Average proportion of self-contained special education/Ungraded students with respect to 6-8 subtotals

Ridge High School

Historical enrollments for Ridge from 2008-09 to 2017-18, and projected enrollments from 2018-19 to 2022-23, are shown below in Table 25. Enrollments in the school increased through 2014-15 before stabilizing. However, enrollment declined in 2017-18 to 1,854 for the first time in the ten-year period. Enrollments are projected to decline throughout the projection period. In 2022-23, enrollment is projected to be 1,747, which would be a loss of 107 students from the 2017-18 enrollment.

Table 25
Historical and Projected Enrollments of Ridge High School

Year	9	10	11	12	SE[2]	9-12 Total
Historical[1]						
2008-09	440	403	427.5	397	25	**1,692.5**
2009-10	427	443	402	424.5	19	**1,715.5**
2010-11	440	425.5	437	396.5	24	**1,723**
2011-12	452.5	442.5	421	435.5	26	**1,777.5**
2012-13	458.5	455.5	438	422	27	**1,801**
2013-14	489.5	457	457.5	440.5	30	**1,874.5**
2014-15	451.5	490	462.5	450	35	**1,889**
2015-16	469.5	443.5	484.5	458.5	32	**1,888**
2016-17	456.5	467.5	445	483.5	37	**1,889.5**
2017-18	466	449	465	449	25	**1,854**
CSR 5-Yr. Ratios	1.0079[3]	0.9907	0.9997	0.9955	0.0172[4]	
Projected						
2018-19	457	462	449	463	32	**1,863**
2019-20	439	453	462	447	31	**1,832**
2020-21	439	435	453	460	31	**1,818**
2021-22	452	435	435	451	31	**1,804**
2022-23	401	448	435	433	30	**1,747**

Notes: [1]Data as provided by the New Jersey Department of Education http://www.nj.gov/education/data/enr/) and the Bernards Township School District
[2]Self-contained special education enrollment/Ungraded Students
[3]Grade 8-9 ratio
[4]Average proportion of self-contained special education/Ungraded students with respect to 9-12 subtotals

Projected Enrollments by Grade Configuration

In Table 26 following, projected enrollments are shown by grade configuration (PK-5, 6-8, and 9-12). Ungraded special education students were reassigned into each of the grade configurations.

At the elementary level containing grades PK-5, enrollment is projected to steadily decline throughout the projection period. In 2022-23, enrollment is projected to be 1,815, which would represent a loss of 399 students from the 2017-18 enrollment of 2,214.

For Annin (grades 6-8) and Ridge (grades 9-12), the projected enrollments were discussed previously.

Table 26
Projected Enrollments for Grades PK-5, 6-8, and 9-12

Historical	PK-5	6-8	9-12
2017-18	2,214	1,339	1,854
Projected	**PK-5**	**6-8**	**9-12**
2018-19	2,090	1,331	1,863
2019-20	1,982	1,293	1,832
2020-21	1,925	1,232	1,818
2021-22	1,861	1,170	1,804
2022-23	1,815	1,136	1,747
5-year Change	**-399**	**-203**	**-107**

Capacity Analysis

Table 27 shows the educational capacities of the school buildings in the Bernards Township School District in comparison to both the current 2017-18 enrollments and the enrollment projections in the 2022-23 school year. Using the existing building capacities from the district's LRFP, the differences between capacity and actual number of students were computed. Positive values indicate available extra seating while negative values indicate inadequate seating (also known as "unhoused students"). All of the schools in the district currently have a surplus of seating, with the largest occurring at Mount Prospect (+243) and Oak Street (+177). In 2022-23, all of the schools are projected to have an increase in surplus seating due to declining enrollment, with the largest surplus occurring at Mount Prospect (+365) and Ridge (+335).

Table 27
Capacity Analysis

School	Capacity[1,2]	Actual Enrollment 2017-18	Difference	Projected Enrollment 2022-23	Difference
Cedar Hill Elementary School (K-5)	693	593	**+100**	476	**+217**
Liberty Corner Elementary School (K-5)	625	536	**+89**	461	**+164**
Mount Prospect Elementary School (PK-5)	839	596	**+243**	474	**+365**
Oak Street Elementary School (K-5)	666	489	**+177**	404	**+262**
William Annin Middle School (6-8)	1,471	1,339	**+132**	1,136	**+335**
Ridge High School (9-12)	1,976	1,854	**+122**	1,747	**+229**

Notes: [1]District Practices Capacity from the Bernards Township School District Long Range Facility Plan (2005)
[2]As the capacities were last calculated in 2005, the actual capacities of the buildings in 2017 may have changed if the buildings' instructional spaces are being used differently than in 2005.

Geocoding and Mapping

Student addresses from the school district were geocoded or "pin-mapped" for 2012-13 and 2017-18 for comparison purposes. A very small number of student addresses were unable to be located as the addresses were incomplete or no physical address was provided (P.O. boxes were listed instead of a physical address).

Figures 26 and 27 show the residential locations of all students (PK-12) in 2012-13 and 2017-18 respectively. In order to show relative concentrations of where students live, student counts were aggregated by census block, which are small geographical areas derived from census tracts as created by the United States Census Bureau. Figures 28 and 29 show the number of students per census block in 2012-13 and 2017-18 respectively. The number of students per census block has not changed appreciably in the last five years. Since all census blocks are not the same size, the greatest number of students are typically located in the largest census blocks. The greatest number of children per census block (colored dark blue) in 2017-18 was located in the southwest section of the township in the Mount Prospect attendance area, corresponding to where The Hills is located. Other areas shaded dark blue were in the Cedar Hill and Liberty Corner attendance areas.

Figures 30 and 31 show the density of students in square miles by census block. In an effort to control for the different census block sizes, the number of students in each census block was divided by the block's geographical area to determine the density of students (students per square mile). This was completed for both 2012-13 and 2017-18. The greatest student densities, which are shaded red and orange, are in the southwest section of the township in the Mount Prospect attendance area, corresponding to where The Hills is located.

To see which sections of Bernards have the most children per housing unit (student yield), the number of children per census block group was divided by the number of housing units in each census block as shown in Figures 32 and 33. In both 2012-13 and 2017-18, the greatest student yields, which were shaded red, were scattered throughout the township.

