STATISTICAL FORECASTING LLC

Demographic Study

for the

School District of the Chathams

October 2022

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Executive Summary

Statistical Forecasting LLC ("Statistical Forecasting") completed a demographic study update for the School District of the Chathams, projecting grade-by-grade enrollments from 2022-23 through 2026-27, a five-year period. The previous study was completed for the district in May 2018. In addition, the following tasks were completed:

- analyzed community population trends and age structure, demographic characteristics, birth counts, and fertility rates,
- examined historical enrollment trends districtwide, by grade configuration (PK-3, 4-5, 6-8, and 9-12), and by school,
- determined historical birth counts for each elementary attendance area,
- computed student yields by housing type (e.g., one- to four-family homes, townhouses/condominiums, and apartments),
- compared building capacities to current and projected enrollments,
- researched new housing starts and the impact on the school district, and
- projected enrollments, in a totally independent analysis, based on student yields and housing turnover rates (resales) in Chatham Borough and Chatham Township.

Community Overviews

In the 2020 Census, Chatham Borough had 9,212 residents, which is a gain of 250 persons from 2010. Population projections, which were prepared by the North Jersey Transportation Planning Authority ("NJTPA"), forecast the population to be 9,569 in 2040, which would be a 3.9% increase from the 2020 Census and a gain of 357 persons.

In Chatham Township, there were 10,983 residents in 2020, which is a gain of 531 persons from the 2010 Census. Forecasts prepared by the NJTPA project the population to be 11,187 in 2040, which would be a 1.9% increase from the 2020 Census and a gain of 204 persons.

While Whites are the largest race in Chatham Borough, their population is declining. In the 2020 Census, Chatham Borough was 77.7% White as compared to 87.3% in 2010, which is a loss of 9.6 percentage points. Asians were the second-largest race at 9.2% in 2020, which is a gain of 4.4 percentage points from the 2010 percentage (4.8%). Hispanics were the third-largest race, consisting of 7.3% of the population in 2020.

Whites are also the largest race in Chatham Township and their population is also declining. In 2020, Chatham Township was 77.8% White as compared to 88.0% in 2010, which is a loss of 10.2 percentage points. Asians were the second-largest race at 12.6% in 2020, which is double the 2010 percentage (6.3%). Hispanics were the third-largest race, consisting of 4.7% of the population in 2020.

With respect to nativity, 14.2% of Chatham Borough residents and 15.4% of Chatham Township residents are foreign-born, which is less than that of New Jersey (22.7%). China and India are the largest sources of foreign-born persons in both communities.

Historical Enrollment Trends

Historical enrollments were analyzed from 2012-13 through 2021-22, a ten-year period. Enrollments slowly increased through 2016-17 before reversing trend. Enrollments have declined annually for the last five years. In the last two years, there has been a decline of 309 students, which is likely related to the coronavirus pandemic. In 2021-22, enrollment is 3,732, which represents a decline of 378 students (-9.2%) from the 2012-13 enrollment of 4,110.

For grades PK-3, enrollments have declined annually over the last decade. In 2021-22, enrollment is 973, which is a decline of 323 students from the 2012-13 enrollment of 1,296.

For grades 4-5 in Lafayette School, enrollments were fairly stable from 2012-13 to 2017-18 before declining in the last four years. Enrollment is 575 in 2021-22, which is a decline of 120 students from the 2012-13 enrollment of 695.

At Chatham Middle School (6-8), enrollments increased through 2016-17 before reversing trend. Enrollments have declined annually for the last five years. In 2021-22, enrollment is 920, which is a decline of 41 students from the 2012-13 enrollment of 961.

At Chatham High School (9-12), enrollments increased through 2019-20 before reversing trend. Enrollment is 1,264 in 2021-22, which represents a gain of 106 students from the 2012-13 enrollment of 1,158.

First Grade Replacements

First grade replacements were analyzed to determine whether there was any relationship between overall enrollment change and first grade replacement, which is the numerical difference between the number of graduating 12^{th} graders and the number of entering first grade students. Typically, the outgoing 12^{th} grade student population is compared to the incoming kindergarten class. However, since the district has a half-day kindergarten program, it is more appropriate to compare the twelfth grade student population to the first grade student population, as the district gains a significant number of students from kindergarten to first grade when parents elect to send their child to a full-day kindergarten program elsewhere before enrolling them in the public school district for the first grade. In six of the last nine years, the district has experienced negative first grade replacement, ranging from 4.5-132 students per year, with the magnitude increasing over time. Negative first grade replacement occurs when the number of first grade students entering the district is less than the number of graduating twelfth grade students from the prior year.

In the last four years, the district's losses due to negative first grade replacement were compounded by the net outward migration of students in the other grades (1 to 2, 2 to 3, etc.), resulting in an even larger enrollment decline. This was confirmed as eight (8) of the 13 average survival ratios in the five-year trend were below 1.000.

Birth Counts

The number of births from 2007-2020 in Chatham Borough and Chatham Township was used to project kindergarten enrollments five years later. Over this time period, the aggregated annual number of births steadily declined through 2014 before stabilizing. In 2020, there were 156 births, which are 116 fewer births than in 2007 (272). As a result of the decline in the number of births, kindergarten enrollment has declined from 264 in 2012-13 to 179 in 2021-22, which is a decline of 85 students.

Births were also tabulated by elementary attendance area from 2007-2020. When comparing birth counts in 2007 to those in 2020, each attendance area had fewer births in 2020 as compared to 2007. The Washington Avenue attendance area had the largest decline (-44) in the birth count over this time period.

Upon aggregating the number of births by elementary attendance area from 2007-2020, the Washington Avenue attendance area had the greatest number of births (879) over this time period while the Milton Avenue attendance area had the fewest (778).

Population Age Structure

Age-sex diagrams were created from the 2010 Census and the 2016-2020 American Community Survey ("ACS") for Chatham Borough and Chatham Township to show the percentage of males and females in each age class. In Chatham Borough, the largest number of individuals in 2010 was aged 5-9 for both genders, which corresponds approximately with children in grades K-4. In communities with little inward or outward migration and low mortality, the largest cohort in subsequent years is typically the next oldest cohort as people advance in age. As such, the largest cohort in the 2016-2020 ACS was aged 10-14 for males (children in grades 5-9) as they aged in place. However, the largest cohort for females was the 50-54 age group. As the largest group for females in the 2016-2020 ACS was not the next oldest cohort, migration is likely occurring in the borough.

In Chatham Township, the largest cohort in 2010 was aged 45-49 for both males and females. However, in the 2016-2020 ACS, the largest cohort was the 10-14 age group for males and was the 45-49 age cohort for females. As the largest groups in the 2016-2020 ACS were not the next oldest cohorts, migration is likely occurring in the township.

Potential New Housing

Chatham Borough municipal representatives provided information regarding current and future residential development in the community. In November 2016, Chatham Borough approved a settlement agreement with the Fair Share Housing Center regarding its affordable housing obligation, which has since been amended. In total, there is the potential for 268 non age-restricted housing units in three separate developments, all of which are multi-family units such as apartments or condominiums. Of this amount, 53 units (20%) will be set aside to meet affordable housing requirements.

Chatham Township municipal representatives also provided information regarding current and future residential development in the community. In December 2018, Chatham Township approved a settlement agreement with the Fair Share Housing Center regarding its affordable housing obligation, which has since been amended. In total, there is the potential for 140 non age-restricted housing units in three separate developments, all of which are multi-family units. Of this amount, 86 units (61%) will be set aside to meet affordable housing requirements.

An estimate was made of the number of public school children that could potentially come from the approved and proposed housing developments in the two communities. **It should be clearly stated that this is a rough estimate, as the bedroom distribution of some of the developments was unavailable, which is needed to compute the estimated number of public school children. In addition, one development has not been approved and may not come to fruition, may change in scope before being approved, or may be constructed and occupied outside of the five-year enrollment projection timeframe.** In total, 95 public school children (K-5 = 42, 6-8 = 24, and 9-12 = 29) are projected to be generated. The baseline enrollment projections were modified in the affected attendance areas to account for the additional children from the new housing developments.

Student Yields

Student yields by length of ownership of one- to four-family homes were determined by joining the parcel-level property databases of Chatham Borough and Chatham Township with the 2021-22 student address database provided by the school district, where the majority of units were detached single-family homes or duplexes. Excluding age-restricted housing units, condominiums, and townhouses, the overall student yield (K-12) of one- to four-family homes was computed to be 0.853.

Student yields were also computed for townhouses and condominiums. A total of 87 public school children (K-12) were identified living in 1,044 units, which is an average student yield of 0.083. In general, student yields are quite low. Of the two communities, Chatham Borough (0.158) had the larger average student yield. The largest student yields, in developments with at least 25 units, are in Chatham Court in Chatham Borough (0.184) and Coachlight Square in Chatham Township (0.167).

Finally, student yields were computed for apartment complexes in Chatham Borough and Chatham Township. A total of 99 public school children (K-12) were identified living in 782 units, which is an average student yield of 0.127. Of the two communities, Chatham Borough (0.198) had the larger average student yield. The largest student yields, in developments with at least 25 units, are in Spring Brook at Chatham (0.340) and Jackson House (0.257), both of which are located in Chatham Borough.

Home Sales

The number of annual home sales was tabulated for each community from 1994-2021. In Chatham Borough, home sales peaked at 225 in 1998 before declining to 97 in 2012 due to the housing market crash and banking crisis. Since then, home sales have rebounded and have

steadily increased. In 2021, there were 201 sales, which is similar to the annual number of sales prior to the housing market crash and banking crisis. Regarding Chatham Township, the number of sales declined to 140 in 2009 due to the housing market crash and banking crisis. From 2013-2021, home sales have increased. In 2021, there were 259 sales, which is similar to the annual number of sales prior to the housing market crash and banking crisis.

Enrollment Projections

PK-12 enrollments were computed for a five-year period, 2022-23 through 2026-27, in two separate projections (baseline and adjusted for housing growth). In the baseline projections, which assume that the proposed housing developments do not come to fruition or are not occupied within the anticipated construction timeline, enrollment is projected to be 3,315 in 2026-27, which would be a decline of 417 students from the 2021-22 enrollment of 3,732. In the adjusted projections, enrollment is projected to be 3,430 in 2026-27, which would be a decline of 302 students from the 2021-22 enrollment.

For the elementary grades (PK-3), enrollments are projected to increase throughout the projection period in both the baseline and adjusted projections. In the baseline projections, enrollment is projected to be 1,080 in 2026-27, which would be a gain of 107 students from the 2021-22 enrollment of 973. In the adjusted projections, enrollment is projected to be 1,107 in 2026-27, which would be a gain of 134 students from the 2021-22 enrollment.

For grades 4-5 at Lafayette, enrollments are projected to decline for the next three years before reversing trend in both the baseline and adjusted projections. Enrollment is projected to be 525 in 2026-27 in the baseline projections, which would be a decline of 50 students from the 2021-22 enrollment of 575. In the adjusted projections, enrollment is projected to be 545 in 2026-27, which would be a decline of 30 students from the 2021-22 enrollment.

For grades 6-8 at Chatham Middle School, enrollments are projected to decline throughout the projection period in both the baseline and adjusted projections. In the baseline projections, enrollment is projected to be 674 in 2026-27, which would be a decline of 246 students from the 2021-22 enrollment of 920. In the adjusted projections, enrollment is projected to be 709 in 2026-27, which would be a decline of 211 students from the 2021-22 enrollment.

For grades 9-12 at Chatham High School, enrollments are also projected to decline throughout the projection period in both the baseline and adjusted projections. In the baseline projections, enrollment is projected to be 1,036 in 2026-27, which would be a decline of 228 students from the 2021-22 enrollment of 1,264. In the adjusted projections, enrollment is projected to be 1,069 in 2026-27, which would be a decline of 195 students from the 2021-22 enrollment.

Enrollments were also computed for each elementary school in the district. As these are smaller subgroups of the overall population as compared to using districtwide grade counts, the reliability of the school projections are lower than the overall districtwide projections. In general, the smaller the forecasted population, the higher the probability of error associated with the projection.

Building Capacities

The capacities of the schools in the district were compared to both the current enrollments in 2021-22 and the enrollment projections in the 2026-27 school year. Using the district's building capacities, the differences between capacity and current/projected number of students were computed. Positive values indicate available extra seating while negative values indicate inadequate seating (also known as "unhoused students"). It should be noted that the capacity values are not fixed and can change from year-to-year based on classroom usage. For instance, additional special education classes in a building would reduce the building's capacity. On the other hand, districts with unhoused students can accommodate these children by increasing class sizes, which in turn increases the school's capacity. As such, the capacity of a school is not a fixed value and can be changed depending on how the building is used.

In the elementary schools (PK-3), there is currently a surplus of seating in each school in 2021-22, with the largest being in Southern Boulevard (+106). Lafayette (4-5) also has surplus seating (+57). In the upper level schools, both Chatham Middle School (+32) and Chatham High School (+37) have surplus seating in 2021-22, but the surplus is the smallest of the district's six schools.

By 2026-27, each of the elementary schools is projected to have surplus seating, with the largest being at Washington Avenue (+73). Lafayette (+87) is projected to have a greater number of surplus seats in 2026-27. Due to a projected large decline in enrollment, Chatham Middle School (+243) and Chatham High School (+232) are projected to have a much greater number of surplus seats in 2026-27.

Housing Turnover

Using historical housing turnover rates by length of ownership for one- to four-family homes in Chatham Borough and Chatham Township, along with student yields by length of ownership, the number of students was projected from 2022-2026 in a completely independent analysis. 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, and
3. student yields by length of ownership.

To compute turnover rates, home sales were obtained from 1994-2021, a period of 27 years. Turnover rates were greatest in homes with one year of ownership (6.2%) before declining, as turnover rates are lowest for longer lengths of ownership. For homes with 13 or more years of ownership, average turnover rates were less than 2.0%.

Student yields (children per housing unit) increase with length of ownership, peaking at 1.29 children per housing unit with eight (8) years of ownership. Student yields then begin to decline as length of ownership increases. For homes with 28 or more years of ownership, the student yield was 0.18, which is very low.

Using the housing turnover methodology, total enrollments were projected in two separate scenarios. In the first scenario, enrollment is projected to be 3,871 in 2026, which would be a gain of 123 students from the 2021-22 enrollment of 3,748, with the assumption that the turnover rate of long-held homes (28 or more years) would be much higher (5.4%) than experienced historically.

In the second scenario, enrollment is projected to be 3,745 in 2026, which would be nearly identical to the 2021-22 enrollment (3,748), with the assumption that the turnover rates of long-held homes (28 or more years) would be slightly higher than that experienced historically.

It should be clearly stated that the purpose of this analysis is not 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 the second scenario, which is more plausible, it appears enrollments are not likely to change significantly due to housing turnover, controlling for all other factors, such as fertility rates, births, inward migration, or new residential construction.

Final Thoughts

In the last five years, enrollments (PK-12) have steadily declined in the School District of the Chathams, which is projected to continue for the next five years. If not for the impending new housing developments in each community, the enrollment decline would be even greater. The additional children from the new housing developments are likely to offset some of the enrollment decline that would have occurred in the school district. The projected enrollment decline is not expected to occur equally across each of the grade configurations, as the lower elementary enrollments (PK-3) are projected to increase while the upper elementary (Lafayette), middle, and high school enrollments are projected to decline as the district's smaller existing elementary school cohorts move through the system.

In closing, it is difficult to measure the impact of the coronavirus on the school district's enrollments moving forward. In a New York Times article[1], families with financial means are leaving large metropolitan areas to reside in their second homes in rural areas or are purchasing an existing home in these new locations. These individuals can typically work remotely and are seeking to escape the pandemic. It is not clear whether these households will permanently reside in these locations or return to suburban/urban centers. While the duration of the pandemic is unknown and available data are limited, we are continuing to monitor data as it becomes available to assess its future impact on enrollments both short- and long-term.