Figure 26
Bernards Township School District – PK-12 Students
2012-13

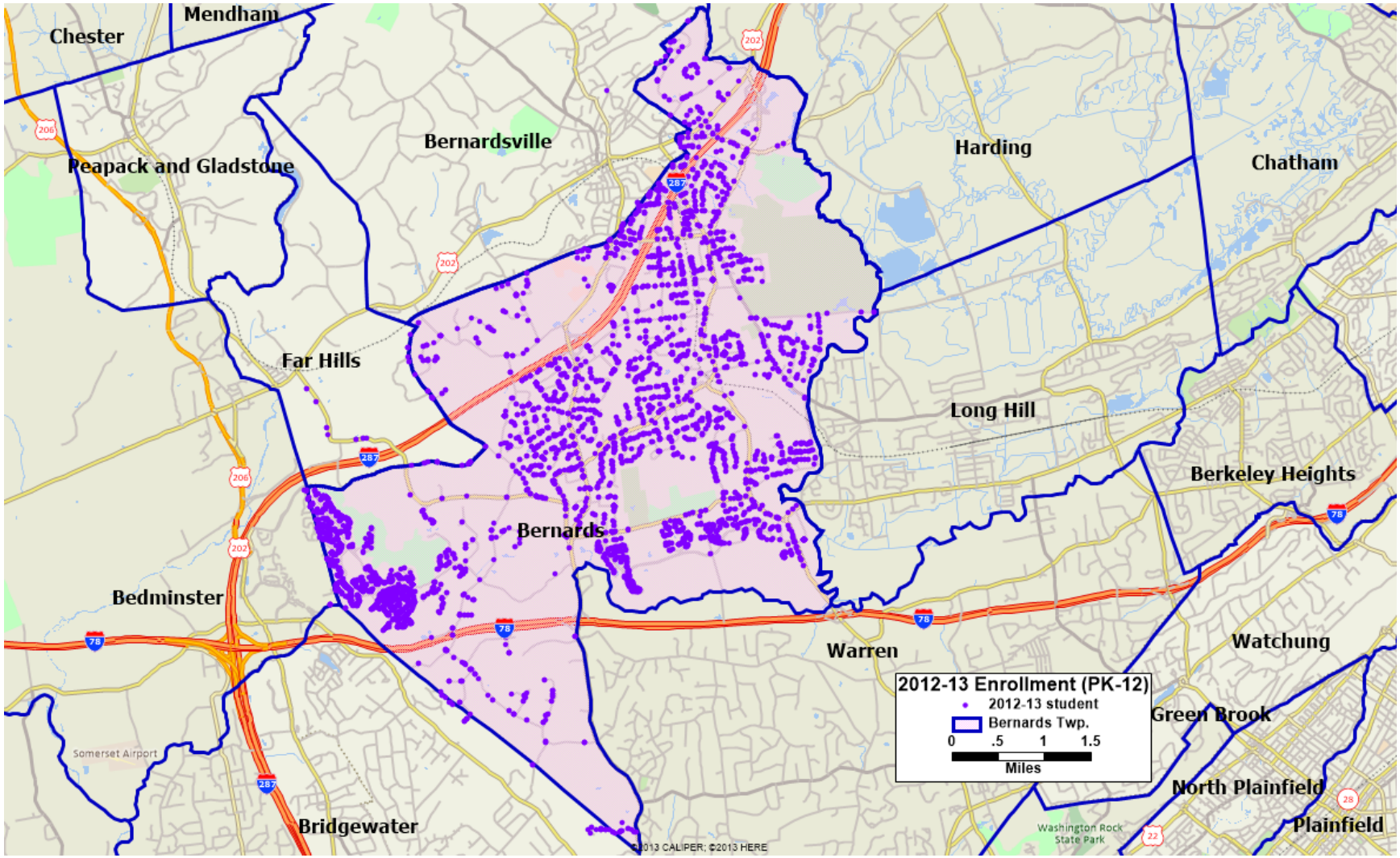


Figure 27
Bernards Township School District – PK-12 Students
2017-18

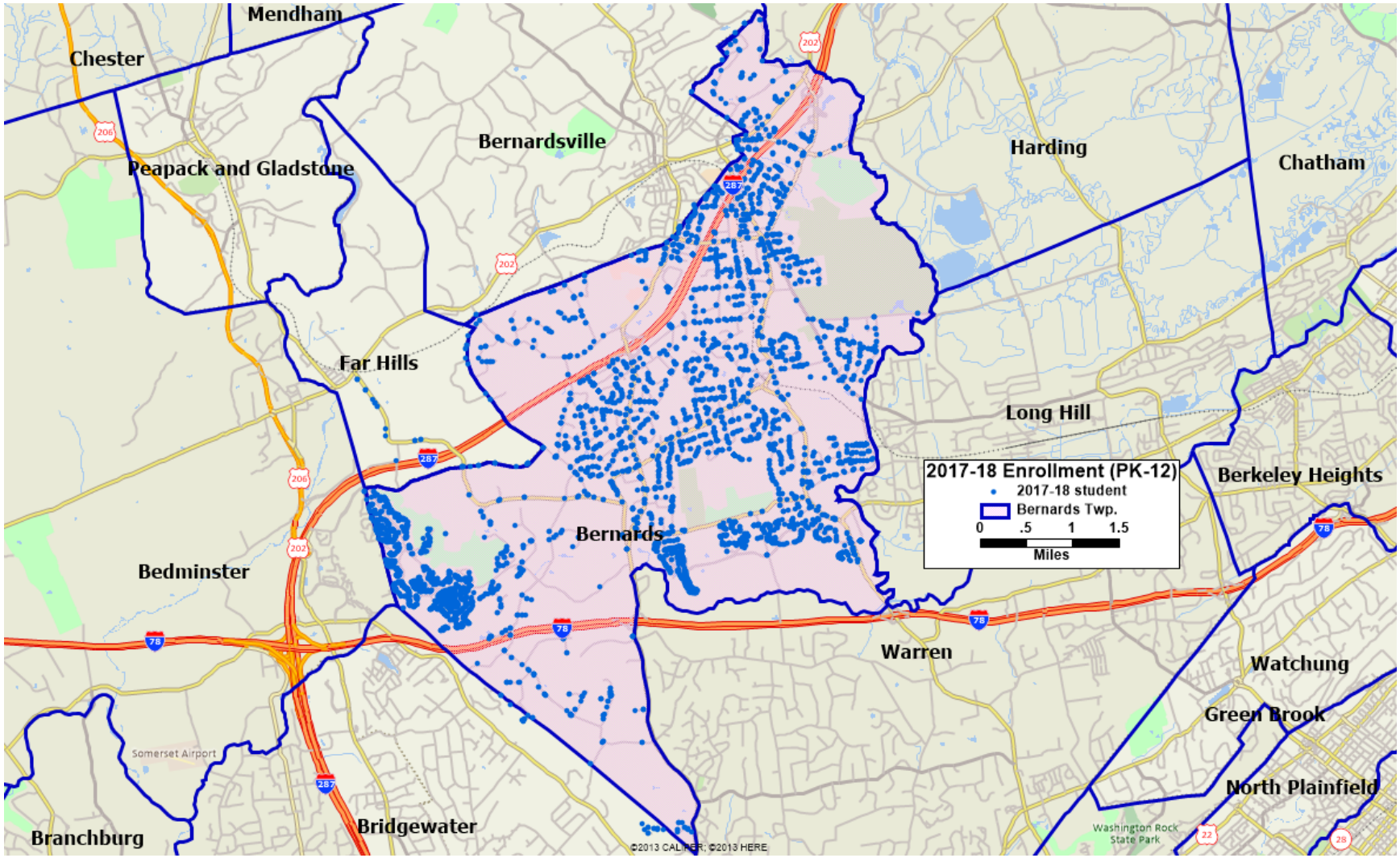


Figure 28
Bernards Township School District PK-12 Students by Census Block
2012-13

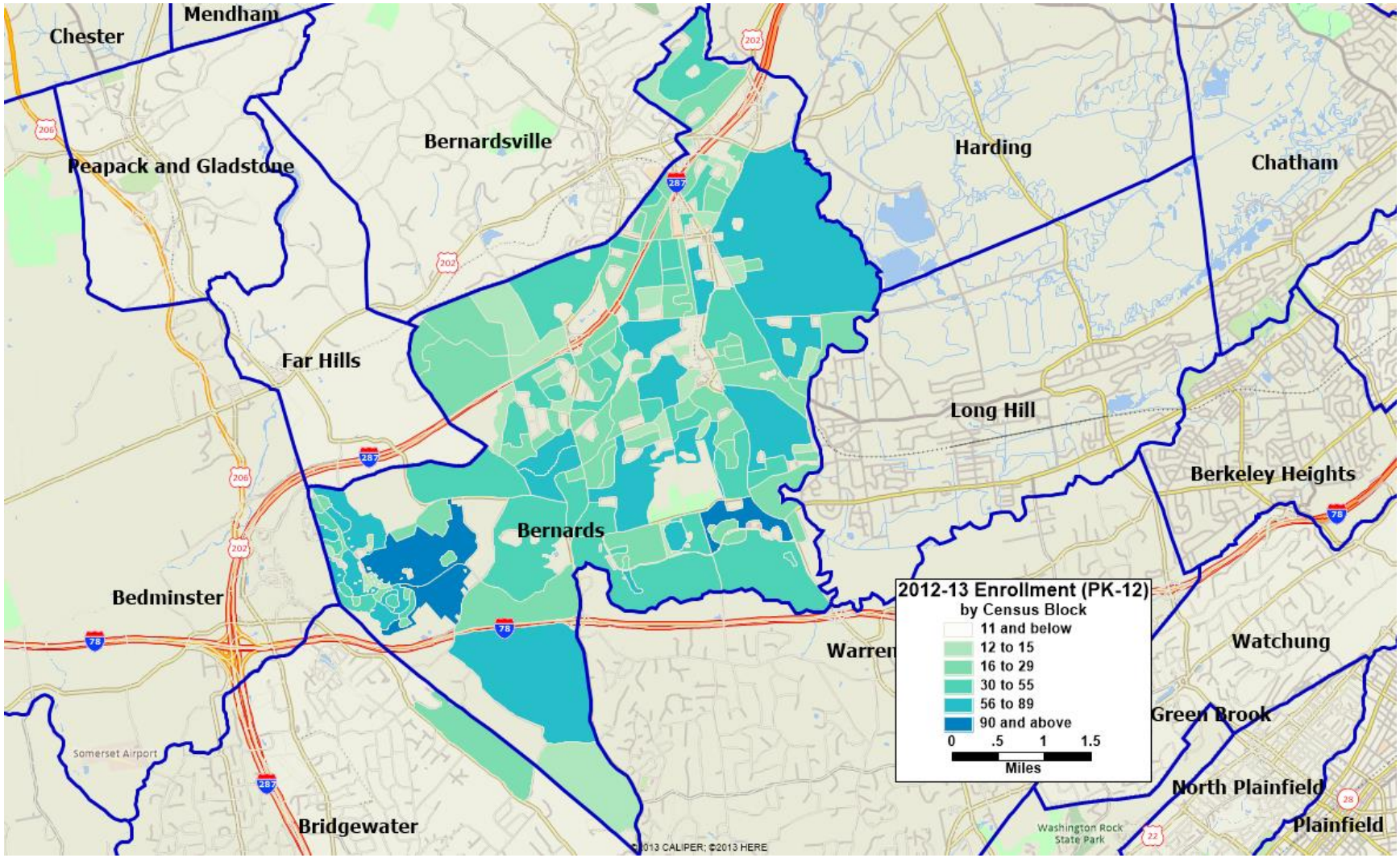


Figure 29
Bernards Township School District PK-12 Students by Census Block
2017-18