[1] (https://www.nytimes.com/2020/09/26/us/coronavirus-vermont-transplants.html)

Introduction

Statistical Forecasting LLC ("Statistical Forecasting") completed a demographic study update for the School District of the Chathams, projecting grade-by-grade enrollments from 2022-23 through 2026-27, a five-year period. The previous study was completed for the district in May 2018. In addition, the following tasks were completed:

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- projected enrollments, in a totally independent analysis, based on student yields and housing turnover rates (resales) in Chatham Borough and Chatham Township.

Enrollment Projections from May 2018 Report

In our previous demographic study, enrollments were projected from 2018-19 through 2022-23, a five-year projection period. Table 1 compares the projected enrollments (PK-12) to the actual enrollments for the first four years of the projection period. The table shows the numerical differences and percent errors by year. Positive error rates indicate over-projections while negative error rates indicate under-projections.

Table 1
Comparison of Projected to Actual Enrollments (PK-12) from May 2018 Report

Year	Projected	Actual	Difference	% Error
2018-19	4,162	4,118.5	+43.5	**+1.1%**
2019-20	4,127	4,041	+86	**+2.1%**
2020-21	4,106	3,901.5	+204.5	**+5.2%**
2021-22	4,021	3,732	+289	**+7.7%**

In our previous study, enrollments were projected to decline throughout the projection period. While enrollments did decline each year, the actual enrollment declines were much greater than anticipated, which was likely due to the coronavirus pandemic, as parents sought alternative educational experiences for their children, or may have had to relocate. In particular, there were enrollment declines of 139.5 and 169.5 students in 2020-21 and 2021-22, respectively, which represents the first two years of the coronavirus pandemic. As such, enrollments were overestimated in each year of the projection period, where error rates ranged from 1.1%-7.7% with the magnitude increasing over time. Expressed in numbers, the projections differed from actual enrollments by 43.5-289 students.

In a survey by Schellenberg and Stephens of educational planners who complete enrollment projections, two-thirds believe that an error rate of 1% per year for the total enrollment is acceptable[2]. For a five-year projection, this would mean that a 5% error rate in the fifth year would be acceptable. The projections were outside this parameter in each year of the projection period.

Table 2 compares the projected enrollments to the actual enrollments for the first four years of the projection period for the lower elementary (PK-3), upper elementary (4-5), middle (6-8), and high (9-12) school grade configurations.

At the lower elementary level (PK-3), enrollments were overestimated in each year, as error rates ranged from 1.8%-9.1% with the magnitude increasing over time. Expressed in numbers, the projections differed from actual enrollments by 20-89 students. The overestimation in 2020-21 and 2021-22 is partially due to the coronavirus pandemic, as some parents were reluctant to send their child to school and may have sought private schools that had full in-person learning rather than hybrid or remote instruction, or may have homeschooled their child. Upon further inspection, most of the error was due to over-projecting the lower elementary grades (K-1) in 2020-21, whose error was compounded in 2021-22 as the students moved through the system. Of the four grade configurations, the elementary grades had the greatest percent errors in three of the four projection years.

At the upper elementary level (4-5) in Lafayette School, enrollments were overestimated in each year, as error rates ranged from 0.1%-6.6% with the magnitude increasing over time. Expressed in numbers, the projections differed from actual enrollments by 1-38 students. Most of the overestimation occurred in 2020-21 and 2021-22, which is partially due to the coronavirus pandemic. Of the four grade configurations, the percent errors in the upper elementary grades were the lowest in three of the four projection years.

At the middle school level (6-8) in Chatham Middle School, enrollments were also overestimated in each year. Error rates ranged from 0.6%-7.8%, which corresponds to a numerical difference range of 6-72 students with the magnitude increasing over time. Most of the overestimation occurred in 2020-21 and 2021-22, which is partially due to the coronavirus pandemic.

[2] Schellenberg, S. J., & Stephens, C. E. (1987). Enrollment projection: variations on a theme. Paper presented at the Annual Meeting of the American Educational Research Association, Washington D.C., (ERIC Document Reproduction Service No. ED 283 879)

For the high school grades (9-12) at Chatham High School, enrollments were also overestimated in each year of the projection period. Error rates ranged from 1.3%-7.1%, which corresponds to a numerical difference range of 16.5-90 students with the magnitude increasing over time. The largest error, which occurred in 2021-22, was a result of the over-projected 8th grade students in 2020-21 moving up to the 9th grade in 2021-22.

Table 2
Comparison of Projected to Actual Enrollments by Grade Configuration from May 2018 Report

Year		Projected	Actual	Difference	% Error
2018-19	**Lower Elementary (PK-3)**	1,111	1,091	+20	**+1.8%**
2019-20		1,080	1,044	+36	**+3.4%**
2020-21		1,081	1,012	+69	**+6.8%**
2021-22		1,062	973	+89	**+9.1%**
Year		**Projected**	**Actual**	**Difference**	**% Error**
2018-19	**Upper Elementary (4-5)**	680	679	+1	**+0.1%**
2019-20		663	659	+4	**+0.6%**
2020-21		617	592	+25	**+4.2%**
2021-22		613	575	+38	**+6.6%**
Year		**Projected**	**Actual**	**Difference**	**% Error**
2018-19	**Middle (6-8)**	1,043	1,037	+6	**+0.6%**
2019-20		1,020	995	+25	**+2.5%**
2020-21		1,054	984	+70	**+7.1%**
2021-22		992	920	+72	**+7.8%**
Year		**Projected**	**Actual**	**Difference**	**% Error**
2018-19	**High (9-12)**	1,328	1,311.5	+16.5	**+1.3%**
2019-20		1,364	1,343	+21	**+1.6%**
2020-21		1,354	1,313.5	+40.5	**+3.1%**
2021-22		1,354	1,264	+90	**+7.1%**

At the school level, half of the survey respondents in the Schellenberg and Stephens survey believed an error rate of 3-5% in the first projection year was acceptable[3]. The error rates at Lafayette School (4-5), Chatham Middle School (6-8), and Chatham High School (9-12) were below the range of what educational planners deem acceptable. The lower elementary projections (PK-3) shown are not for an individual school, but are for the three schools combined and are therefore not compared to the acceptable error rate range.

The accuracy of the projections is contingent on the most recent historical trends continuing into the future. If there is a departure from these trends caused by, for example, migration or withdrawal of students due to the coronavirus pandemic, numerous new housing starts (or planned housing starts that do not occur), changes in school district policy, changes to immigration laws, an economic downturn, a change in the housing resale market, etc., the enrollment projections presented are less likely to be accurate in future years, as this analysis does not forecast future trends. Therefore, the projections need to be revised annually to detect potential reversals in enrollment trends. Changes in enrollment are dependent on several factors such as birth counts, migration of students into or out of the school district, the presence of charter schools, private schools, or parochial schools, and school district policy changes.

[3] ibid.

Population Trends

1. Chatham Borough

Located in Morris County, Chatham Borough contains a land area of 2.37 square miles, with an additional 0.05 square miles of water area. In the 2020 Census, Chatham Borough had 9,212 residents, which is 3,886.9 persons per square mile. Historical and projected populations for Chatham Borough from 1940-2040 are shown in Table 3 and Figure 1.

Table 3
Historical and Projected Populations for Chatham Borough
1940-2040

Year	Population	Percent Change
Historical[1]		
1940	4,888	N/A
1950	7,391	+51.2%
1960	9,517	+28.8%
1970	9,566	+0.5%
1980	8,537	-10.8%
1990	8,007	-6.2%
2000	8,460	+5.7%
2010	8,962	+5.9%
2020	9,212	+2.8%
Projected[2]		
2030	9,415	+2.2%
2040	9,569	+1.6%

Sources: [1]United States Census Bureau
[2]North Jersey Transportation Planning Authority, Inc. (2017)

Chatham Borough's population steadily increased and nearly doubled from 1940-1970, with its greatest gain occurring in the 1940s (+51.2%). After declines in the 1970s and 1980s, the population reversed trend and has slowly increased in the last three decades. Despite the recent increase, the population in 2020 is still below the peak population of 9,566 in 1970. In the most recent decade, there was a gain of 250 persons.

Population projections for 2030 and 2040 were prepared by the North Jersey Transportation Planning Authority ("NJTPA"). As the projections were based off of the 2010 Census, the NJTPA needs to revise its projections now that the 2020 Census results are available. As it currently stands, the forecast projects the population to be 9,569 in 2040, which would be a 3.9% increase from the 2020 Census and a gain of 357 persons.

2. Chatham Township

Chatham Township, which is also located in Morris County, contains a land area of 8.98 square miles, with an additional 0.38 square miles of water area. Historical and projected populations for Chatham Township from 1940-2040 are shown in Table 4 and Figure 1. In 2020, Chatham Township had 10,983 residents, which is 1,223.1 persons per square mile. From 1940-2020, Chatham Township's population more than quintupled, with its greatest gain occurring in the 1950s (+109.9%) when the population more than doubled. In the most recent decade, there was a gain of 531 persons. Chatham Township's population surpassed Chatham Borough's population in 1980.

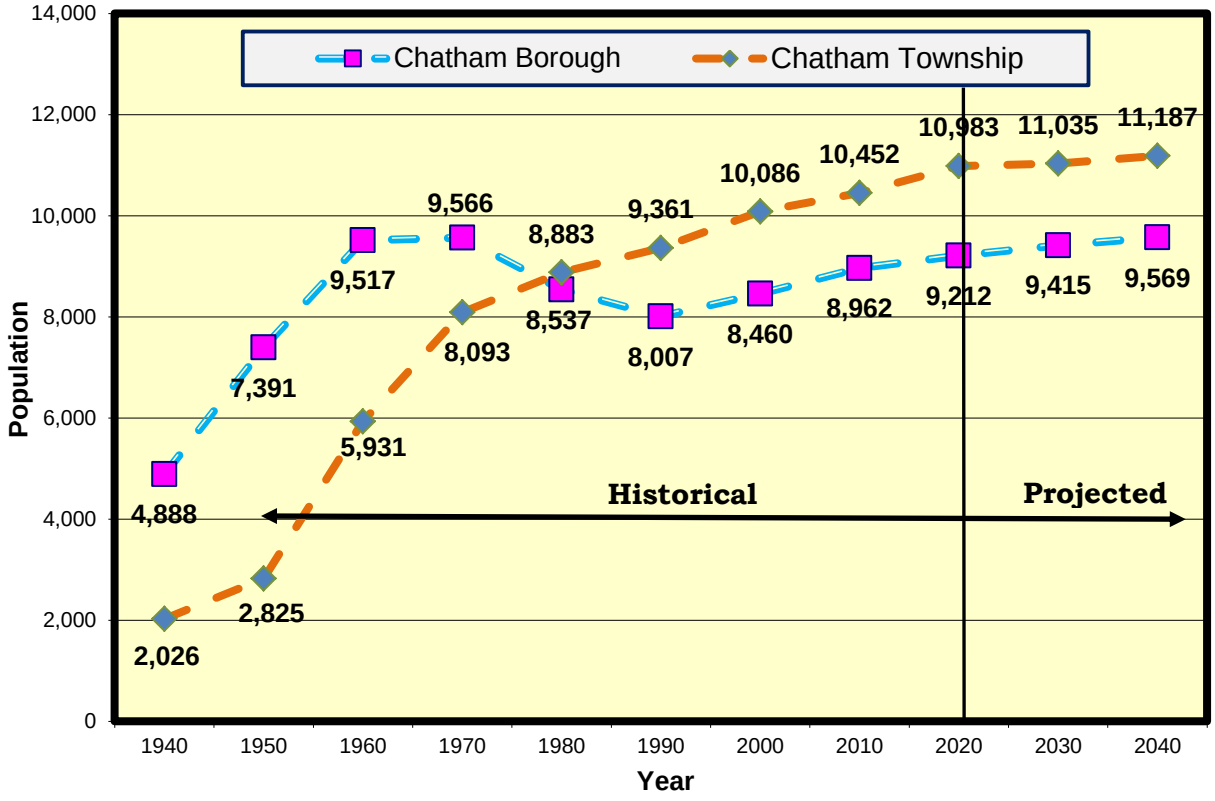
Forecasts prepared by the NJTPA project Chatham Township's population to slowly increase. However, as the projections were based off of the 2010 Census, the NJTPA needs to revise its projections now that the 2020 Census results are available. As it currently stands, the forecast projects the population to be 11,187 in 2040, which would be a 1.9% increase from the 2020 Census and a gain of 204 persons.

Table 4
Historical and Projected Populations for Chatham Township
1940-2040

Year	Population	Percent Change
Historical[1]		
1940	2,026	N/A
1950	2,825	+39.4%
1960	5,931	+109.9%
1970	8,093	+36.5%
1980	8,883	+9.8%
1990	9,361	+5.4%
2000	10,086	+7.7%
2010	10,452	+3.6%
2020	10,983	+5.1%
Projected[2]		
2030	11,035	+0.5%
2040	11,187	+1.4%

Sources: [1]United States Census Bureau
[2]North Jersey Transportation Planning Authority, Inc. (2017)

Figure 1
Historical and Projected Populations
1940-2040



Demographic Profiles

In Table 5, selected demographic characteristics of Chatham Borough and Chatham Township are compared from the 2010 and 2020 Censuses and the 2006-2010 and 2016-2020 American Community Surveys ("ACS"). At the time of this writing, a limited amount of demographic data was available from the 2020 Census, which was limited to total population counts and racial distributions from the Redistricting Data, which is used by states to redraw electoral district boundaries based on where populations have increased or decreased. 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 household 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 communities with fewer than 65,000 persons such as Chatham Borough and Chatham Township, ACS data represent a sample collected over a five-year time period, where the estimates represent the average characteristics between January 2016 and December 2020, for example. 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 2016 to 2020, 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.

1. Chatham Borough

While Whites are the largest race in Chatham Borough, their population is declining. In the 2020 Census, Chatham Borough was 77.7% White as compared to 87.3% in 2010, which is a loss of 9.6 percentage points. Asians were the second-largest race at 9.2% in 2020, which is a gain of 4.4 percentage points from the 2010 percentage (4.8%). Hispanics were the third-largest race, consisting of 7.3% of the population in 2020, which is a gain of 2.2 percentage points from the 2010 percentage of 5.1%.

Regarding nativity, 14.2% of Chatham Borough residents were foreign-born in the 2016-2020 ACS, which is an increase of 4.5 percentage points from the 2006-2010 ACS percentage (9.7%). As a point of comparison, New Jersey's foreign-born resident percentage was 22.7% in the 2016-2020 ACS, which is greater than that of Chatham Borough. While not shown in the table, place of birth, which serves as a proxy for country of origin, indicates that Costa Rica and India were the largest sources of immigrants in the 2006-2010 ACS, accounting for 14.2% and 10.7%, respectively, of the foreign-born population. In the 2016-2020 ACS, China is now the largest source (19.2%) of the foreign-born population while India remains the second-largest source (16.0%).

The median age in Chatham Borough increased from 38.0 years in 2010 to 40.9 years in the 2016-2020 ACS, which is similar to the median age in New Jersey (40.0 years). During the same time period, the percentage of people under the age of 18 years, which corresponds predominantly to school-age children, decreased from 33.5% to 32.0%.

Table 5
Selected Demographic Characteristics

	Chatham Borough		Chatham Township	
Race Origin[1]	**2006-2010 ACS 2010 Census**	**2016-2020 ACS 2020 Census**	**2006-2010 ACS 2010 Census**	**2016-2020 ACS 2020 Census**
White	7,825 (87.3%)	7,159 (77.7%)	9,197 (88.0%)	8,549 (77.8%)
Black or African American	85 (0.9%)	89 (1.0%)	69 (0.7%)	81 (0.7%)
Hispanic	457 (5.1%)	675 (7.3%)	349 (3.3%)	514 (4.7%)
American Indian and Alaska Native	14 (0.2%)	0 (0.0%)	6 (0.1%)	4 (0.0%)
Asian	433 (4.8%)	847 (9.2%)	657 (6.3%)	1,387 (12.6%)
Native Hawaiian and Other Pacific Islander	0 (0.0%)	0 (0.0%)	1 (0.0%)	0 (0.0%)
Other Race	17 (0.2%)	52 (0.6%)	13 (0.1%)	57 (0.5%)
Two or more Races	131 (1.5%)	390 (4.2%)	160 (1.5%)	391 (3.6%)
Place of Birth				
Foreign-Born	9.7%	14.2%	13.4%	15.4%
Age				
Under 18	33.5%	32.0%	28.9%	29.2%
18-64	56.3%	56.8%	56.0%	55.3%
65 and over	10.2%	11.2%	15.1%	15.5%
Median age	38.0 years	40.9 years	43.3 years	41.5 years
Educational Attainment				
Bachelor's degree or higher	76.6%	78.7%	72.0%	80.5%
Graduate or professional degree	34.5%	38.7%	33.4%	40.7%
Income				
Median household income	$143,281	$201,923	$127,679	$202,000
% of Persons in Poverty aged 5-17	0.5%	0.0%	3.8%	0.0%
Housing Units				
Total number	3,210	3,028	4,128	3,761
Occupied units	3,073 (95.7%)	2,856 (94.3%)	3,915 (94.8%)	3,536 (94.0%)
Owner-occupied units	2,438 (79.3%)	2,360 (82.6%)	3,205 (81.9%)	3,036 (85.9%)
Renter-occupied units	635 (20.7%)	496 (17.4%)	710 (18.1%)	500 (14.1%)
Median value of an owner-occupied unit	$699,100	$807,900	$739,500	$927,800
Average household size	2.91	3.03	2.64	2.85
Housing Type[1]				
Total number	3,119	3,028	4,228	3,761
1-unit, attached or detached	2,417 (77.5%)	2,482 (82.0%)	3,073 (72.7%)	2,949 (78.4%)
Two units	206 (6.6%)	77 (2.5%)	53 (1.3%)	39 (1.0%)
Three or four units	178 (5.7%)	172 (5.7%)	39 (0.9%)	124 (3.3%)
Five to nine units	111 (3.6%)	123 (4.1%)	607 (14.4%)	291 (7.7%)
10 to 19 units	36 (1.2%)	0 (0.0%)	264 (6.2%)	154 (4.1%)
20 or more units	171 (5.5%)	174 (5.7%)	192 (4.5%)	204 (5.4%)
Mobile home, Boat, Van, RV, etc.	0 (0.0%)	0 (0.0%)	0 (0.0%)	0 (0.0%)

Sources: American Community Survey (2006-2010 and 2016-2020) and United States Census (2010 and 2020)
Notes: [1]Data may not sum to 100.0% due to rounding.
Cells shaded orange are from the decennial Census while cells shaded blue are from the American Community Survey.

Regarding educational attainment for adults aged 25 and over, 78.7% of the population had a bachelor's degree or higher in the 2016-2020 ACS as compared to 76.6% in the 2006-2010 ACS, which is a gain of 2.1 percentage points. Chatham Borough is a highly-educated population, as its percentage of persons having a bachelor's degree or higher is much greater than that of New Jersey (40.7%). Persons with graduate or professional degrees increased from 34.5% to 38.7% during this time period, a 4.2 percentage-point gain.

Median household income increased from $143,281 in the 2006-2010 ACS to $201,923 in the 2016-2020 ACS, a gain of 40.9%. By comparison, median household income in New Jersey is $85,245, which is less than half of Chatham Borough's. During this time period, the percentage of school-age children (5-17) that are in poverty declined from 0.5% to 0.0%.

Regarding housing, there were 3,028 housing units in Chatham Borough in the 2016-2020 ACS, which is a loss of 182 housing units (-5.7%) from 2010. Over this time period, the overall occupancy rate declined slightly from 95.7% to 94.3%, while the average household size increased from 2.91 to 3.03 persons. Renter-occupied units accounted for 17.4% of the housing units in the 2016-2020 ACS, which is a loss of 3.3 percentage points from the 2010 percentage (20.7%). As a point of comparison, the percentage of renter-occupied units in Chatham Borough is much lower than that of New Jersey (36.0%). Finally, the median home price of an owner-occupied unit in the 2016-2020 ACS was $807,900, which is a 15.6% increase from the value reported in the 2006-2010 ACS ($699,100).

With respect to housing type, 82.0% of homes in the 2016-2020 ACS were one-unit, either attached or detached, which is a gain of 4.5 percentage points from the 2006-2010 ACS percentage (77.5%). Housing with 3-4 units and 20 or more units, which contain renters, were the second-largest type of housing (tie) in the 2016-2020 ACS, consisting of 5.7% of the housing stock. In general, there has been little change in the housing distribution since the 2006-2010 ACS.

2. Chatham Township

In Chatham Township, while Whites are the largest race, their population is also declining. In 2020, Chatham Township was 77.8% White as compared to 88.0% in 2010, which is a loss of 10.2 percentage points. Asians were the second-largest race at 12.6% in 2020, which is double the 2010 percentage (6.3%). Hispanics were the third-largest race, consisting of 4.7% of the population in 2020, which is a gain of 1.4 percentage points from the 2010 percentage of 3.3%.

Regarding nativity, 15.4% of Chatham Township residents were foreign-born in the 2016-2020 ACS, which is a gain of 2.0 percentage points from the 2006-2010 ACS percentage (13.4%). While the foreign-born percentage in Chatham Township is slightly higher than that of Chatham Borough (14.2%), it is lower than that of New Jersey (22.7%). While not shown in the table, place of birth, which serves as a proxy for country of origin, indicates that China and United Kingdom/Canada were the largest sources of immigrants in the 2006-2010 ACS, accounting for 11.8% and 10.1%, respectively, of the foreign-born population. While China continues to be the largest source according to the 2016-2020 ACS, it accounts for a larger share (16.2%) of the foreign-born population. India is now the second-largest source (16.0%).

The median age in Chatham Township declined from 43.3 years in 2010 to 41.5 years in the 2016-2020 ACS, which is slightly higher than the median age in New Jersey (40.0 years). During the same time period, the percentage of people under the age of 18 years, which corresponds predominantly to school-age children, remained nearly unchanged (29.2% in the 2016-2020 ACS).

Regarding educational attainment for adults aged 25 and over, 80.5% of the population had a bachelor's degree or higher in the 2016-2020 ACS as compared to 72.0% in the 2006-2010 ACS, which is a gain of 8.5 percentage points. While Chatham Township's percentage of persons having a bachelor's degree or higher is nearly double that of New Jersey (40.7%), it is similar to Chatham Borough's (78.7%). The percentage of persons with graduate or professional degrees was 40.7% in the 2016-2020 ACS, which is a 7.3 percentage-point gain from the 2006-2010 ACS percentage (33.4%).

Median household income increased from $127,679 in the 2006-2010 ACS to $202,000 in the 2016-2020 ACS, a gain of 58.2%. By comparison, median household income in New Jersey is $85,245, which is less than half that of Chatham Township. Median household income in Chatham Township is nearly identical to that of Chatham Borough ($201,923). During this time period, the percentage of school-age children (5-17) that are in poverty decreased from 3.8% to 0.0%.

Regarding housing, there were 3,761 housing units in Chatham Township in the 2016-2020 ACS, which is a loss of 367 units (-8.9%) from 2010. Over this time period, the occupancy rate remained nearly unchanged (94.0% in the 2016-2020 ACS), while the average household size increased from 2.64 to 2.85 persons. Renter-occupied units accounted for 14.1% of the occupied units in the 2016-2020 ACS, which is a loss of 4.0 percentage points from the 2010 percentage (18.1%). While the percentage of renter-occupied units in Chatham Township is slightly lower than Chatham Borough (17.4%), it is significantly lower than New Jersey (36.0%). The median home price of an owner-occupied unit in the 2016-2020 ACS was $927,800, which is a 25.5% gain from the value reported in the 2006-2010 ACS ($739,500). The median home price of an owner-occupied unit in Chatham Township is approximately $120,000 higher than in Chatham Borough.

With respect to housing type, 78.4% of homes in the 2016-2020 ACS were one-unit, either attached or detached, which is a 5.7 percentage-point gain from the 2006-2010 ACS percentage of 72.7%. The percentage of one-unit homes is slightly higher in Chatham Borough (82.0%) as compared to Chatham Township. Housing with 5-9 units, which contain renters, was the second-largest type of housing in the 2016-2020 ACS and consisted of 7.7% of the housing stock. Over this time period, the largest percentage-point change (-6.7) also occurred in housing with 5-9 units.

Demographic Overview Maps

The following section utilizes 2016-2020 ACS data at the Census block group level to pictorially represent specific demographic characteristics of Chatham Borough and Chatham Township.

Figures 2-4 show the White, Asian, and Hispanic percentages in the two communities, which are the three largest races in Chatham Borough and Chatham Township. In addition, the elementary attendance areas are shown to provide context of where the highest and lowest percentages are occurring. The White percentage is greatest in the central and eastern sections of Chatham Township and the central and eastern sections of Chatham Borough, which is located in each of the three elementary attendance areas. The Asian percentage is greatest in the southern section of Chatham Township in the Southern Boulevard elementary attendance area. The Hispanic percentage is greatest in the southern and northern sections of Chatham Borough in the Washington Avenue and Milton Avenue elementary attendance areas.

Figures 5 and 6 show the percentage of foreign-born persons and the percentage of persons speaking English less than "Very Well", which may potentially correlate with English as a New Language ("ENL") students in need of English language development instruction. The foreign-born percentage is greatest in the southern section of Chatham Borough in the Washington Avenue elementary attendance area and the southern section of Chatham Township in the Southern Boulevard elementary attendance area. The percentage of persons speaking English less than "Very Well" is greatest in the central section of Chatham Borough in the Milton Avenue elementary attendance area.

Figure 7 shows the percentage of school-age children (5-17). The greatest percentages of school-age children are in the central section of Chatham Township and the central and northern sections of Chatham Borough, which are located in each of the three elementary attendance areas.

Figure 8 shows the percentage of persons living in poverty. While the percentages are very small, the percentage of persons living in poverty is greatest in the southern section of Chatham Township in the Southern Boulevard elementary attendance area.