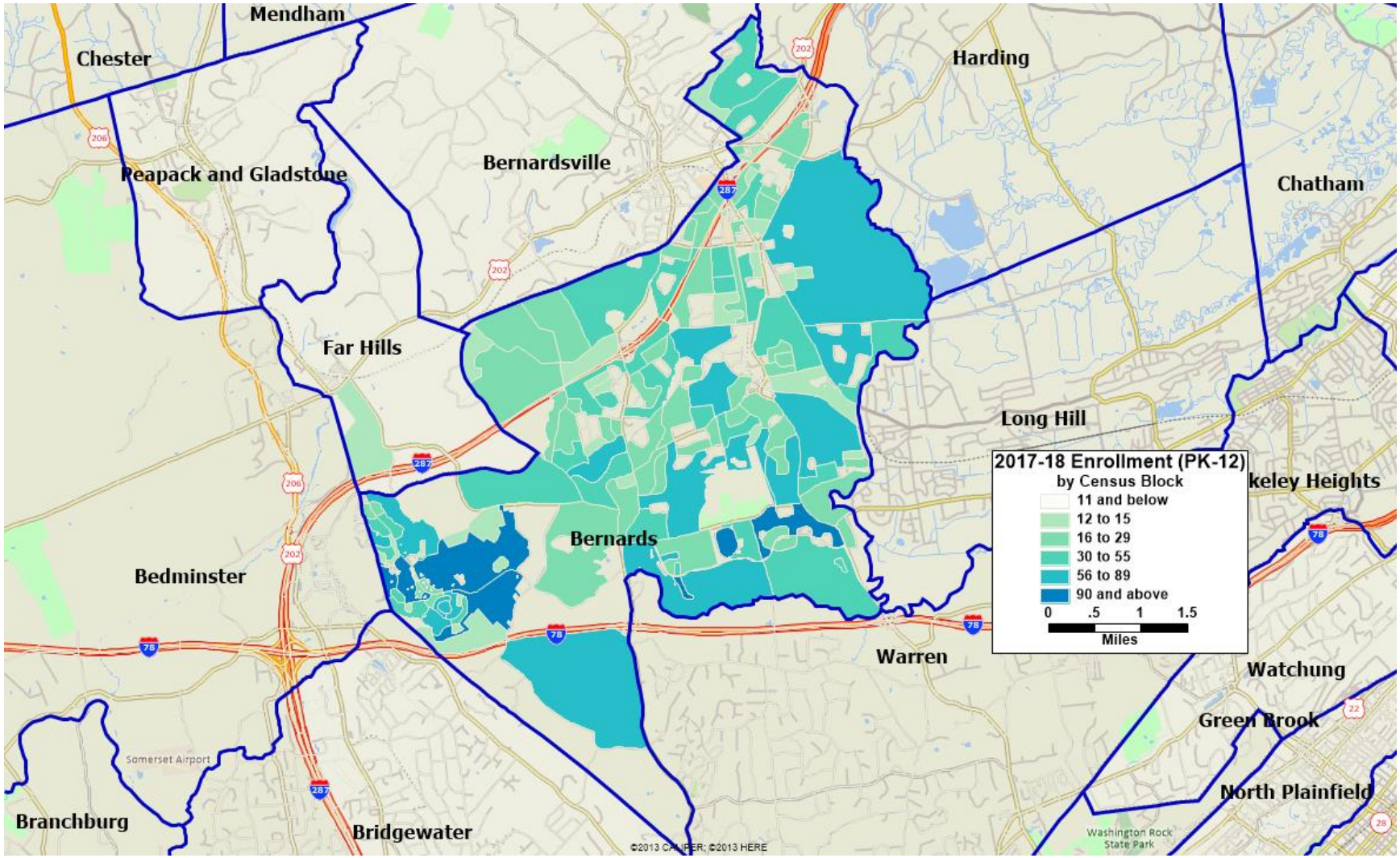


Figure 30
Bernards Township School District Student Density by Census Block
2012-13

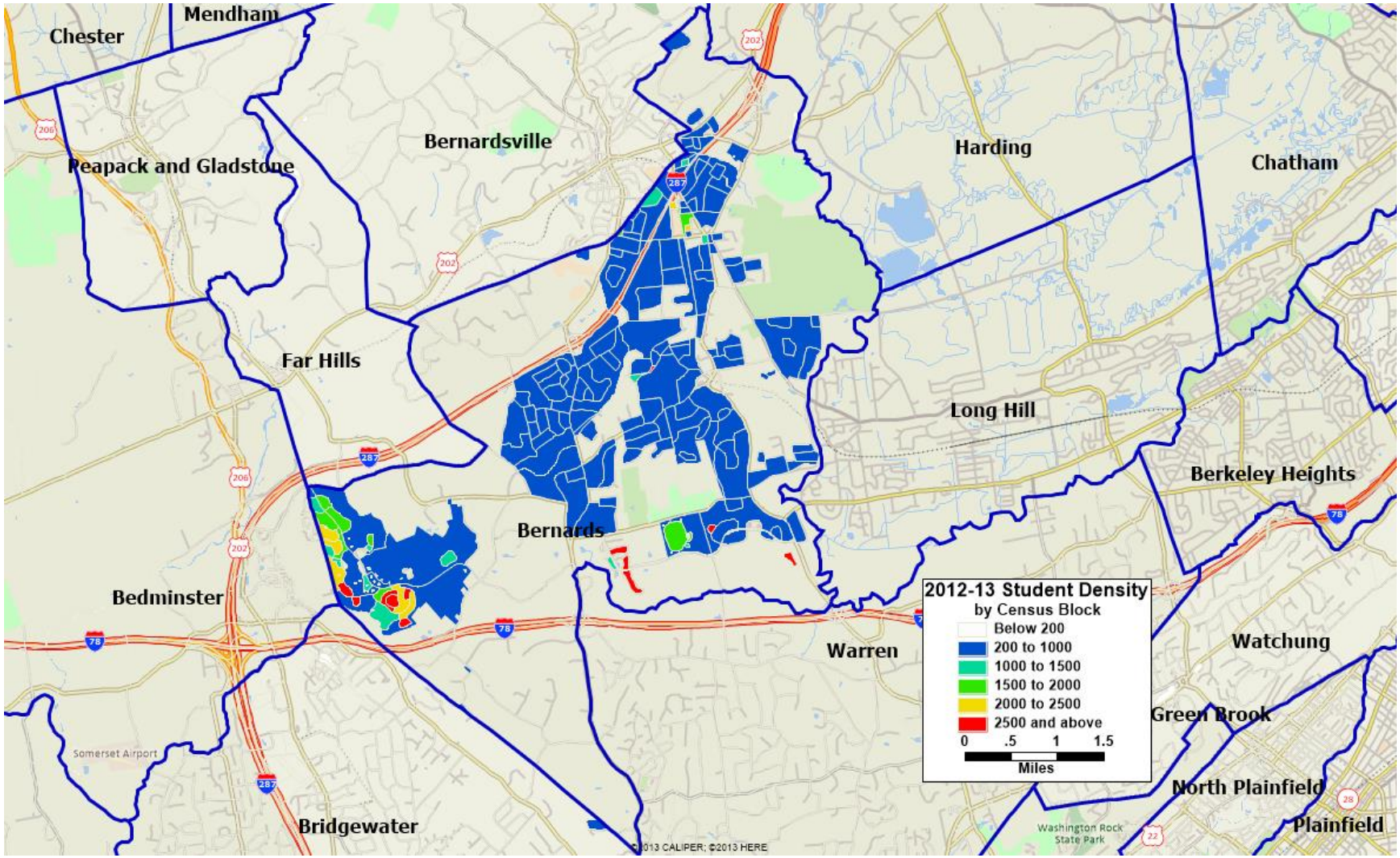


Figure 31
Bernards Township School District Student Density by Census Block
2017-18