Figure 2
School District of the Chathams - White Percentage

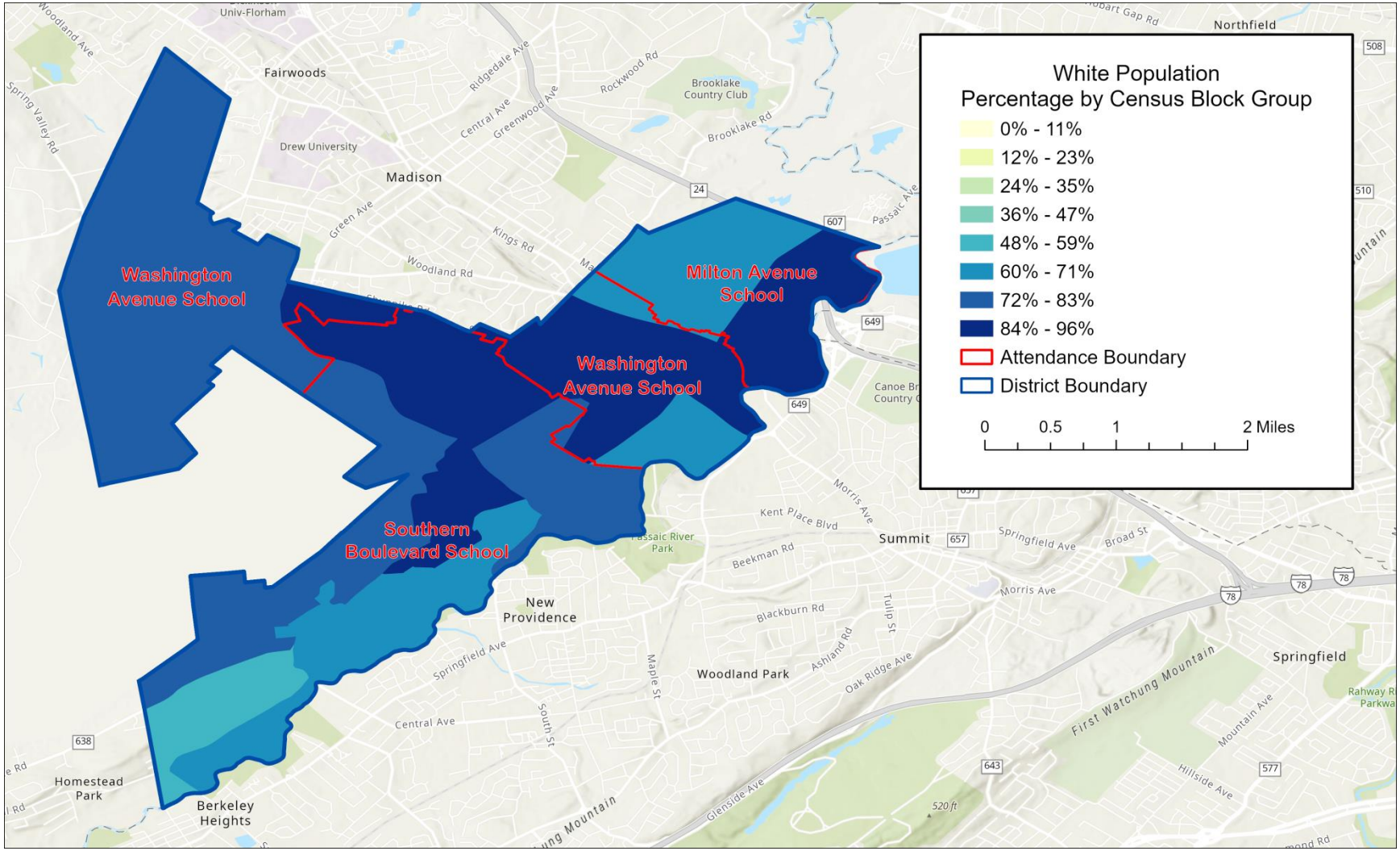


Figure 3
School District of the Chathams - Asian Percentage

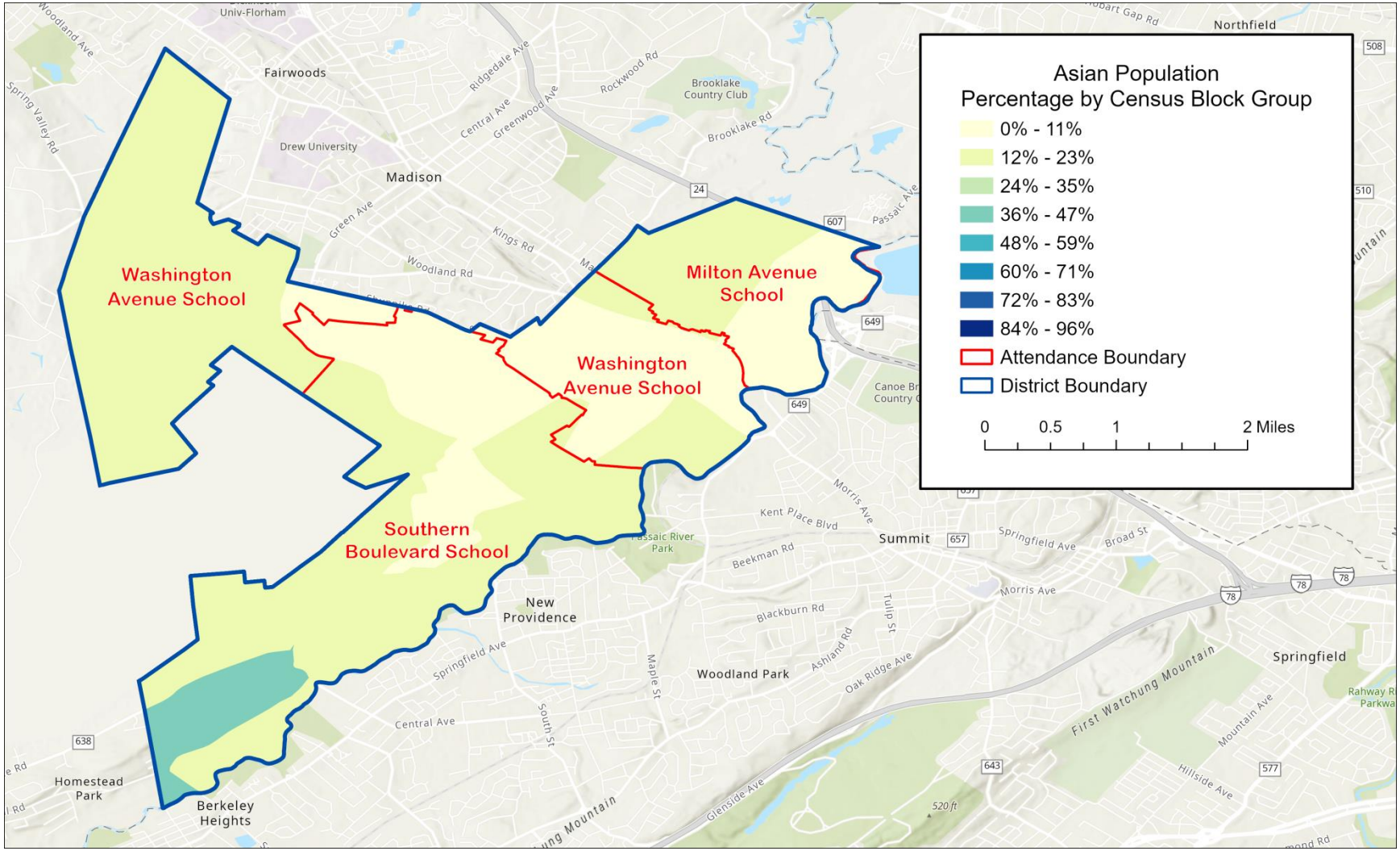


Figure 4
School District of the Chathams - Hispanic Percentage

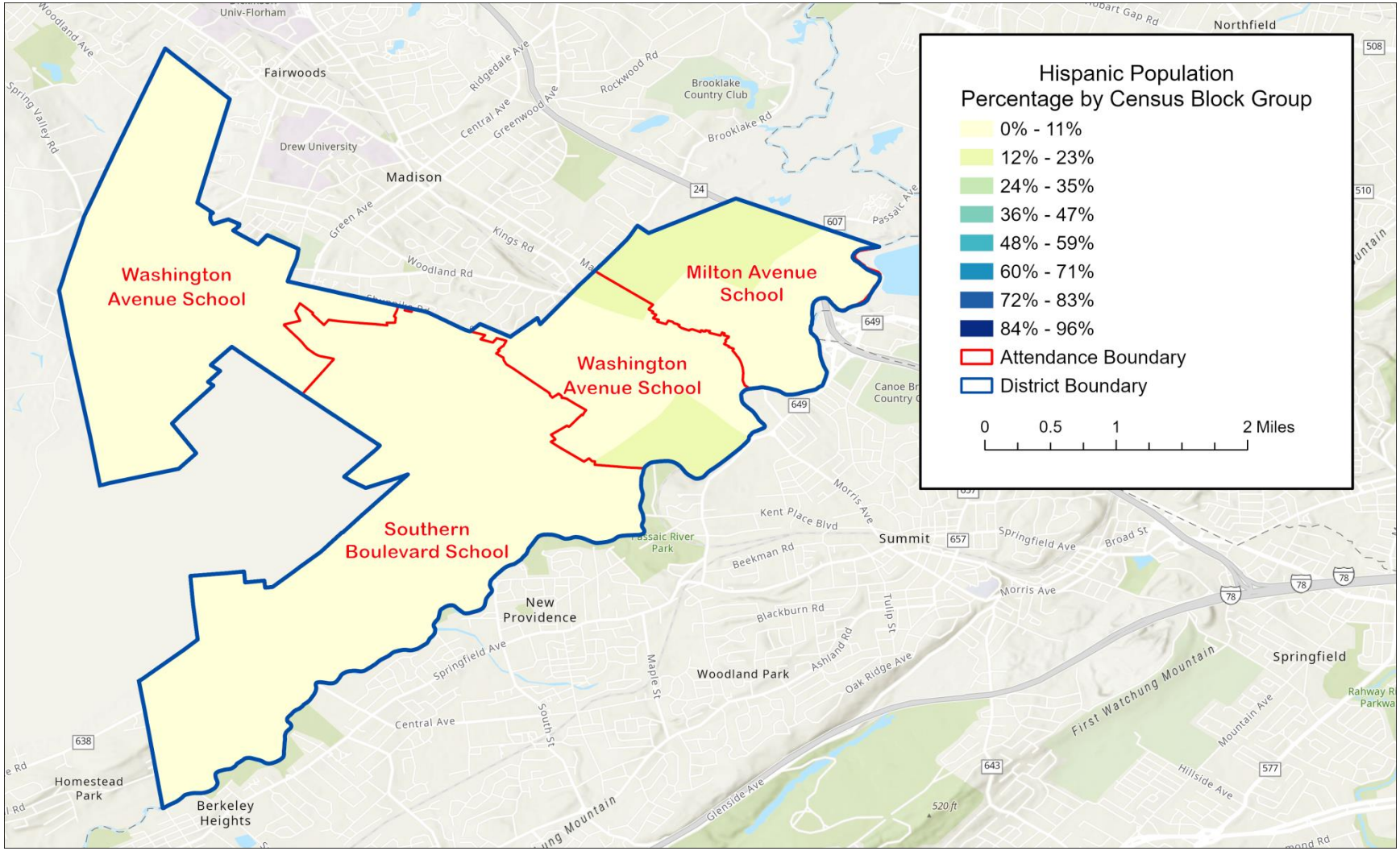


Figure 5
School District of the Chathams - Foreign-Born Percentage

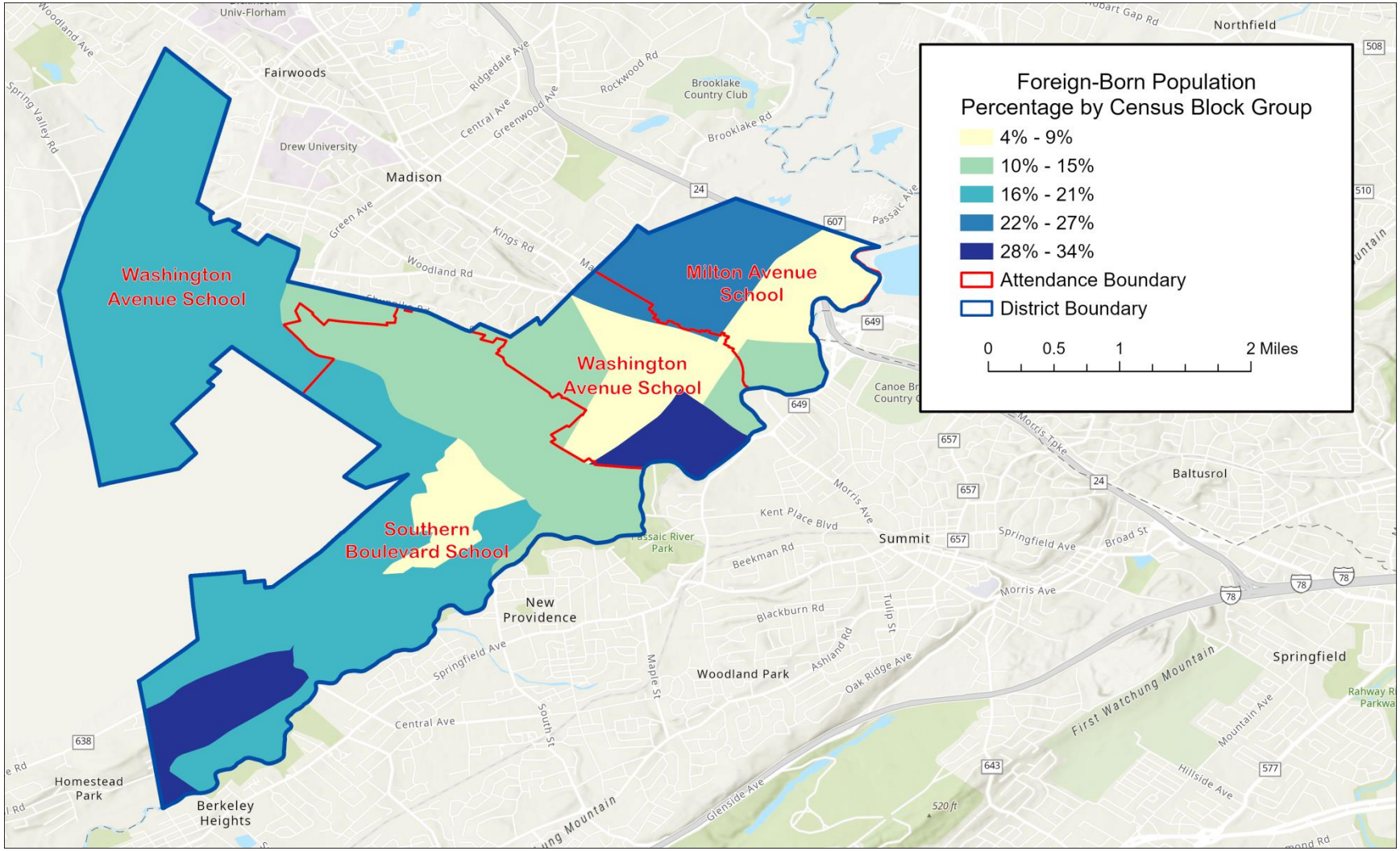


Figure 6
School District of the Chathams - Percentage of Persons Speaking English Less than "Very Well"

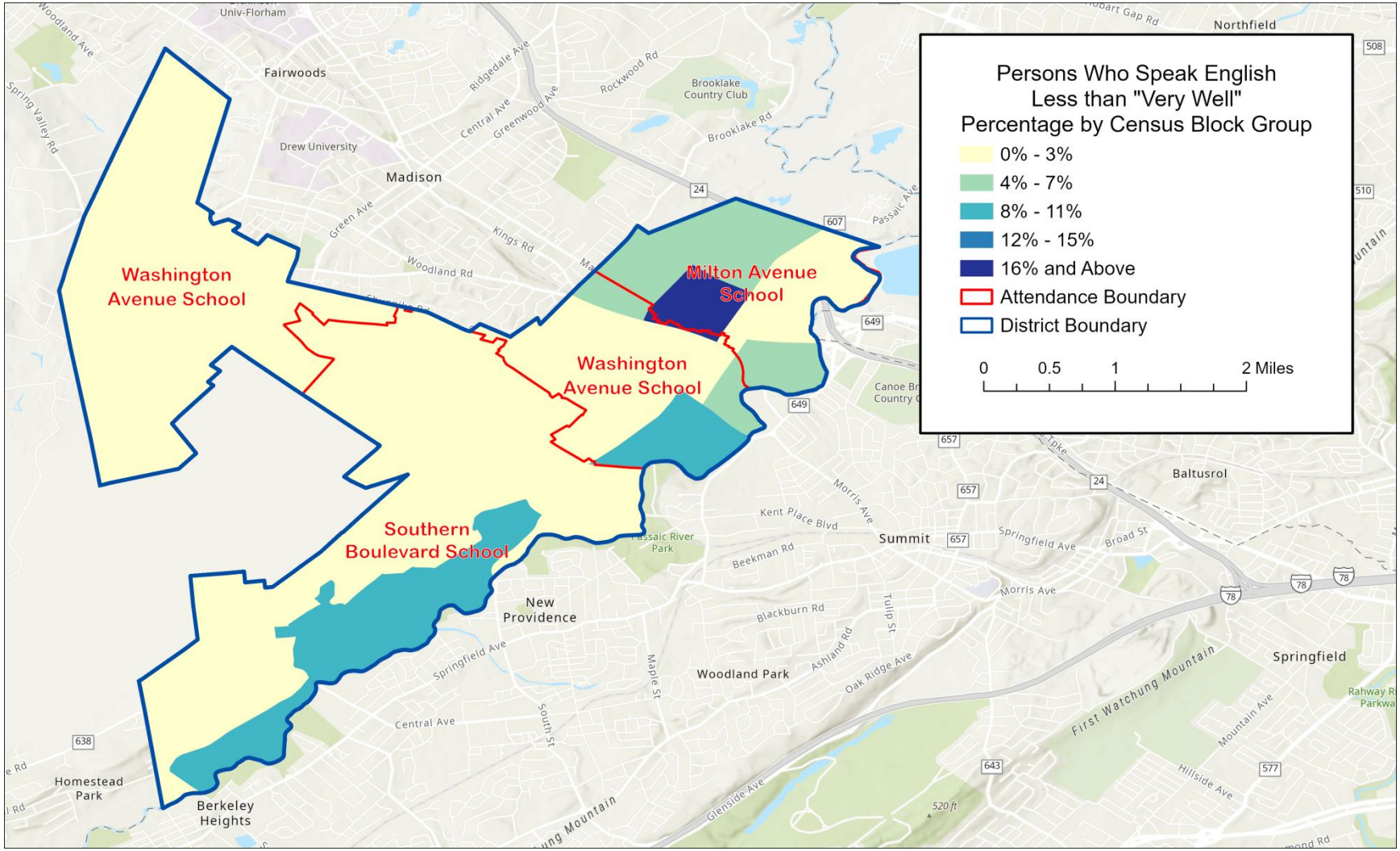


Figure 7
School District of the Chathams - School-Age Population (5-17) Percentage