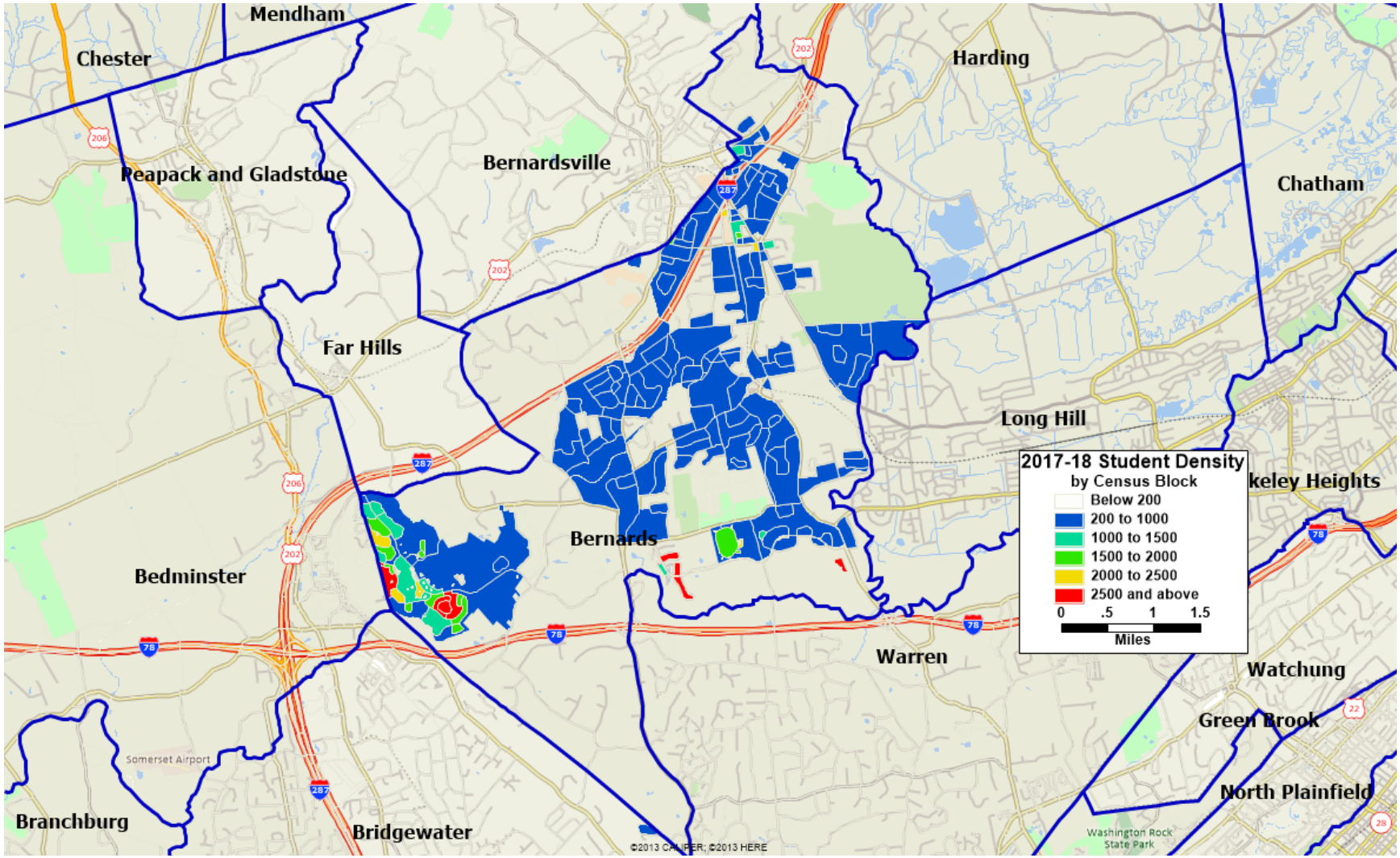


Figure 32
Bernards Township School District Student Yield by Census Block
2012-13

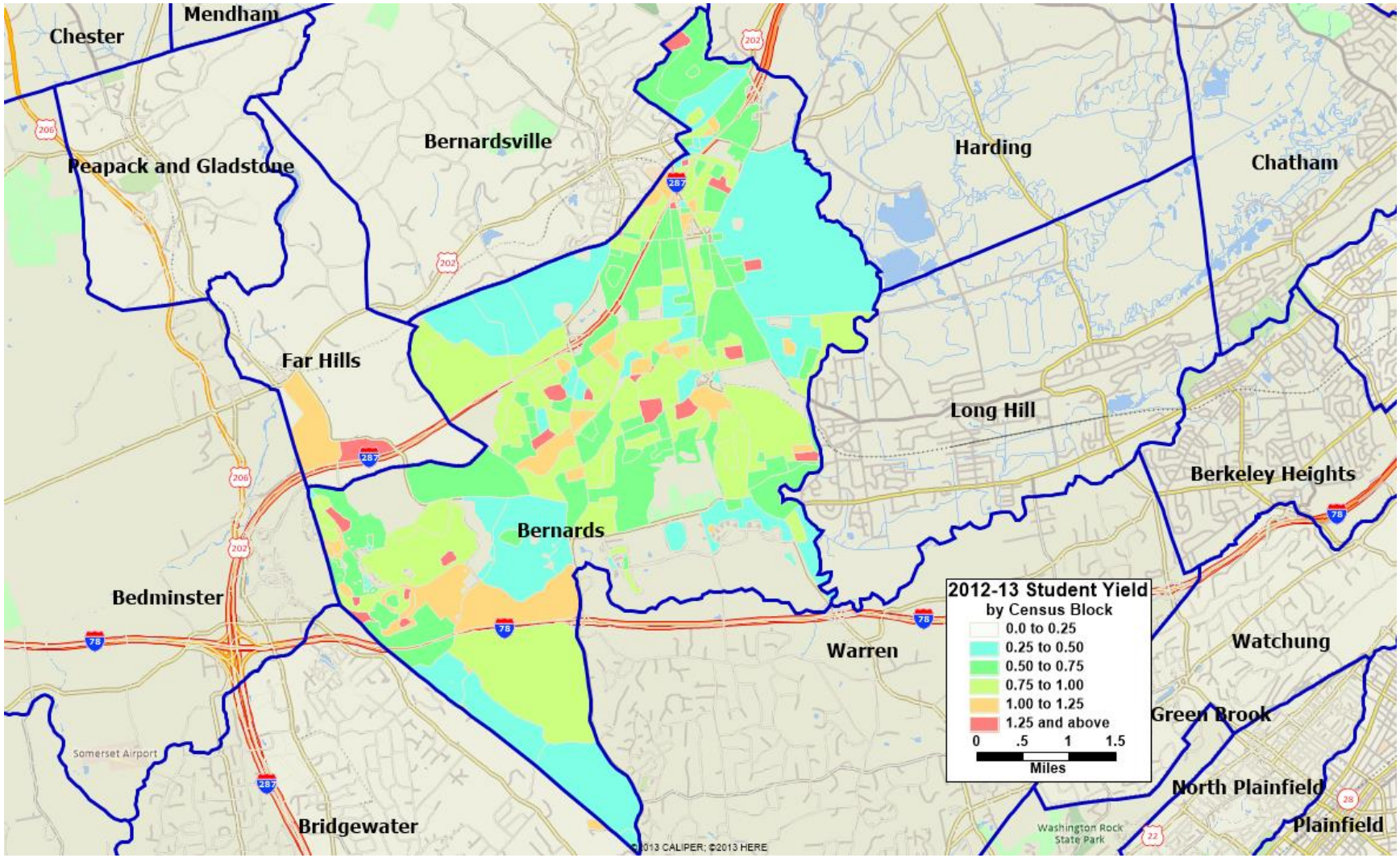
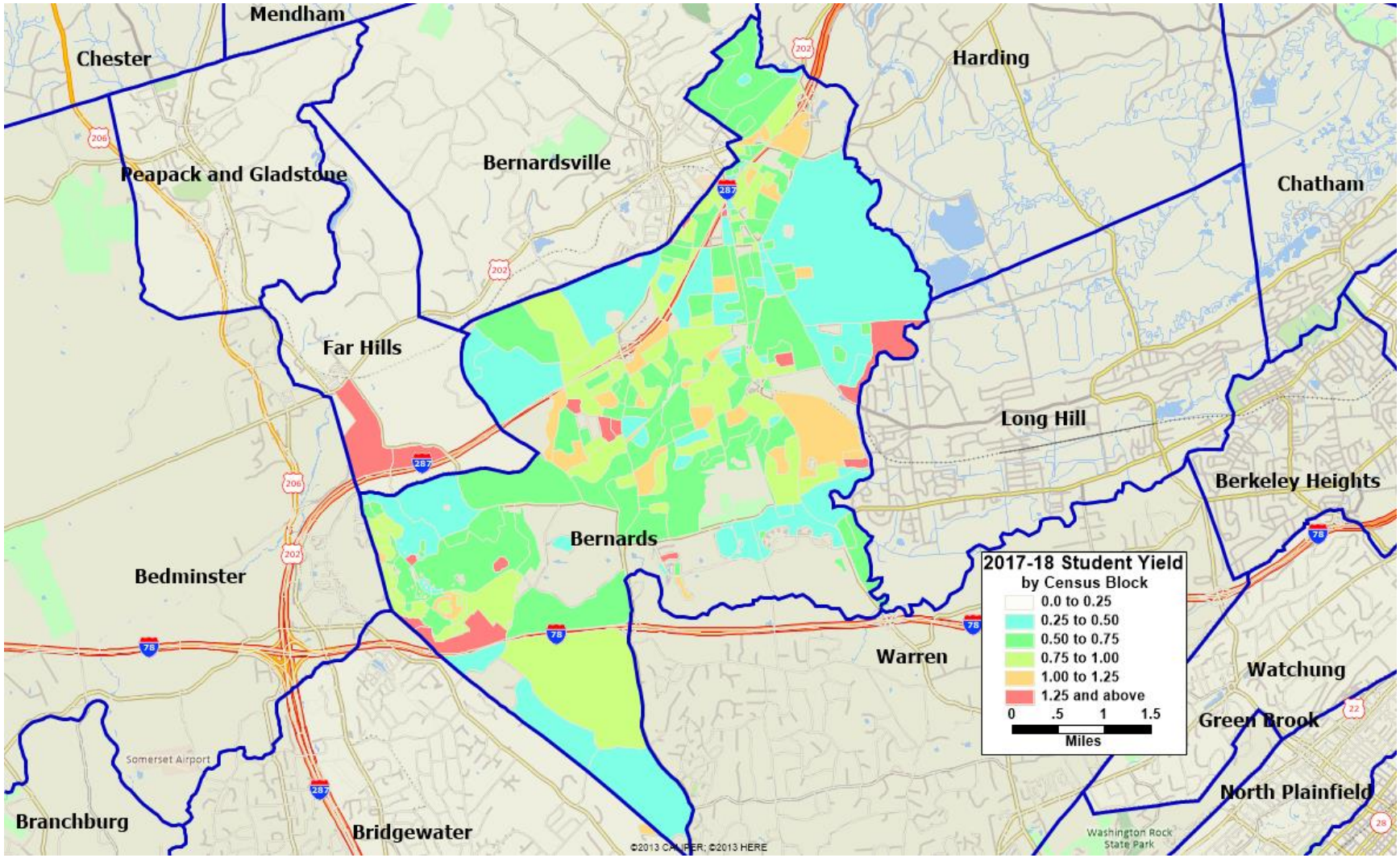


Figure 33
Bernards Township School District Student Yield by Census Block
2017-18



Housing Turnover Analysis

In a completely independent analysis, historical housing turnover rates by length of ownership in Bernards were used along with current student yields by length of ownership to project the number of students from 2017-2021, a five-year period[5]. To accomplish this task, 9,544 Bernards housing units designated as Class 2 properties (1- to 4-family homes) were analyzed. Mixed-use properties (commercial and residential combined) were excluded, as well as farms. Apartments were also excluded since the length of time a tenant occupies a residence cannot be determined. To complete this analysis, three inputs were needed:

1. housing turnover rates by length of ownership
2. current distribution of homes by length of ownership
3. student yields by length of ownership

Turnover Rates

To compute turnover rates, parcel-level data were obtained from the Monmouth County Tax Board database, which possesses tax records for all counties and municipalities in the state. The parcel-level data includes the year the home was built, the most recent sale dates, and the sale prices. The earliest sale date recorded in the database was 1969, providing 47 years of historical sales data through 2016.

Each cohort of homes was followed to see when it was sold next to compute the housing turnover rate by length of ownership. As an example, we will assume a house was built in 1965 and its three most recent sale dates in the database were 1992, 1995, and 1999. We cannot assume that the first length of ownership is 27 years since the house may have been sold prior to 1969, the earliest year sales were recorded. The first length of ownership is three years (1992 to 1995) whereby the home then becomes part of the 1995 cohort. After being sold four years later in 1999, the house becomes part of the 1999 cohort. Each time a home is sold, it becomes part of a different cohort of homes. In this example, the house was in three separate cohorts. Turnover rates were then computed by dividing the number of homes sold at a particular length of ownership by the total number of homes in the cohort. For instance, in the 2000 cohort, 55 homes sold in the first year of ownership out of 1,089 homes, resulting in a turnover rate of 5.1%. An additional 92 homes were sold in the second year of ownership, resulting in a turnover rate of 8.4%. Turnover rates by length of ownership were computed and capped at 16 years for the 2000 cohort, since 2016 is the most recent year that sales data were available. Since the oldest sales were from 1969, computing turnover rates was possible on long-held homes, with lengths of ownership up to 47 years.

In short, for each year from 1969-2016, there is a distribution of turnover rates by length of ownership. Length of ownership data was not collected for homes built or sold in 2017 as the data were incomplete. Obviously, there is not much information for homes with recent sale dates, such as 2013, since these homes may not have been sold again or would only have

[5]The rationale behind this method was taken from *An Alternate K-12 Enrollment Forecast Method for Older Neighborhoods* by Shelley Lapkoff Ph.D. of Lapkoff and Gobalet Demographic Research, Inc.

turnover rates by length of ownership of up to three years. At the other end of the spectrum, there were not many home sales in the 1970s and early 1980s since homeowners tended to stay in their homes longer and not "move up" to a bigger home. This was confirmed by the Bernards historical home sales in Figure 23, where the average number of home sales from 1976-1983 was 17 per year.

Turnover rates by length of ownership also vary according to the housing market. For instance, when the housing market was very strong in the early to mid-2000s, the turnover rate for the first year of ownership in Bernards was approximately 5-6%, as sellers tried to maximize their housing profits or move up into a bigger home. However, in the period following the housing market crash of 2008, the turnover rate in the first year of ownership was approximately 2-3%, which is a significantly lower rate, as homeowners had difficulty selling their homes.

Figure 34 shows the distribution of turnover rates by length of ownership in Bernards from 1985-2000 using a 3-year moving average to smooth out unusual year-to-year variations in the turnover rates. Although data were collected from 1969-2016, turnover rates for homes sold before 1985 are not shown as sales data were limited. In addition, turnover rates after 2000 are not shown, as they would only have maximum lengths of ownership of 16 years or less. While there is still a lot of variation even after using the three-year moving average, the figure shows that turnover rates decrease as lengths of ownership increase.

In Figure 35 following, weighted-average turnover rates by length of ownership are shown, which combines length of ownership data from all of the historical years. This data takes into account all housing market cycles, both when the housing market was very strong, such as the early to mid-2000s, and when it was weak, such as the period after the banking and financial crises of 2008. As the figure shows, turnover rates are greatest in Bernards at three years of ownership before declining. Turnover rates are lowest for longer lengths of ownership. For homes with 21 or more years of ownership, turnover rates were typically less than 1.0%. While there appears to be several spikes in the turnover rate after 40 years of ownership, this is misleading since there were very few homes at these lengths of ownership and a few sales had a large impact on the turnover rate.

Figure 34
Turnover Rates by Length of Ownership
3-Year Moving Average in Bernards Township
1985-2000

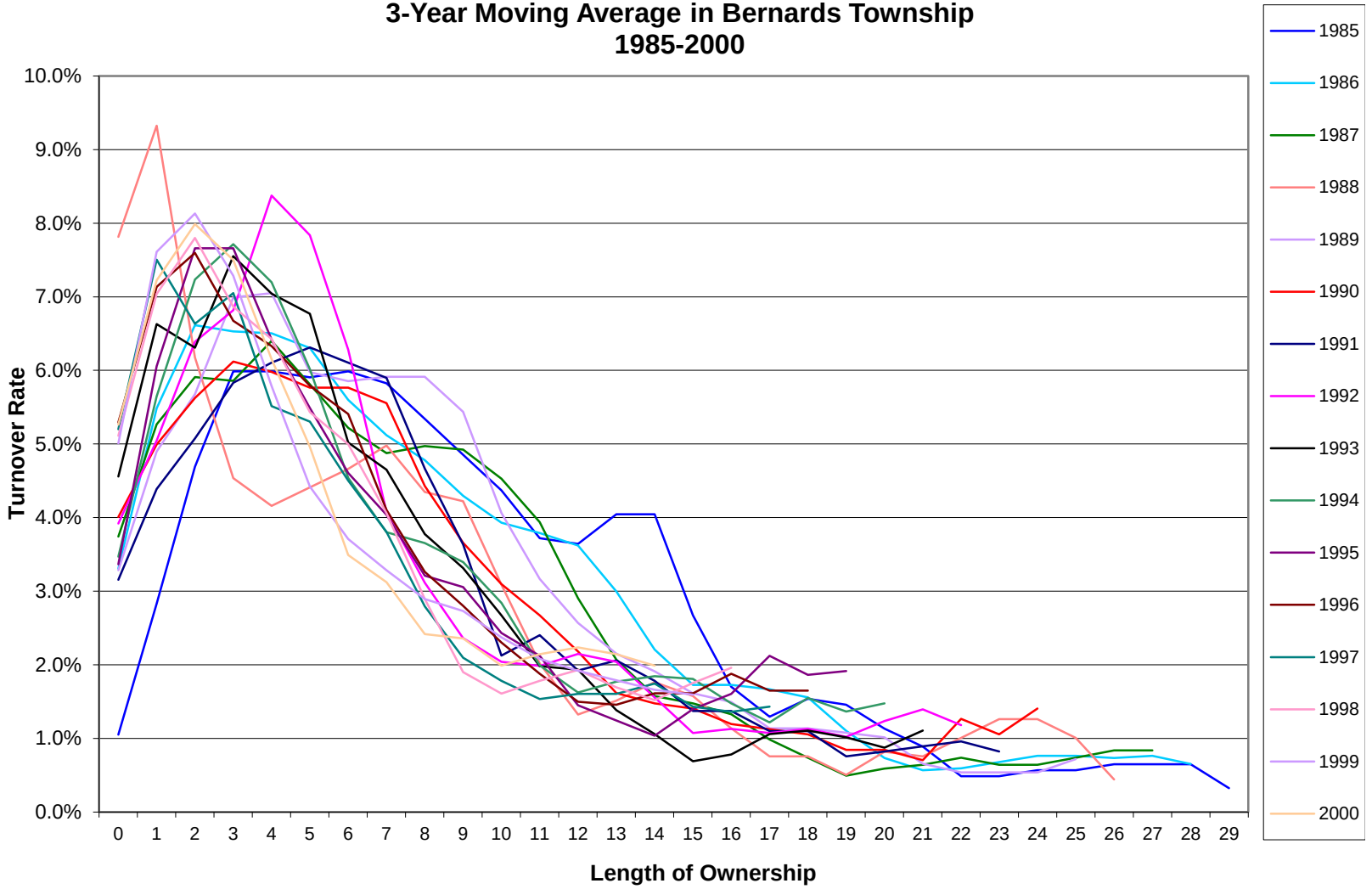
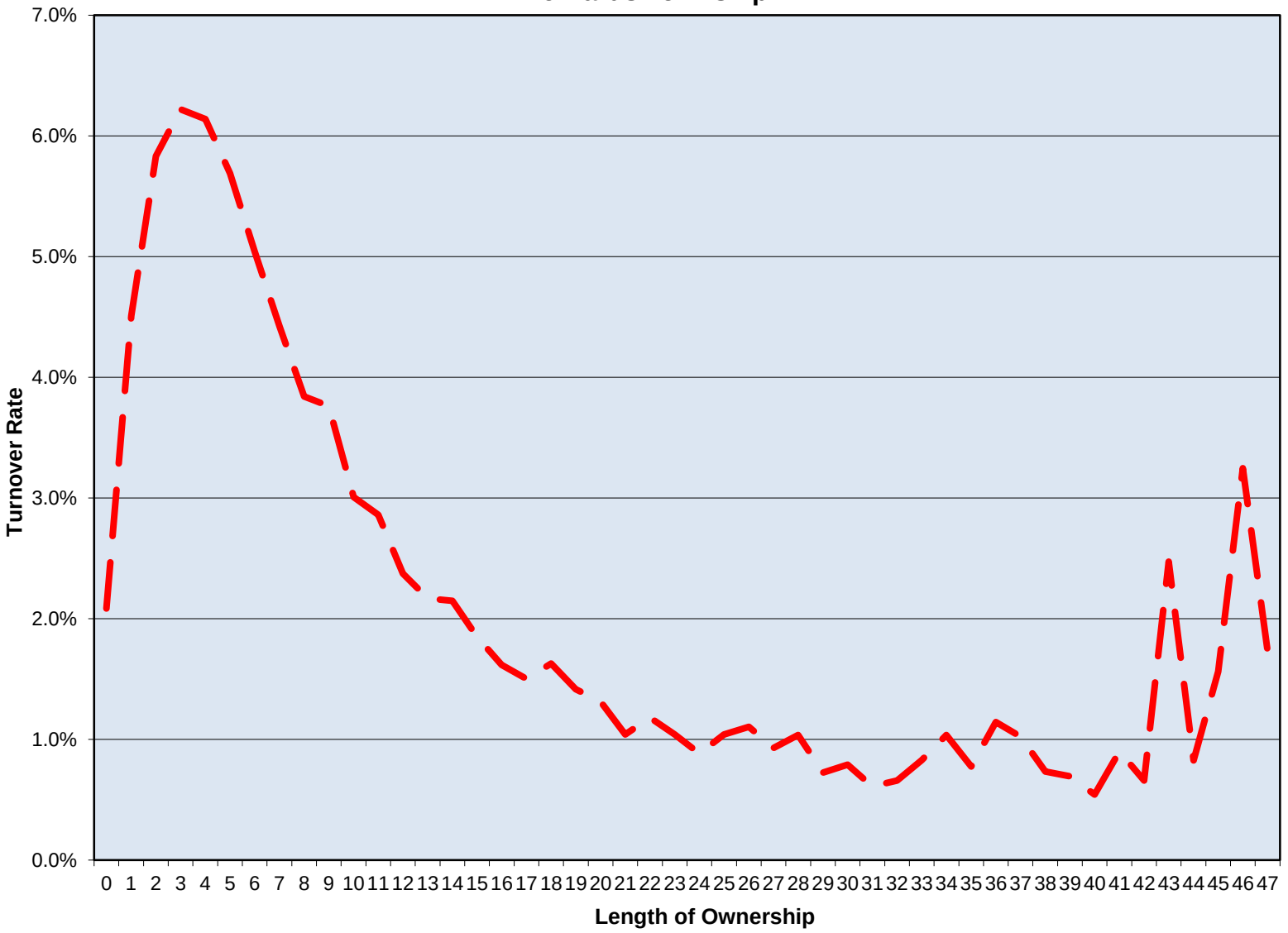