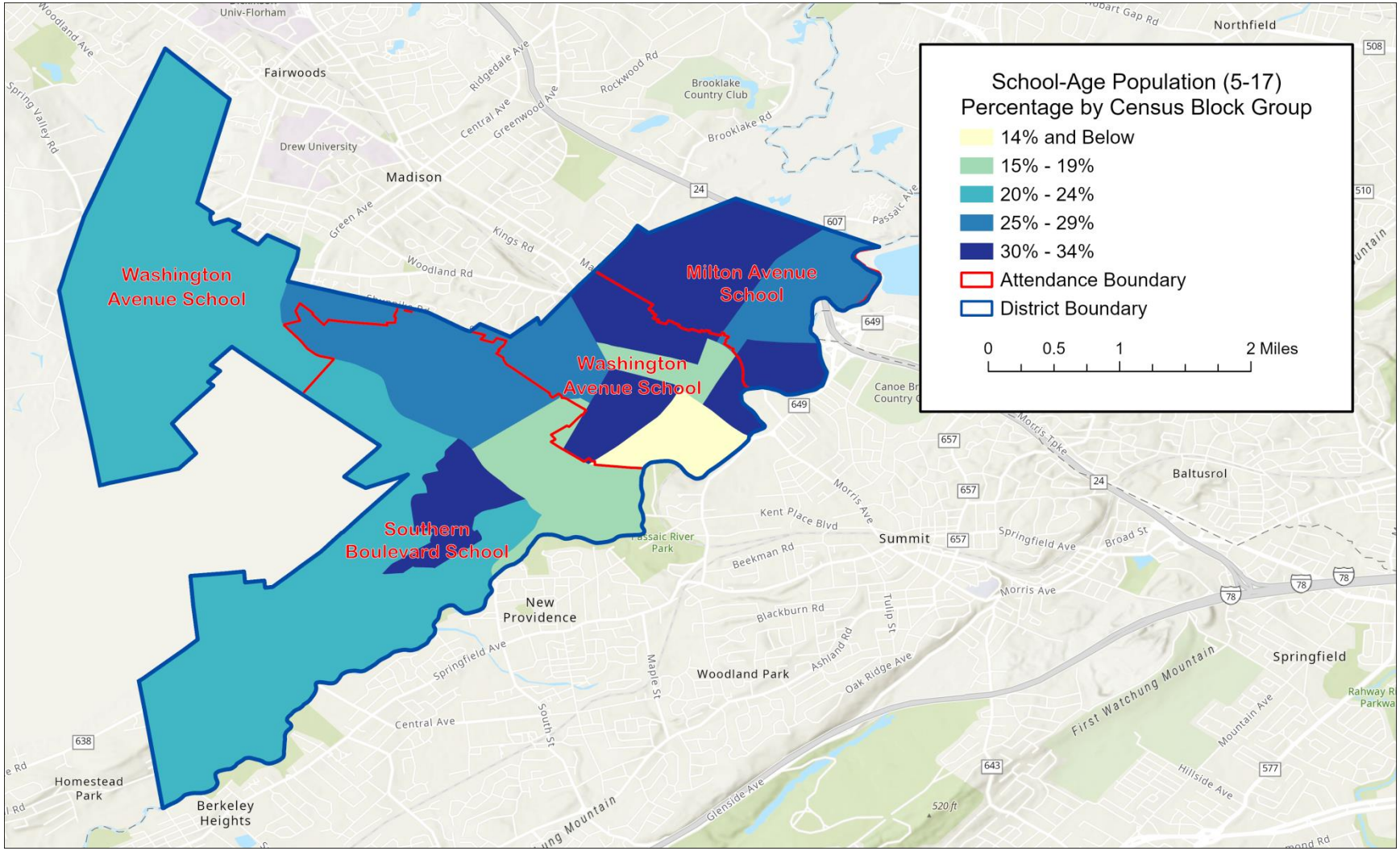
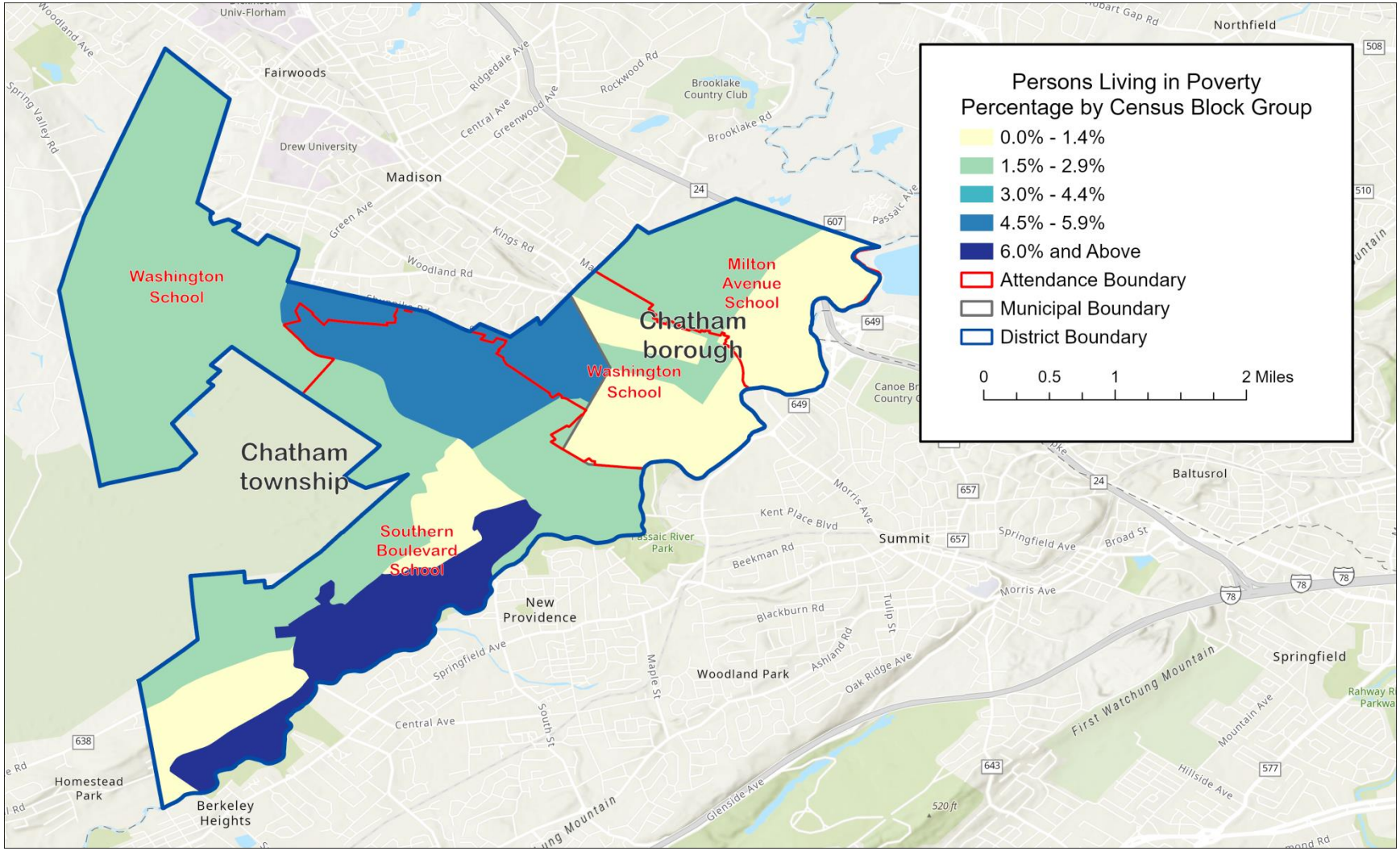


Figure 8
School District of the Chathams - Percentage of Persons Living in Poverty



District Overview

The School District of the Chathams has six schools that serve grades pre-kindergarten through twelve. In Figure 9, the location of each of the district's schools is shown with respect to the municipal boundaries. For grades PK-3, children attend Milton Avenue School ("Milton Avenue"), Southern Boulevard School ("Southern Boulevard"), or Washington Avenue School ("Washington Avenue") before advancing to Lafayette School ("Lafayette") for grades four and five. Children in grades 6-8 are educated in Chatham Middle School while Chatham High School educates students in grades 9-12. Figure 10 shows only the elementary schools (PK-3) and their respective attendance areas. It should be noted that the western section of Chatham Township in Figure 10 contains the Great Swamp National Wildlife Refuge and therefore is not included in an attendance area.

According to the district's Long Range Facility Plan ("LRFP"), total functional capacity in the district is 4,127 students. Functional capacity is the adjusted square footage of a school building divided by the minimum area allowance per Full-time Equivalent student for the grade level contained therein. A comparison of each school's capacity to current and projected enrollments is provided later in the report.

In this study, historical enrollments from the New Jersey Department of Education ("NJDOE") New Jersey Standards Measurement and Resource for Teaching ("NJ SMART") database were used to project enrollments five years into the future using the Cohort-Survival Ratio method.

Figure 9
School Locations – School District of the Chathams

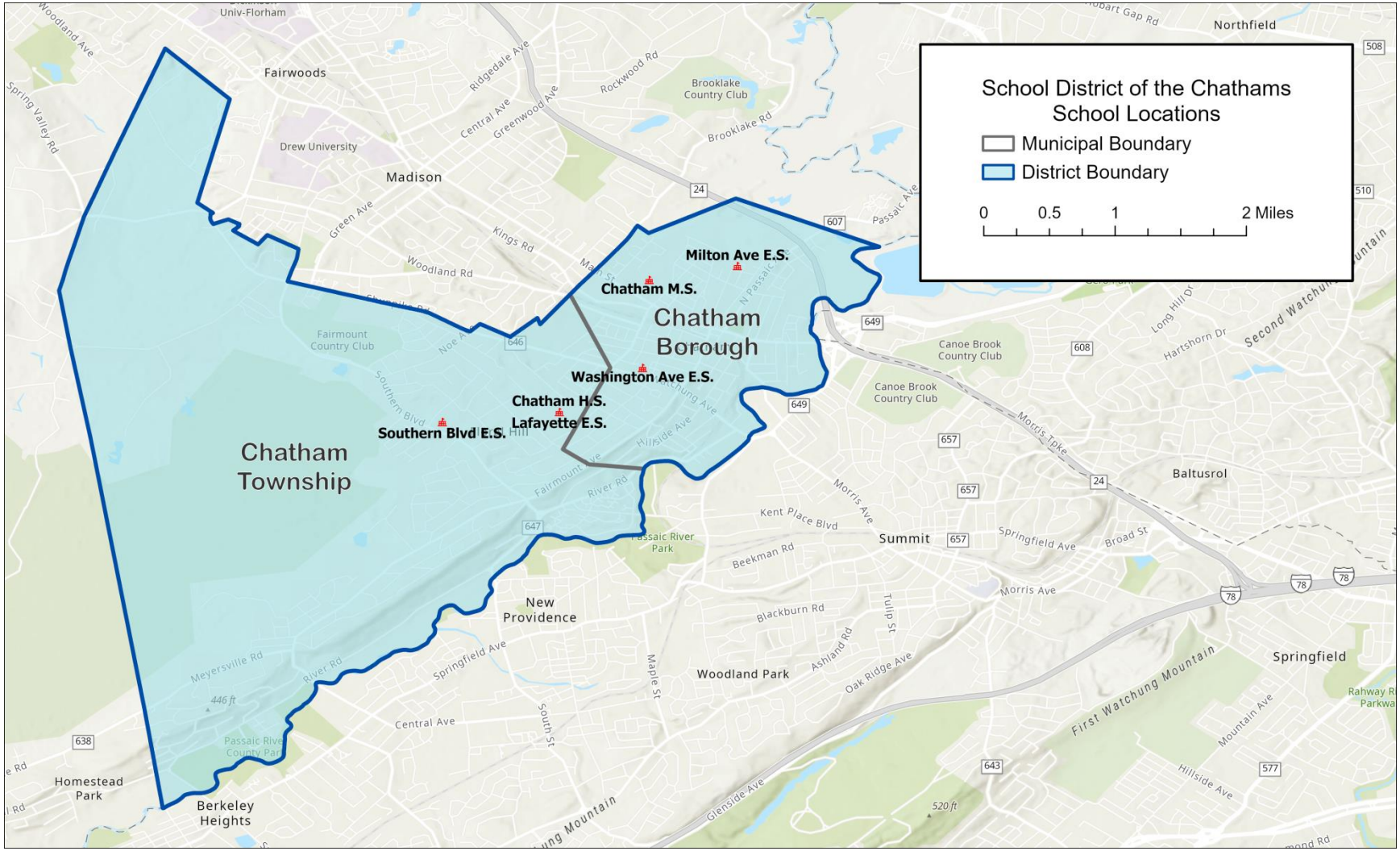
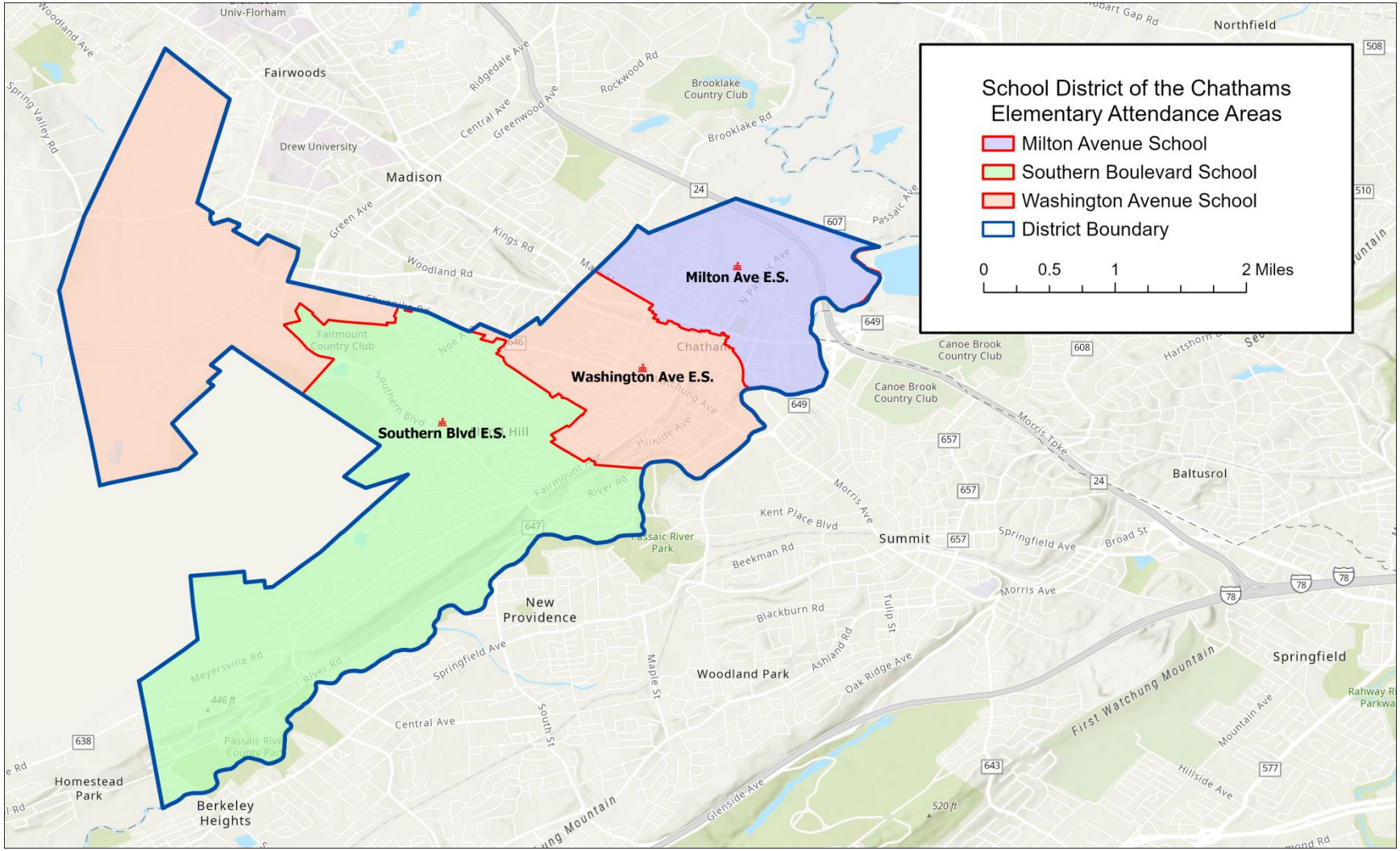


Figure 10
Elementary School Attendance Areas – School District of the Chathams



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 1.00 indicates stable enrollment, less than 1.00 indicates declining enrollment and outward migration, while greater than 1.00 indicates increasing enrollment and inward migration. If, for example, a school district had 100 fourth graders and the next year 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 trends without any major unpredictable fluctuations from year to year. In school districts encountering rapid growth or decline 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-level enrollments five years into the future.

Historical Enrollment Trends

Historical enrollments for the School District of the Chathams from 2012-13 through 2021-22, a ten-year period, are shown in Figure 11 and Table 6. Enrollments slowly increased through 2016-17 before reversing trend. Enrollments have declined annually for the last five years. In the last two years, there has been a decline of 309 students, which is likely related to the coronavirus pandemic. In 2021-22, enrollment is 3,732, which represents a decline of 378 students (-9.2%) from the 2012-13 enrollment of 4,110.

Figure 11
School District of the Chathams Historical Enrollments
2012-13 to 2021-22

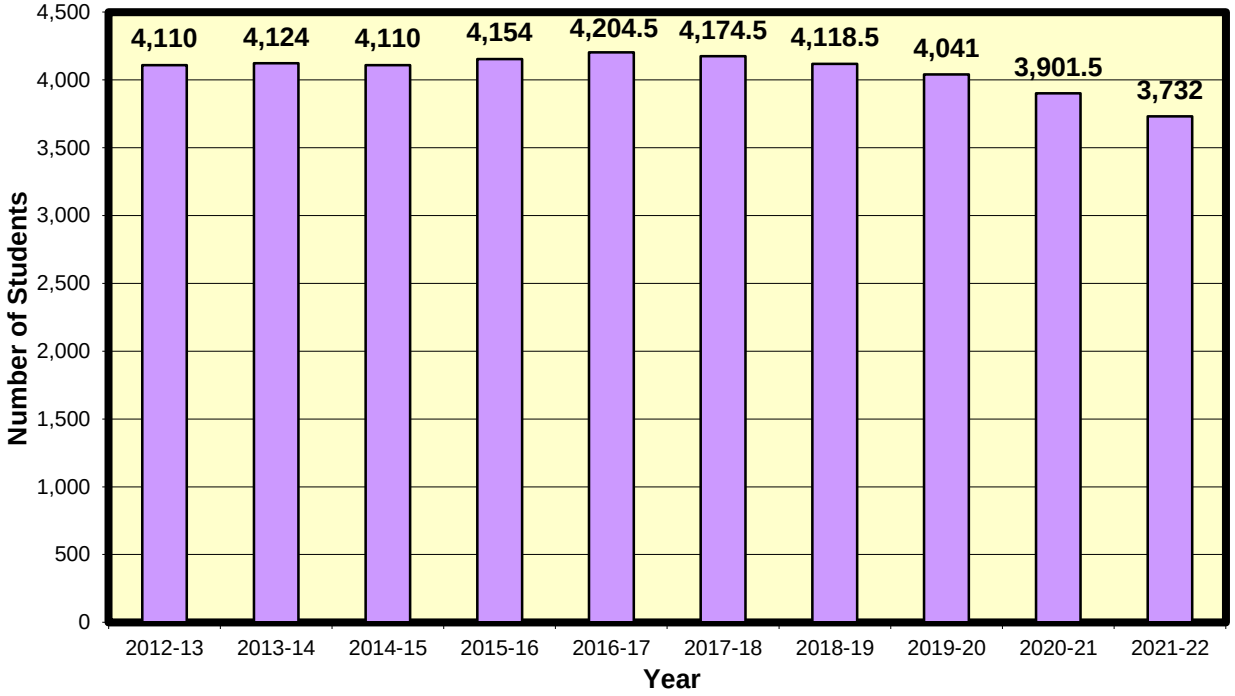


Table 7 shows computed grade-by-grade survival ratios from 2012-13 to 2021-22. In addition, the average, minimum, and maximum survival ratios are shown for the past ten years along with the five-year averages, which were used to project enrollments. The average survival ratios also indicate the net migration by grade, where values over 1.000 reflect net inward migration and values below 1.000 reflect net outward migration. Eight of the 13 average survival ratios in the five-year trend were below 1.000, indicating a slight net outward migration of students. Of the five average survival ratios that were above 1.000, three were in the lower elementary grades (K-2). In 2020-21, which represents the first year of the coronavirus pandemic, three survival ratios were the lowest value in the last decade (two of which were in the middle school grades) and are bolded in the table. The decline in the ratios is likely due to the pandemic, as parents sought alternative educational experiences for their children, or may have had to relocate. In comparing the five-year averages with the ten-year averages, the differences were very small, demonstrating the long-term stability of the survival ratios over the last decade, although 8 of 13 differences were negative, indicating a decline in the ratios in the short term.

Table 6
School District of the Chathams Historical Enrollments
2012-13 to 2021-22

Year[1]	PK[2]	K	1	2	3	SE[3]	PK-3 Total	4	5	SE[4]	4-5 Total	6	7	8	SE[5]	6-8 Total	9	10	11	12	SE[6]	9-12 Total	PK-12 Total
2012-13	51	264	307	313	333	28	**1,296**	366	329	0	**695**	311	307	343	0	**961**	298	291	288.5	280.5	0	**1,158**	**4,110**
2013-14	22	234	338	310	321	47	**1,272**	350	356	2	**708**	335	306	301	0	**942**	337	290	286.5	288.5	0	**1,202**	**4,124**
2014-15	21	237	284	346	315	47	**1,250**	320	355	5	**680**	363	326	302	0	**991**	291	331	285.5	281.5	0	**1,189**	**4,110**
2015-16	51	203	306	294	362	32	**1,248**	313	330	9	**652**	358	367	325	4	**1,054**	296	297	324.5	282.5	0	**1,200**	**4,154**
2016-17	45	202	284	318	307	32	**1,188**	351	321	19	**691**	345	361	375	5	**1,086**	317	299	300	322.5	1	**1,239.5**	**4,204.5**
2017-18	36	201	276	284	339	31	**1,167**	316	365	15	**696**	320	349	365	4	**1,038**	360	318	301	294.5	0	**1,273.5**	**4,174.5**
2018-19	43	182	268	279	294	25	**1,091**	348	321	10	**679**	359	319	348	11	**1,037**	333	362	311.5	300	5	**1,311.5**	**4,118.5**
2019-20	28	158	247	286	279	46	**1,044**	291	353	15	**659**	319	349	317	10	**995**	339	325	361.5	312.5	5	**1,343**	**4,041**
2020-21	45	177	218	257	274	41	**1,012**	280	289	23	**592**	331	307	329	17	**984**	293	334	324.5	358	4	**1,313.5**	**3,901.5**
2021-22	56	179	226	226	249	37	**973**	280	272	23	**575**	287	318	300	15	**920**	306	292	331.5	329.5	5	**1,264**	**3,732**

Notes: [1]Data were provided by the New Jersey Department of Education (http://www.nj.gov/education/data/enr/).
[2]Pre-kindergarten regular education enrollment
[3]Self-contained special education enrollment/ungraded students at the lower elementary school level
[4]Self-contained special education enrollment/ungraded students at the upper elementary school level
[5]Self-contained special education enrollment/ungraded students at the middle school level
[6]Self-contained special education enrollment/ungraded students at the high school level

Table 7
School District of the Chathams Historical Survival Ratios
2012-13 to 2021-22

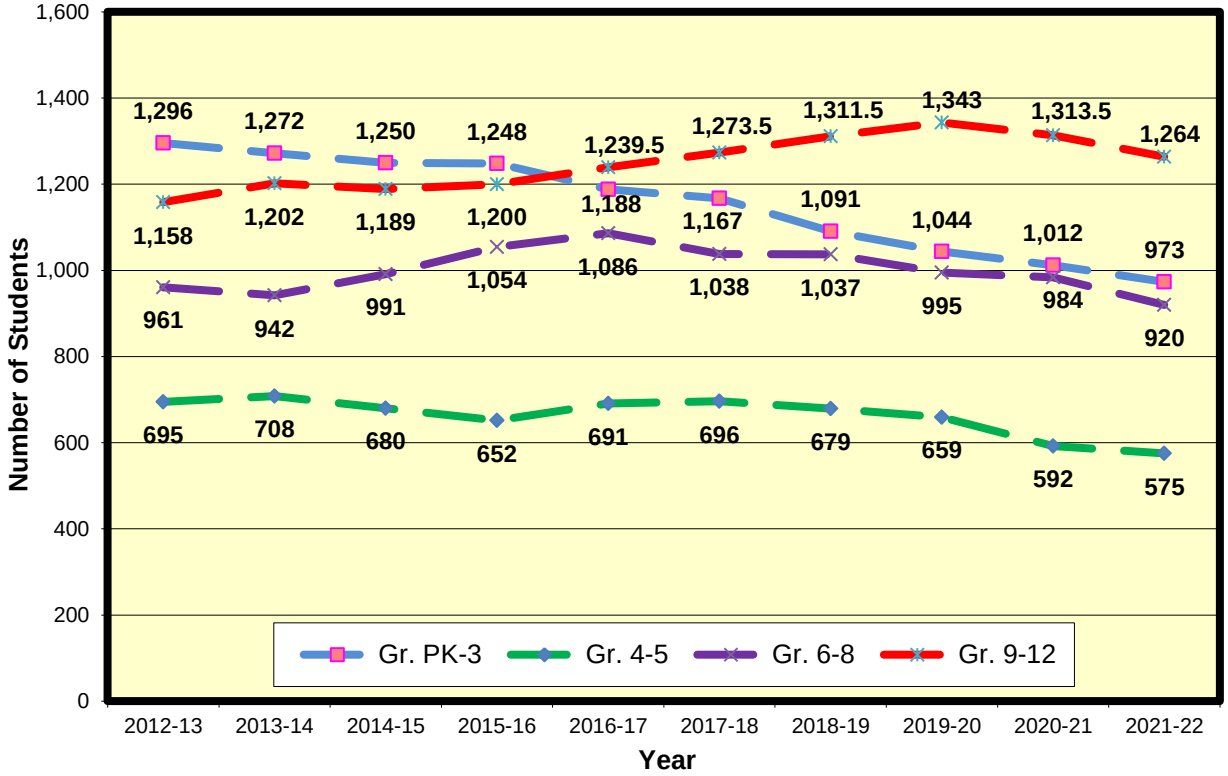
Progression Years	B-K	K-1	1-2	2-3	3-4	4-5	5-6	6-7	7-8	8-9	9-10	10-11	11-12
2012-13 to 2013-14	0.8966	1.2803	1.0098	1.0256	1.0511	0.9727	1.0182	0.9839	0.9805	0.9825	0.9732	0.9845	1.0000
2013-14 to 2014-15	1.1505	1.2137	1.0237	1.0161	0.9969	1.0143	1.0197	0.9731	0.9869	0.9668	0.9822	0.9845	0.9825
2014-15 to 2015-16	1.0050	1.2911	1.0352	1.0462	0.9937	1.0313	1.0085	1.0110	0.9969	0.9801	1.0206	0.9804	0.9895
2015-16 to 2016-17	1.1285	1.3990	1.0392	1.0442	0.9696	1.0256	1.0455	1.0084	1.0218	0.9754	1.0101	1.0101	0.9938
2016-17 to 2017-18	1.2036	1.3663	1.0000	1.0660	1.0293	1.0399	0.9969	1.0116	1.0111	0.9600	1.0032	1.0067	0.9817
2017-18 to 2018-19	1.1304	1.3333	1.0109	1.0352	1.0265	1.0158	0.9836	0.9969	0.9971	0.9123	1.0056	0.9796	0.9967
2018-19 to 2019-20	1.0260	1.3571	1.0672	1.0000	0.9898	1.0144	0.9938	0.9721	0.9937	0.9741	0.9760	0.9986	1.0032
2019-20 to 2020-21	1.0114	1.3797	1.0405	0.9580	1.0036	0.9931	0.9377	0.9624	0.9427	0.9243	0.9853	0.9985	0.9903
2020-21 to 2021-22	1.1474	1.2768	1.0367	0.9689	1.0219	0.9714	0.9931	0.9607	0.9772	0.9301	0.9966	0.9925	1.0154
Maximum Ratio	1.2036	1.3990	1.0672	1.0660	1.0511	1.0399	1.0455	1.0116	1.0218	0.9825	1.0206	1.0101	1.0154
Minimum Ratio	0.8966	1.2137	1.0000	**0.9580**	0.9696	0.9714	**0.9377**	0.9607	**0.9427**	0.9123	0.9732	0.9796	0.9817
Avg. 5-Year Ratios	1.1038	1.3368	1.0388	0.9905	1.0105	0.9987	0.9770	0.9730	0.9777	0.9352	0.9908	0.9923	1.0014
Avg. 10-Year Ratios	1.0777	1.3219	1.0292	1.0178	1.0091	1.0087	0.9996	0.9867	0.9898	0.9562	0.9947	0.9928	0.9948
Diff. Between 5-Year and 10-Year Ratios	+0.0261	+0.0148	+0.0096	-0.0273	+0.0013	-0.0100	-0.0226	-0.0137	-0.0121	-0.0210	-0.0039	-0.0005	+0.0066

Note: Bolded values reflect survival ratios from 2019-20 to 2020-21, which represents the first year of the coronavirus pandemic.

Factors related to inward migration include families with school-age children purchasing an existing home or new housing unit, or renting an apartment. The reasons for families moving into a community vary. For instance, a family could move into Chatham Borough or Chatham Township to be close to work, the presence of affordable housing, or to be near family members. 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, parochial, or charter schools, to be homeschooled, or to attend a different public school district. In the case of the School District of the Chathams, 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.

Historical enrollments are also shown in Table 6 and Figure 12 by grade configuration (PK-3, 4-5, 6-8, and 9-12). Self-contained special education/ungraded students were incorporated into the totals by grade configuration.

Figure 12
School District of the Chathams
Historical Enrollments by Grade Configuration
2012-13 to 2021-22



For grades PK-3, enrollments have declined annually over the last decade. In 2021-22, enrollment is 973, which is a decline of 323 students from the 2012-13 enrollment of 1,296.

For grades 4-5 in Lafayette, enrollments were fairly stable from 2012-13 to 2017-18 before declining in the last four years. Enrollment is 575 in 2021-22, which is a decline of 120 students from the 2012-13 enrollment of 695.

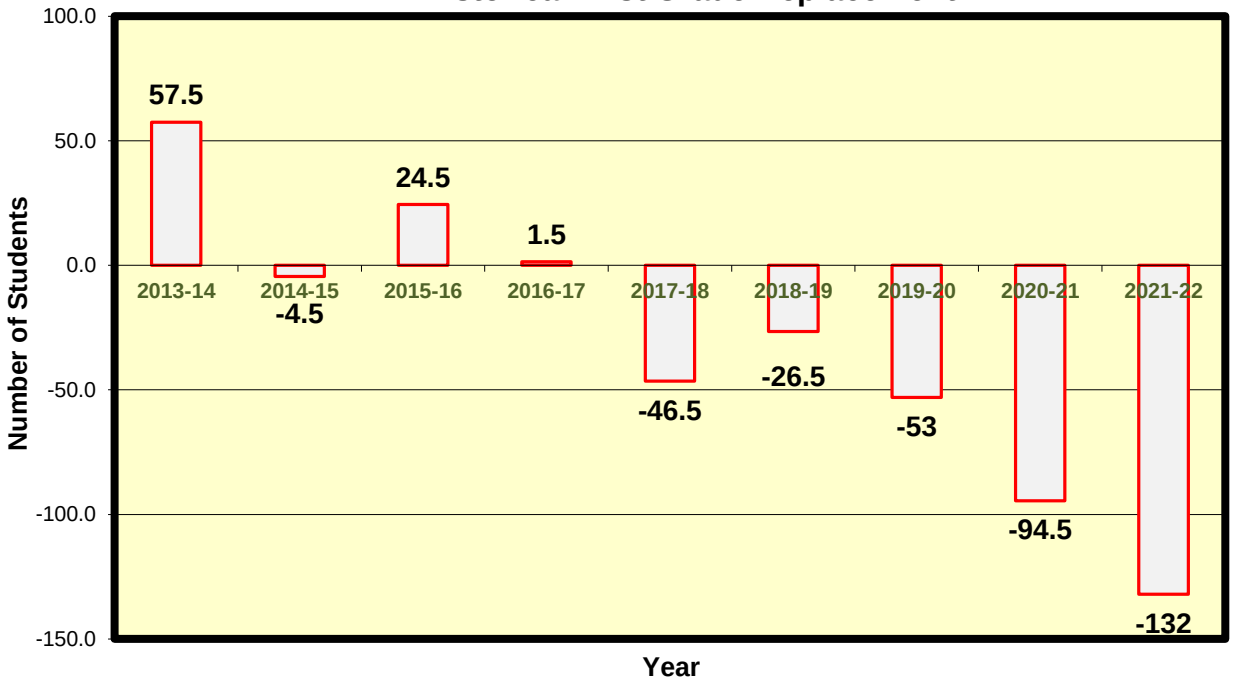
At Chatham Middle School (6-8), enrollments increased through 2016-17 before reversing trend. Enrollments have declined annually for the last five years. In 2021-22, enrollment is 920, which is a decline of 41 students from the 2012-13 enrollment of 961.

At Chatham High School (9-12), enrollments increased through 2019-20 before reversing trend. Enrollment is 1,264 in 2021-22, which represents a gain of 106 students from the 2012-13 enrollment of 1,158.

First Grade Replacement

First grade replacements were analyzed to determine whether there was any relationship between overall enrollment change and first grade replacement, which is the numerical difference between the number of graduating 12th graders and the number of entering first grade students. Typically, the outgoing 12th grade student population is compared to the incoming kindergarten class. However, since the district has a half-day kindergarten program[4], it is more appropriate to compare the twelfth grade student population to the first grade student population, as the district gains a significant number of students from kindergarten to first grade when parents elect to send their children to a full-day kindergarten program elsewhere before enrolling them in the public school district for the first grade. As shown in Figure 13, the district has experienced negative first grade replacement in six of the last nine years, ranging from 4.5-132 students per year, with the magnitude increasing over time. Negative first grade replacement occurs when the number of first grade students entering the district is less than the number of graduating twelfth grade students from the prior year. Conversely, positive first grade replacement occurs when the number of first grade students entering the district is greater than the number of graduating twelfth grade students from the prior year. The change from positive to negative first grade replacement in recent years is due to the decreasing sizes of the entering first grade classes and increasing sizes of the 12th grade classes. In 2021-22, there was a loss of 132 students due to first grade replacement, as 358 twelfth graders graduated in 2020-21 and were replaced by 226 first grade students in 2021-22.