Figure 35
Historical Weighted-Average Turnover Rates by Length of Ownership
Bernards Township

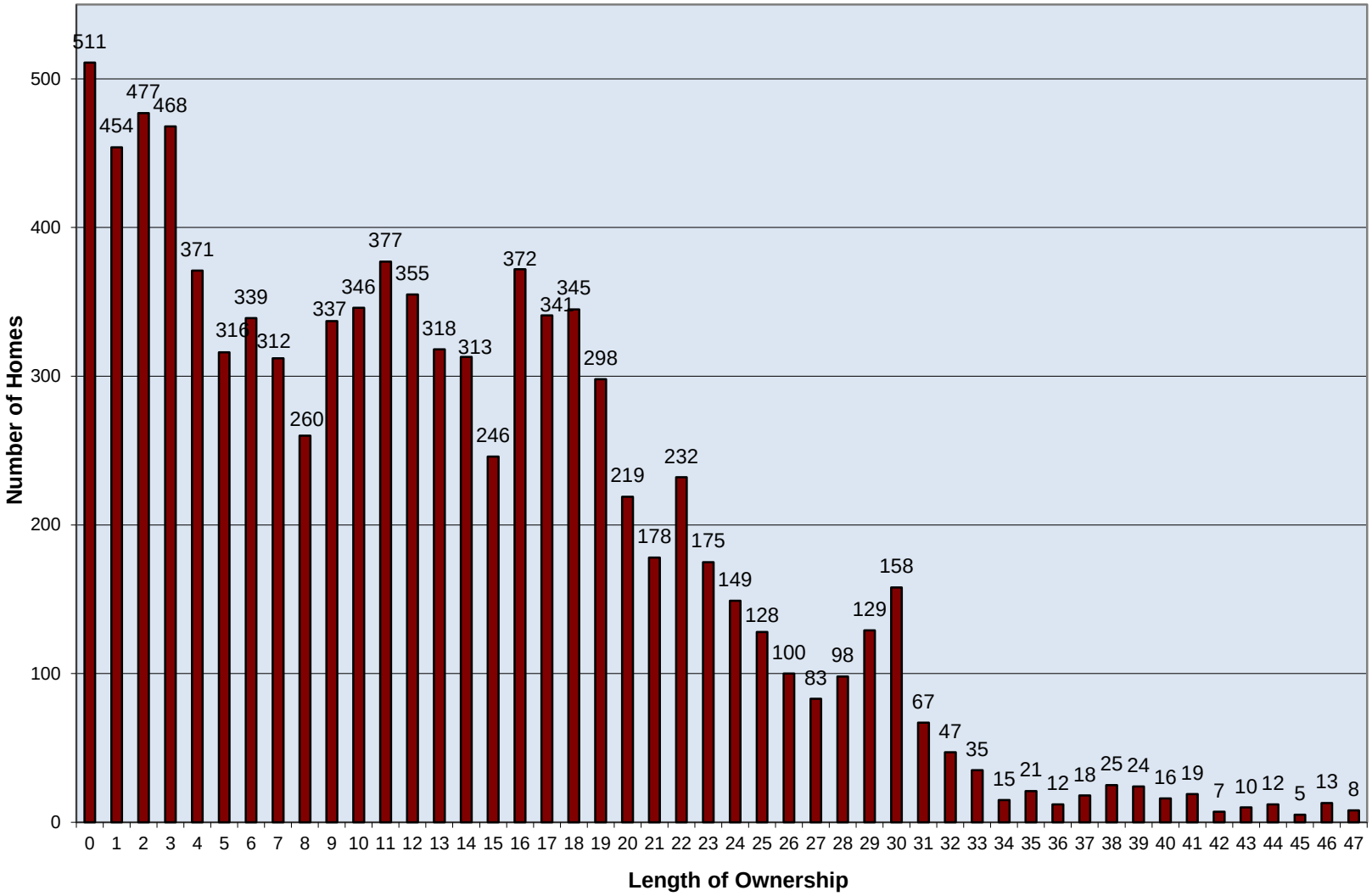


Current Distribution of Homes by Length of Ownership

The second input variable, current length of ownership, was computed by simply subtracting the most recent sale date from 2016. As discussed previously, determining the most recent sale date was not always obvious. Some of the most recent sale dates had a sales price of $1 or $100. These "paper sales" were coded in the database as a non-usable deed transaction. These transactions include sales between members of the immediate family, resulting in a change in title but often not a change of the occupant. In these instances, the sales were excluded from the analysis and the next most recent sale date was used instead.

Figure 36 shows the current length of ownership distribution for 1- to 4-family homes in Bernards. Since some homes did not have a sales date, they have been owned more than 47 years, as the oldest sales data were from 1969. At zero years of ownership, there are 511 homes, which corresponds to homes sold in the last year. In general, the number of homes then steadily decreases as the length of ownership increases. The increase in the number of homes at 9-13 years of ownership corresponds to the strong housing market and high number of sales that occurred from 2003-2007. After 33 years of ownership, the number of homes at each ownership length is very small with fewer than 26 homes at each year of ownership. A total of 385 homes (4.0%) have never been sold (or had a "paper sale") and therefore have been owned 48 or more years. This is not shown in the figure, as it would skew the end of the distribution.

Figure 36
Current Number of Homes by Length of Ownership
Bernards Township



Student Yields by Length of Ownership

The third variable, student yields by length of ownership, was determined by linking the parcel-level property database with 2017-18 student address data, which was provided by the school district. Table 28 shows the student yields by length of ownership for the PK-12 student population. It is expected that longer-held homes will have fewer children, as they would have graduated from the district. In 2017-18, there were 5,470 resident students from Bernards according to the district's database. Of this number, we were able to match 5,147 children (94.1%) to an address in the Bernards property database that had a Class 2 property code (1- to 4-family homes). Upon further research, the majority of the remaining children lived in apartments, farms, or were children of the school district's faculty residing in other towns. These children were excluded from the analysis.