Figure 13
School District of the Chathams
Historical First Grade Replacement

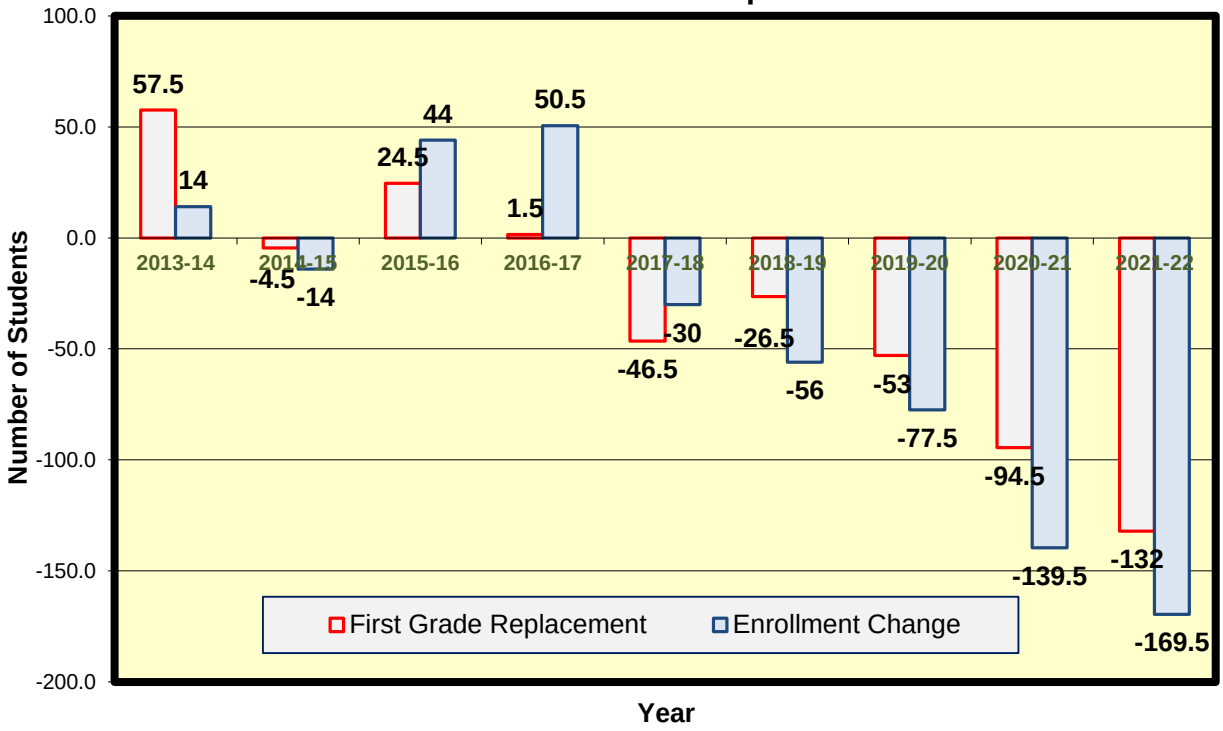


[4] A tuition-based full-day kindergarten program exists in the school district and admits students through a lottery. Approximately 46% of students attended full-day kindergarten in 2021-22.

Figure 14 shows the annual change in total enrollment compared to first grade replacement. As the figure demonstrates, there appears to be a strong relationship, statistically speaking, between the overall change in enrollment and first grade replacement. Although this data represents a small sample, the correlation coefficient between the two variables was +0.915. 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 first grade 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 +0.915, there appears to be a strong relationship between enrollment change and first grade replacement in the school district in the last nine years.

In the last four years, the district's losses due to negative first grade replacement were compounded by the net outward migration of students in the other grades (1 to 2, 2 to 3, etc.), resulting in an even larger enrollment decline. This was confirmed previously as eight (8) of the 13 average survival ratios in the five-year trend were below 1.000.

Figure 14
Comparison of PK-12 Enrollment Change and First Grade 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 2016, there were a total of 156 births in Chatham Borough and Chatham Township. Five years later (the 2021-22 school year), 179 children enrolled in kindergarten, which is equal to a survival ratio of 1.147 from birth to kindergarten. Birth counts and birth-to-kindergarten survival ratios are displayed in Table 8. Values greater than 1.000 indicate that some children are born outside of a school district's attendance 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, charter, 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.

Table 8
Birth Counts and Historical Birth-to-Kindergarten and Birth-to-First Grade Survival Ratios
School District of the Chathams

Birth Year	Chatham Borough Births[1]	Chatham Township Births[1]	Total Number of Births	Kindergarten Students Five Years Later	Birth-to-Kindergarten Survival Ratio	First Grade Students 6 Years Later	Birth-to-First Grade Survival Ratio
2007	162	110	272	264	0.971	338	1.243
2008	168	93	261	234	0.897	284	1.088
2009	141	65	206	237	1.150	306	1.485
2010	125	77	202	203	1.005	284	1.406
2011	106	73	179	202	1.128	276	1.542
2012	90	77	167	201	1.204	268	1.605
2013	90	71	161	182	1.130	247	1.534
2014	83	71	154	158	1.026	218	1.416
2015	86	89	175	177	1.011	226	1.291
2016	93	63	156	179	1.147	N/A	N/A
2017	81	67	148	N/A	N/A	N/A	N/A
2018	91	61	152	N/A	N/A	N/A	N/A
2019	77	89	166	N/A	N/A	N/A	N/A
2020	91	65	156	N/A	N/A	N/A	N/A

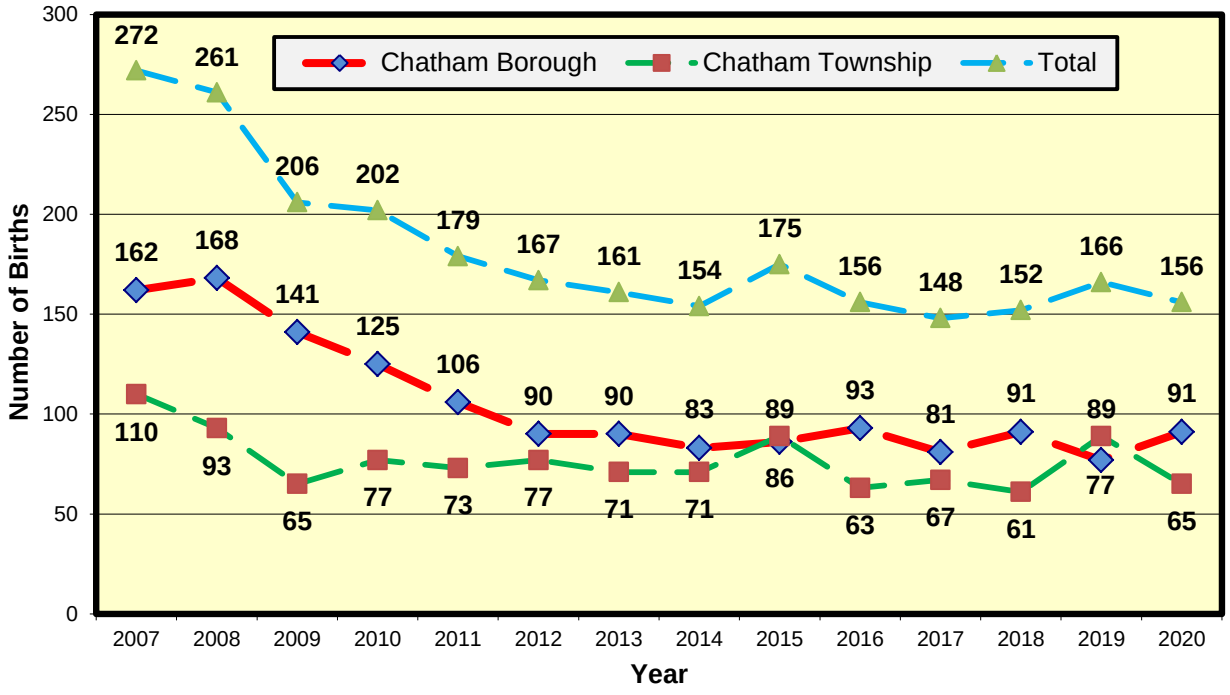
Note: [1]Birth data were provided by the New Jersey Center for Health Statistics.

Despite having a half-day kindergarten program, birth-to-kindergarten survival ratios have been above 1.000 in each of the last eight years, ranging from 1.005-1.204. In addition, birth-to-first grade survival ratios are shown in the table and were above 1.000 in each of the last ten years. This was computed since the district gains a significant number of children from half-day kindergarten to first grade (5-year average survival ratio = 1.34) as shown previously in Table 7. Since all of the birth-to-first grade survival ratios are above 1.000, this indicates that children who were born in other communities are moving into Chatham Borough or Chatham Township to attend first grade in the school district, reflecting inward migration.

Geocoded birth data were provided by the New Jersey Center for Health Statistics ("NJCHS") from 2007-2020 by assigning geographic coordinates to a birth mother based on her street address. Since the NJCHS did not have birth data for 2021, an estimate was formulated by averaging historical births. Birth counts were needed for 2021 since this cohort will become the kindergarten class of 2026.

As shown in Figure 15, the annual number of births in Chatham Township has been fairly stable since 2009, ranging from 61-89. In Chatham Borough, the annual number of births has been typically greater, peaking at 168 births in 2008 before declining. From 2012-2020, the annual number of births was fairly stable, ranging from 77-93. Combining the data from the two communities, the annual number of births steadily declined through 2014 before stabilizing. In 2020, there were 156 births, which are 116 fewer births than in 2007 (272). As a result of the decline in the number of births, kindergarten enrollment has declined from 264 in 2012-13 to 179 in 2021-22, which is a decline of 85 students. Similarly, first grade enrollment has declined from 307 in 2012-13 to 226 in 2021-22, which is a decline of 81 students.

Figure 15
Historical Birth Counts
2007-2020



Using mapping software, elementary school attendance area boundaries, and NJCHS birth data by Census block, the number of births from 2007-2020 was determined for each elementary school attendance area and is displayed in Table 9. In each year, some addresses of the mothers within Chatham Borough or Chatham Township were unknown. The greatest number of unknown addresses occurred in 2010, accounting for 19 of the 202 births (9.4%) in that year. For the purpose of projecting enrollments, the unknown addresses were redistributed into the three elementary attendance areas using proportional allocations of the births in each school attendance area with respect to the total number of births.

Table 9
Births by Elementary School Attendance Area
School District of the Chathams
2007-2020

Birth Year	Milton Avenue	Southern Boulevard	Washington Avenue	Unknown
2007	91	82	92	7
2008	97	74	86	4
2009	79	53	72	2
2010	62	52	69	19
2011	52	58	66	3
2012	47	66	53	1
2013	48	55	57	1
2014	37	56	61	0
2015	49	75	51	0
2016	33	49	74	0
2017	42	60	46	0
2018	48	51	53	0
2019	43	72	51	0
2020	50	57	48	1
Total 2007-2020	**778**	**860**	**879**	
Difference 2007-2020	**-41**	**-25**	**-44**	

For comparison purposes, Figures 16 and 17 show the number of births by elementary attendance area in 2007 and 2020 (using the same scale). In 2007, the greatest number of births occurred in the Washington Avenue attendance area while the Southern Boulevard attendance area had the greatest number of births in 2020. While the Southern Boulevard attendance area had the fewest births in 2007, the Washington Avenue attendance area had the fewest in 2020.

Table 9 also shows the differences in the birth counts by attendance area when comparing birth counts in 2007 to 2020. Each attendance area had fewer births in 2020 as compared to 2007. The Washington Avenue attendance area had the largest decline (-44) in the birth count over this time period.

Figure 18 shows the aggregated number of births by attendance area from 2007-2020. The Washington Avenue attendance area had the greatest number of births (879) over this time period while the Milton Avenue attendance area had the fewest (778).

In addition, as the elementary attendance areas in the school district are fairly large, it is sometimes difficult to determine the specific location(s) where birth counts are changing. As such, Figures 19 and 20 show the specific locations where births are occurring, as births by census block were mapped for 2007 and 2020. 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. For comparison purposes, the same scale was used for both maps, whereby dark blue reflects the greatest number of births in a census block. In 2007, the greatest number of births occurred in the Milton Avenue attendance area in Chatham Borough and in the Southern Boulevard attendance area in Chatham Township. In 2020, the greatest number of births occurred primarily in the Southern Boulevard attendance area in Chatham Township. In comparing the two figures, fewer blocks are shaded aqua or blue in 2020 as compared to 2007, which would indicate a decline in the number of births in those Census blocks. Figure 21 shows the aggregated number of births by Census block from 2007-2020. The greatest number of births, which is shaded dark blue, occurred in the Washington Avenue attendance area in Chatham Borough and in the Southern Boulevard attendance area in Chatham Township.

Figure 16
School District of the Chathams Births by Elementary Attendance Area 2007

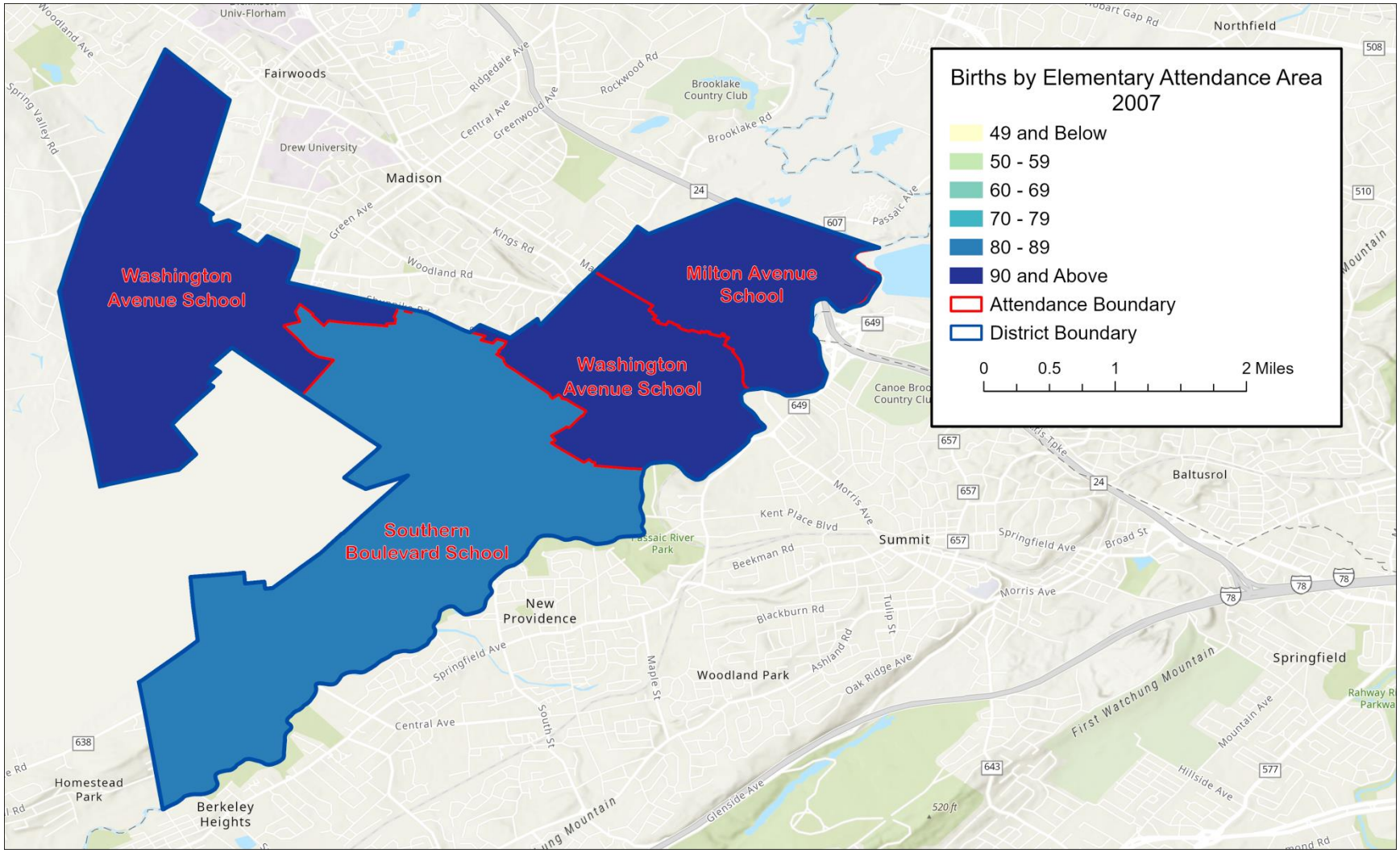


Figure 17
School District of the Chathams Births by Elementary Attendance Area
2020