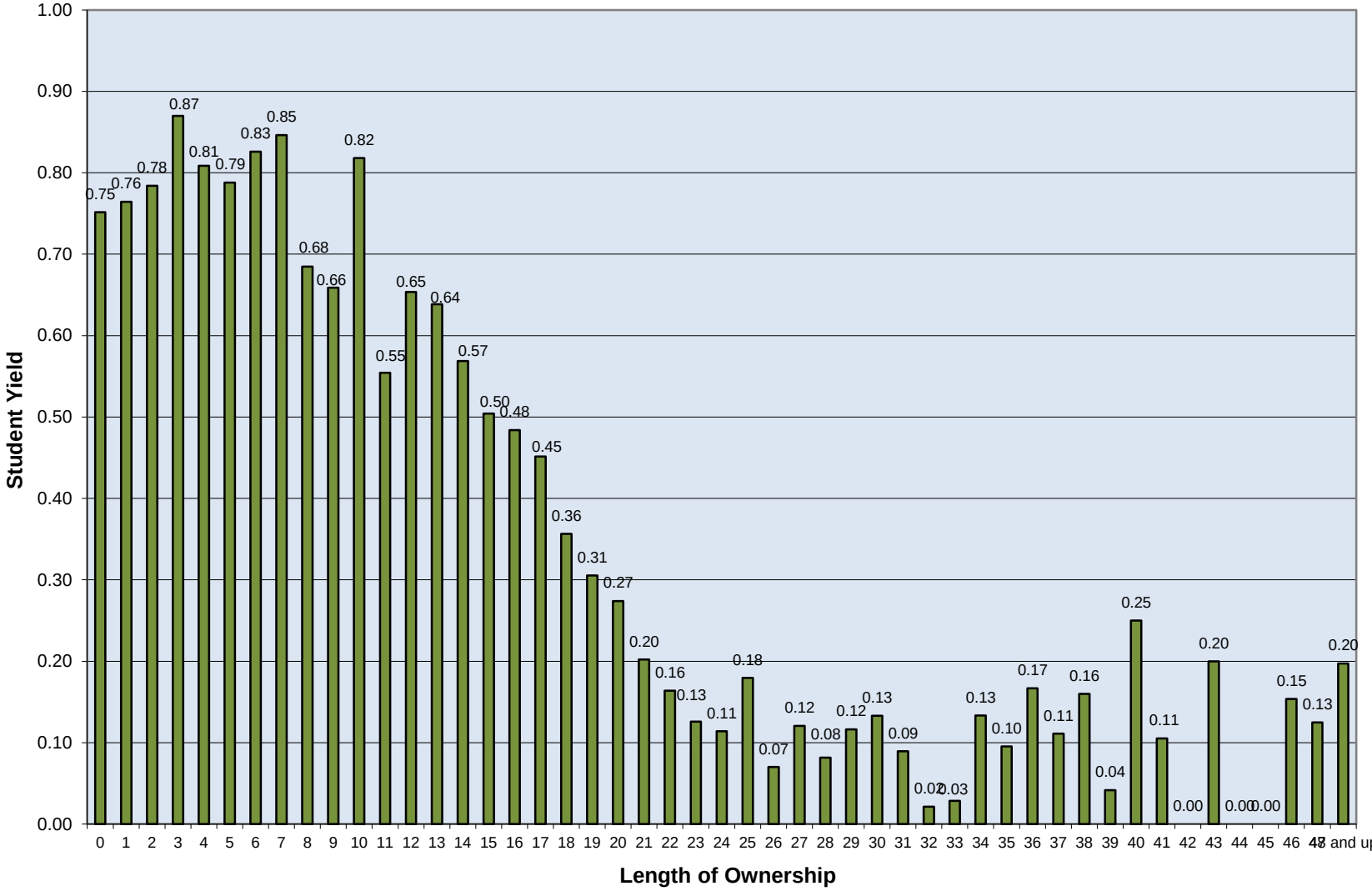
Figure 37 shows student yields by length of ownership. In the first seven years of ownership, student yields are fairly stable, ranging from 0.75-0.87 public school children per home. With the exception of a spike in the student yield at ten years of ownership, student yields then steadily decline as length of ownership increases. After 20 years of ownership, student yields are typically below 0.20 children per home. While there are several spikes in the student yield after 20 years of ownership, this is misleading since there are very few homes at these lengths of ownership and one or two additional students can have a large impact on the student yield.

It should be noted that student yields by length of ownership may change over time. The distribution shown represents the student yields based on the 2017-18 enrollment data and should be considered as a "snapshot" in time. The student yield distribution can be affected by a number of factors, such as an inward migration of students due to a school district's excellent reputation, or perhaps a change in the age structure of the community where there may be more or less children as a percentage of the population. There is no way of predicting what the future student yield distribution by length of ownership will be.

Table 28
Student Yields by Current Length of Ownership

Years of Ownership	Number of Homes	Number of Students	Student Yield
0	511	384	0.75
1	454	347	0.76
2	477	374	0.78
3	468	407	0.87
4	371	300	0.81
5	316	249	0.79
6	339	280	0.83
7	312	264	0.85
8	260	178	0.68
9	337	222	0.66
10	346	283	0.82
11	377	209	0.55
12	355	232	0.65
13	318	203	0.64
14	313	178	0.57
15	246	124	0.50
16	372	180	0.48
17	341	154	0.45
18	345	123	0.36
19	298	91	0.31
20	219	60	0.27
21	178	36	0.20
22	232	38	0.16
23	175	22	0.13
24	149	17	0.11
25	128	23	0.18
26	100	7	0.07
27	83	10	0.12
28	98	8	0.08
29	129	15	0.12
30	158	21	0.13
31	67	6	0.09
32	47	1	0.02
33	35	1	0.03
34	15	2	0.13
35	21	2	0.10
36	12	2	0.17
37	18	2	0.11
38	25	4	0.16
39	24	1	0.04
40	16	4	0.25
41	19	2	0.11
42	7	0	0.00
43	10	2	0.20
44	12	0	0.00
45	5	0	0.00
46	13	2	0.15
47	8	1	0.13
48+	385	76	0.20

Figure 37
Student Yields by Length of Ownership
Bernards Township



Enrollment Projections Based on Housing Turnover

Projecting enrollment based on housing turnover is a process very similar to the Cohort-Survival Ratio ("CSR") method, which is often used by demographers to project future student enrollments. As discussed previously, when using CSR, enrollments are projected based on historical "survival" ratios of students from one grade to the next. Average survival ratios are used to advance the current number of students into future grades. In the housing turnover method, instead of students, the current length of home ownership distribution and historical turnover rates are used to project the future number of homes by either advancing homes to one more year of ownership, or if they are sold, returning them to zero years of ownership. For example, if there are 100 homes with eight years of ownership and the historical turnover rate for this length of ownership is 3%, 97 homes will gain another year of ownership while three homes will be sold and will have zero years of ownership in the next year. This process of aging homes based on historical turnover rates was completed for a five-year period.

Table 29 shows the process in greater detail. The Bernards historical weighted average turnover rates by length of ownership are shown along with the current length of ownership distribution. The projected number of turnovers is computed (Column D) by multiplying the turnover rate at a length of ownership (Column B) by the number of homes at that same length of ownership (Column C). The number of homes that "survive" to be one year older is shown in Column E. Column F is identical to Column E except that the projected total number of homes sold in 2017, 277 from Column D, becomes the number of homes with zero years of ownership in the following year.

Table 30 following shows the projected number of homes by length of ownership in Bernards for 2017-2021 using the method described above assuming that the turnover rates presented in the table will continue into the future. However, if the historical average turnover rates are used, the predicted annual number of home sales (277 as shown in the table) would be much lower than that which occurred in 2016 (511). The turnover rates reflect home selling patterns from an older historical period that may not be reflective of the current housing market. To increase the number of sales to current levels, the average turnover rates for housing cohorts from 1996-2006 were used for homes with 0-10 years of ownership, as this reflects a time period when the housing resale market was fairly strong and may best reflect the current and future housing market. In addition, the maximum turnover rate from each of the last twenty years was used for 11-19 years of ownership. Finally, one of the key variables affecting future enrollments in the housing turnover model is the number of long-held homes. As shown previously, student yields for homes with 21 or more years of ownership are typically less than 0.20. The greater the number of long-held homes in a district, the greater the probability that enrollment will decline since yields are low for long-held homes. For enrollments to be stable (or to increase), turnover rates would need to be higher for homes with 21 or more years of ownership, to prevent them from advancing into long-held lengths of ownership with low student yields. Therefore, turnover rates for homes with 21 or more years of ownership were increased to 9.50% to raise the number of sales to current levels. Simply stated, this scenario seeks to minimize the number of homes with long lengths of ownership and low student yields while maximizing the number of homes with short lengths of ownership and high student yields, and aims to keep the number of home sales at or near current levels.

Table 29
Sample of Process in Forecasting Length of Ownership

A	B	C	D	E	F
Years of Ownership	**Historical Average Turnover Rate**	**Current Number of Homes by Length of Ownership In Year Y**	**Turnovers During Year Y (D = B*C)**	**Unsold Homes During Year Y Homes Now Have One More Year of Ownership (E = C-D)**	**Forecasted Length of Ownership Distribution (Year Y + 1)**
0	2.1%	511	11		**277**
1	4.5%	454	20	500	500
2	5.8%	477	28	434	434
3	6.2%	468	29	449	449
4	6.1%	371	23	439	439
5	5.7%	316	18	348	348
6	5.0%	339	17	298	298
7	4.4%	312	14	322	322
8	3.8%	260	10	298	298
9	3.8%	337	13	250	250
10	3.0%	346	10	324	324
11	2.9%	377	11	336	336
12	2.4%	355	8	366	366
13	2.2%	318	7	347	347
14	2.1%	313	7	311	311
15	1.8%	246	5	306	306
16	1.6%	372	6	241	241
17	1.5%	341	5	366	366
18	1.6%	345	6	336	336
19	1.4%	298	4	339	339
20	1.3%	219	3	294	294
21	1.0%	178	2	216	216
22	1.2%	232	3	176	176
23	1.0%	175	2	229	229
24	0.9%	149	1	173	173
25	1.0%	128	1	148	148
26	1.1%	100	1	127	127
27	0.9%	83	1	99	99
28	1.0%	98	1	82	82
29	0.7%	129	1	97	97
30	0.8%	158	1	128	128
31	0.6%	67	0	157	157
32	0.7%	47	0	67	67
33	0.8%	35	0	47	47
34	1.0%	15	0	35	35
35	0.8%	21	0	15	15
36	1.1%	12	0	21	21
37	1.0%	18	0	12	12
38	0.7%	25	0	18	18
39	0.7%	24	0	25	25
40	0.5%	16	0	24	24
41	0.9%	19	0	16	16
42	0.7%	7	0	19	19
43	2.5%	10	0	7	7
44	0.8%	12	0	10	10
45	1.6%	5	0	12	12
46	3.2%	13	0	5	5
47	1.7%	8	0	13	13
48 and up	2.0% (est.)	385	8	385	385
Total		**9,544**	**277**	**9,544**	**9,544**

.

Table 30
Projected Number of Homes in Bernards Township by Length of Ownership

Years of Ownership	Avg. Turnover Rate	Turnover Rate Used	2016 (Actual)	2017	2018	2019	2020	2021
0	2.1%	2.9%	511	507	516	521	521	527
1	4.5%	5.2%	454	496	492	501	506	506
2	5.8%	6.8%	477	430	470	466	475	480
3	6.2%	6.6%	468	445	401	438	435	443
4	6.1%	5.7%	371	437	415	374	409	406
5	5.7%	5.0%	316	350	412	391	353	386
6	5.0%	4.3%	339	300	332	391	371	335
7	4.4%	3.9%	312	324	287	318	374	355
8	3.8%	3.2%	260	300	311	276	306	360
9	3.8%	3.1%	337	252	290	301	267	296
10	3.0%	2.4%	346	327	244	281	292	259
11	2.9%	4.7%	377	338	319	238	274	285
12	2.4%	4.0%	355	359	322	304	227	261
13	2.2%	3.1%	318	341	345	309	292	218
14	2.1%	2.8%	313	308	330	334	299	283
15	1.8%	2.5%	246	304	300	321	325	291
16	1.6%	2.3%	372	240	297	293	313	317
17	1.5%	2.5%	341	363	234	290	286	306
18	1.6%	2.1%	345	333	354	228	283	279
19	1.4%	2.6%	298	338	326	347	223	277
20	1.3%	9.5%	219	290	329	317	338	217
21	1.0%	9.5%	178	198	262	298	287	306
22	1.2%	9.5%	232	161	179	237	270	260
23	1.0%	9.5%	175	210	146	162	214	244
24	0.9%	9.5%	149	158	190	132	147	194
25	1.0%	9.5%	128	135	143	172	119	133
26	1.1%	9.5%	100	116	122	129	156	108
27	0.9%	9.5%	83	90	105	110	117	141
28	1.0%	9.5%	98	75	81	95	100	106
29	0.7%	9.5%	129	89	68	73	86	90
30	0.8%	9.5%	158	117	81	62	66	78
31	0.6%	9.5%	67	143	106	73	56	60
32	0.7%	9.5%	47	61	129	96	66	51
33	0.8%	9.5%	35	43	55	117	87	60
34	1.0%	9.5%	15	32	39	50	106	79
35	0.8%	9.5%	21	14	29	35	45	96
36	1.1%	9.5%	12	19	13	26	32	41
37	1.0%	9.5%	18	11	17	12	24	29
38	0.7%	9.5%	25	16	10	15	11	22
39	0.7%	9.5%	24	23	14	9	14	10
40	0.5%	9.5%	16	22	21	13	8	13
41	0.9%	9.5%	19	14	20	19	12	7
42	0.7%	9.5%	7	17	13	18	17	11
43	2.5%	9.5%	10	6	15	12	16	15
44	0.8%	9.5%	12	9	5	14	11	14
45	1.6%	9.5%	5	11	8	5	13	10
46	3.2%	9.5%	13	5	10	7	5	12
47	1.7%	9.5%	8	12	5	9	6	5
48 and up	2.0% (est.)	9.5%	385	355	332	305	284	262
Total			**9,544**	**9,544**	**9,544**	**9,544**	**9,544**	**9,544**

Finally, Table 31 shows the projected number of Bernards students by length of ownership from 2017-2021. This was computed by multiplying the projected number of homes by length of ownership with the student yields by length of ownership found in Table 28. As a check of the model, the actual number of students in 2017 in shown for each length of ownership for comparison of the projected number of students in 2017. After summing the projected number of students at each length of ownership, the result is the total number of students residing in Class 2 housing units in that year. This value is then added to the number of resident students living in apartment units, farms, or were children of the school district's faculty residing in other towns. This value was assumed to remain constant throughout the projection period. The results in Table 31 assume that student yields and turnover rates by length of ownership will remain constant over the five-year projection period. As previously stated, student yields are likely to change over time, but there is no way of projecting what they might be. Similarly, the model assumes that turnover rates by length of ownership will remain constant over time. In this scenario, enrollment is projected to slowly decline throughout the projection period and be 5,379 in 2021.

It should be clearly stated that the purpose of this analysis is <u>not</u> to use the projections for future planning since the CSR method is the most accurate method available. Rather, it is an independent process to see whether future enrollments may be affected by housing turnover. In this case, enrollment is not likely to grow significantly due to housing turnover; other factors, such as higher fertility rates or new residential construction, would lead to enrollment growth.

Table 31
Projected Number of Bernards Students
Based on Length of Ownership and Student Yields

Years of Ownership	Yield	2017 (Actual)	2017	2018	2019	2020	2021
0	0.75	384	381	388	392	392	396
1	0.76	347	379	376	383	387	387
2	0.78	374	337	369	365	372	376
3	0.87	407	387	349	381	378	385
4	0.81	300	353	336	302	331	328
5	0.79	249	276	325	308	278	304
6	0.83	280	248	274	323	306	277
7	0.85	264	274	243	269	316	300
8	0.68	178	205	213	189	209	246
9	0.66	222	166	191	198	176	195
10	0.82	283	267	200	230	239	212
11	0.55	209	187	177	132	152	158
12	0.65	232	235	210	199	148	171
13	0.64	203	218	220	197	186	139
14	0.57	178	175	188	190	170	161
15	0.50	124	153	151	162	164	147
16	0.48	180	116	144	142	151	153
17	0.45	154	164	106	131	129	138
18	0.36	123	119	126	81	101	99
19	0.31	91	103	100	106	68	85
20	0.27	60	79	90	87	93	59
21	0.20	36	40	53	60	58	62
22	0.16	38	26	29	39	44	43
23	0.13	22	26	18	20	27	31
24	0.11	17	18	22	15	17	22
25	0.18	23	24	26	31	21	24
26	0.07	7	8	9	9	11	8
27	0.12	10	11	13	13	14	17
28	0.08	8	6	7	8	8	9
29	0.12	15	10	8	8	10	10
30	0.13	21	16	11	8	9	10
31	0.09	6	13	9	7	5	5
32	0.02	1	1	3	2	1	1
33	0.03	1	1	2	3	2	2
34	0.13	2	4	5	7	14	11
35	0.10	2	1	3	3	4	9
36	0.17	2	3	2	4	5	7
37	0.11	2	1	2	1	3	3
38	0.16	4	3	2	2	2	4
39	0.04	1	1	1	0	1	0
40	0.25	4	6	5	3	2	3
41	0.11	2	1	2	2	1	1
42	0.00	0	0	0	0	0	0
43	0.20	2	1	3	2	3	3
44	0.00	0	0	0	0	0	0
45	0.00	0	0	0	0	0	0
46	0.15	2	1	2	1	1	2
47	0.13	1	2	1	1	1	1
48 and up	0.20	76	70	66	60	56	52
Total Resident Students		**5,147**	**5,116**	**5,080**	**5,076**	**5,066**	**5,056**
Students from Apts. Farms, etc. (constant)		**323**	**323**	**323**	**323**	**323**	**323**
Total		**5,470**	**5,439**	**5,403**	**5,399**	**5,389**	**5,379**