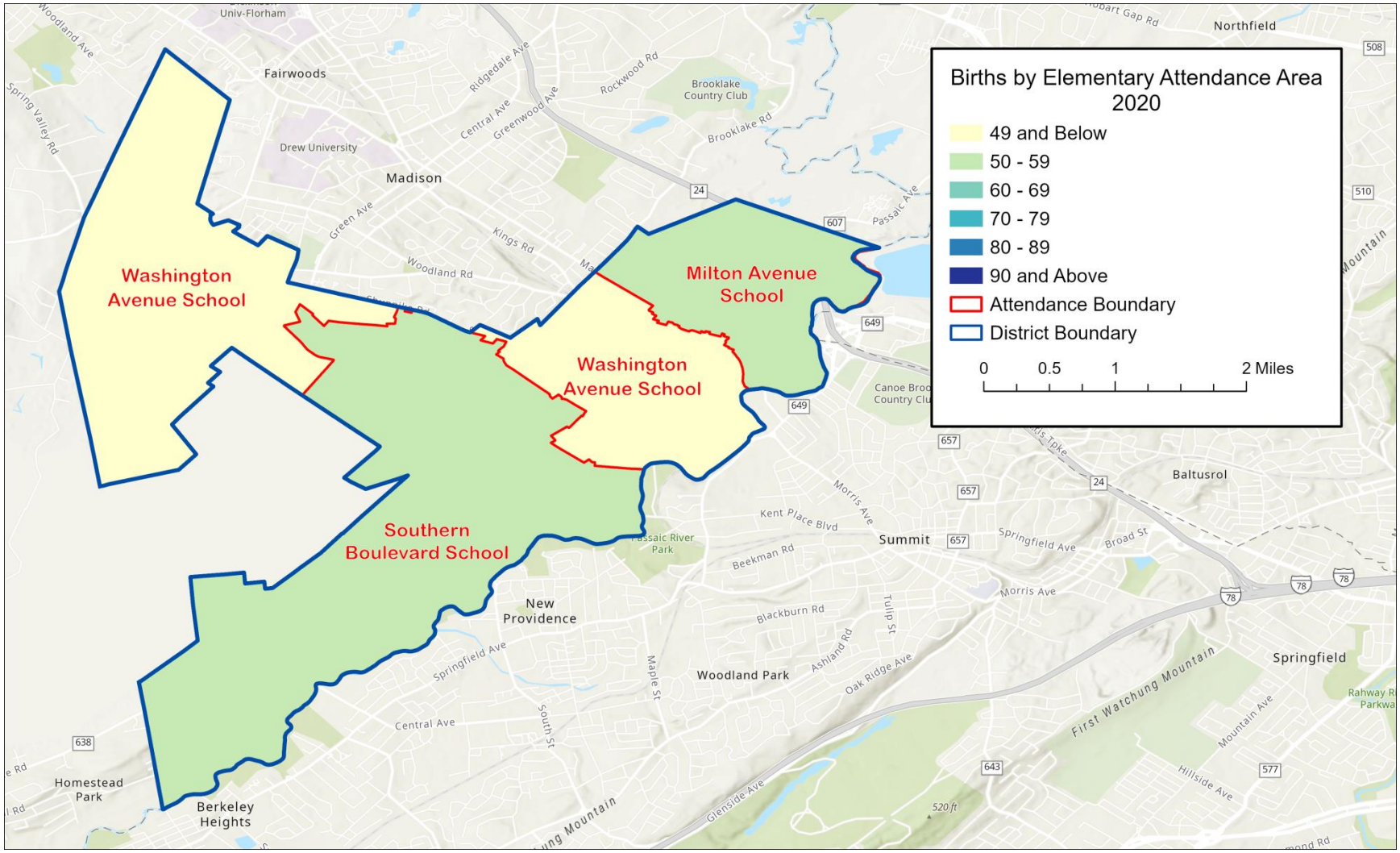


Figure 18
School District of the Chathams Births by Elementary Attendance Area 2007–2020

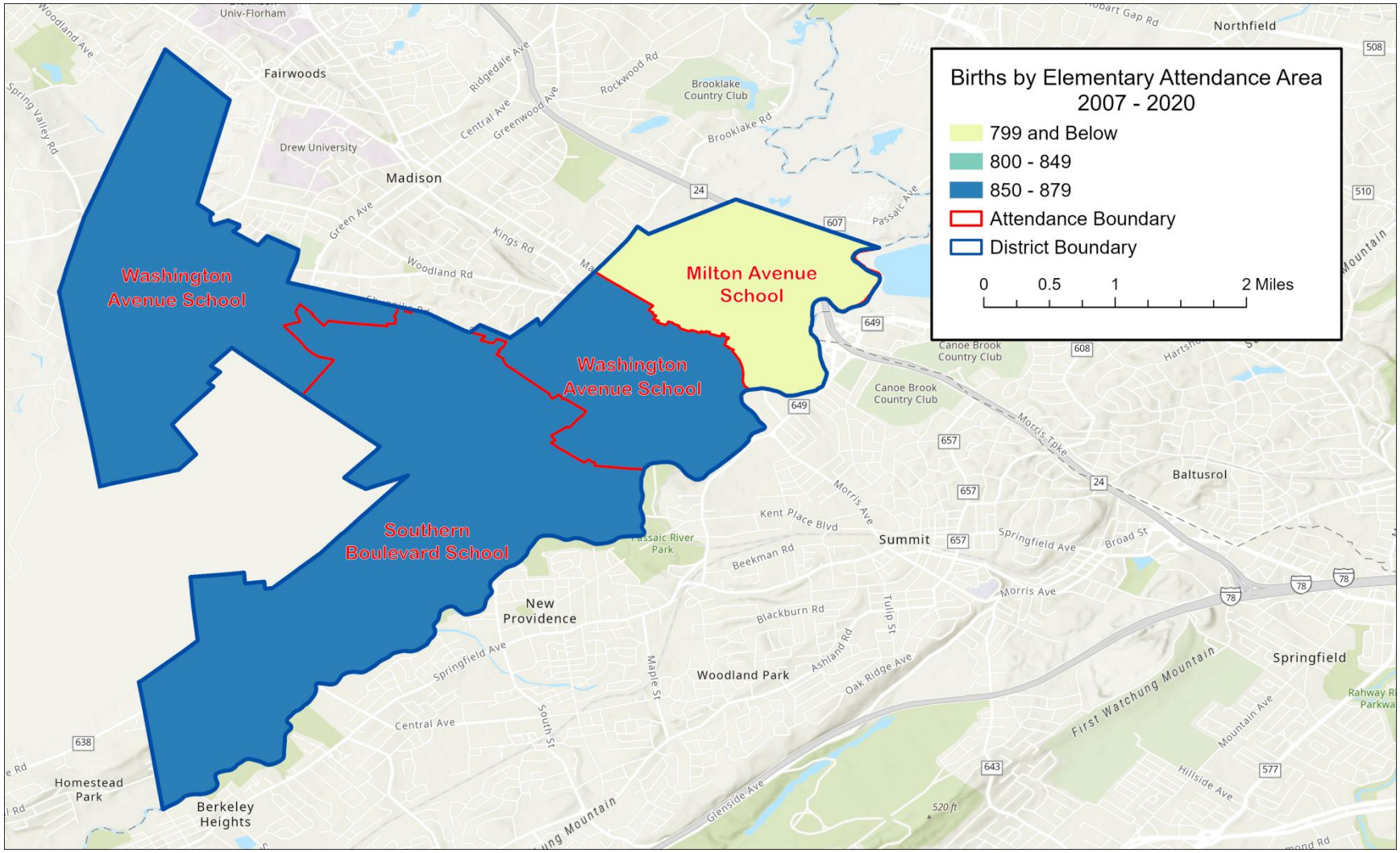


Figure 19
School District of the Chathams Births by Census Block 2007

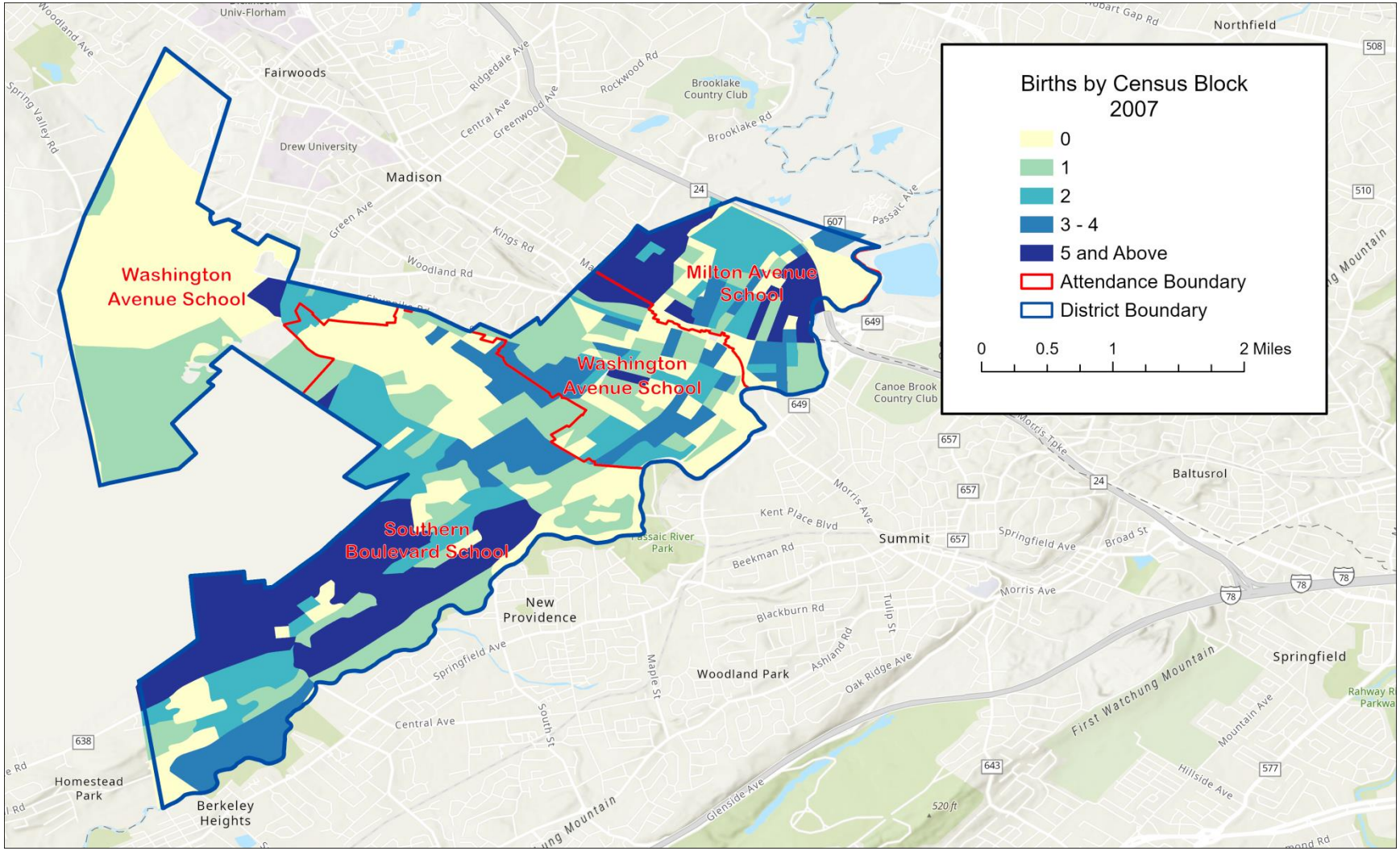


Figure 20
School District of the Chathams Births by Census Block
2020

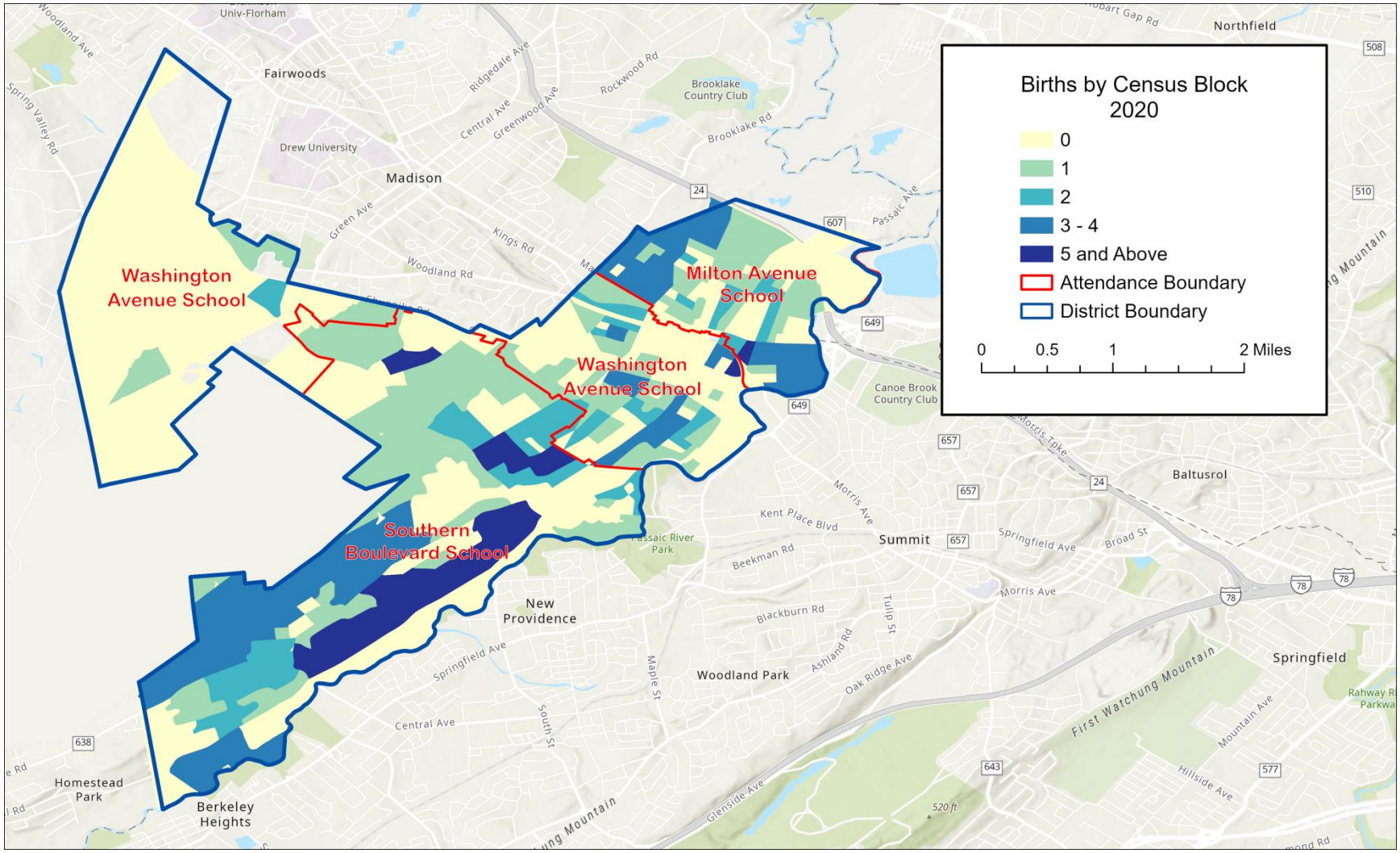
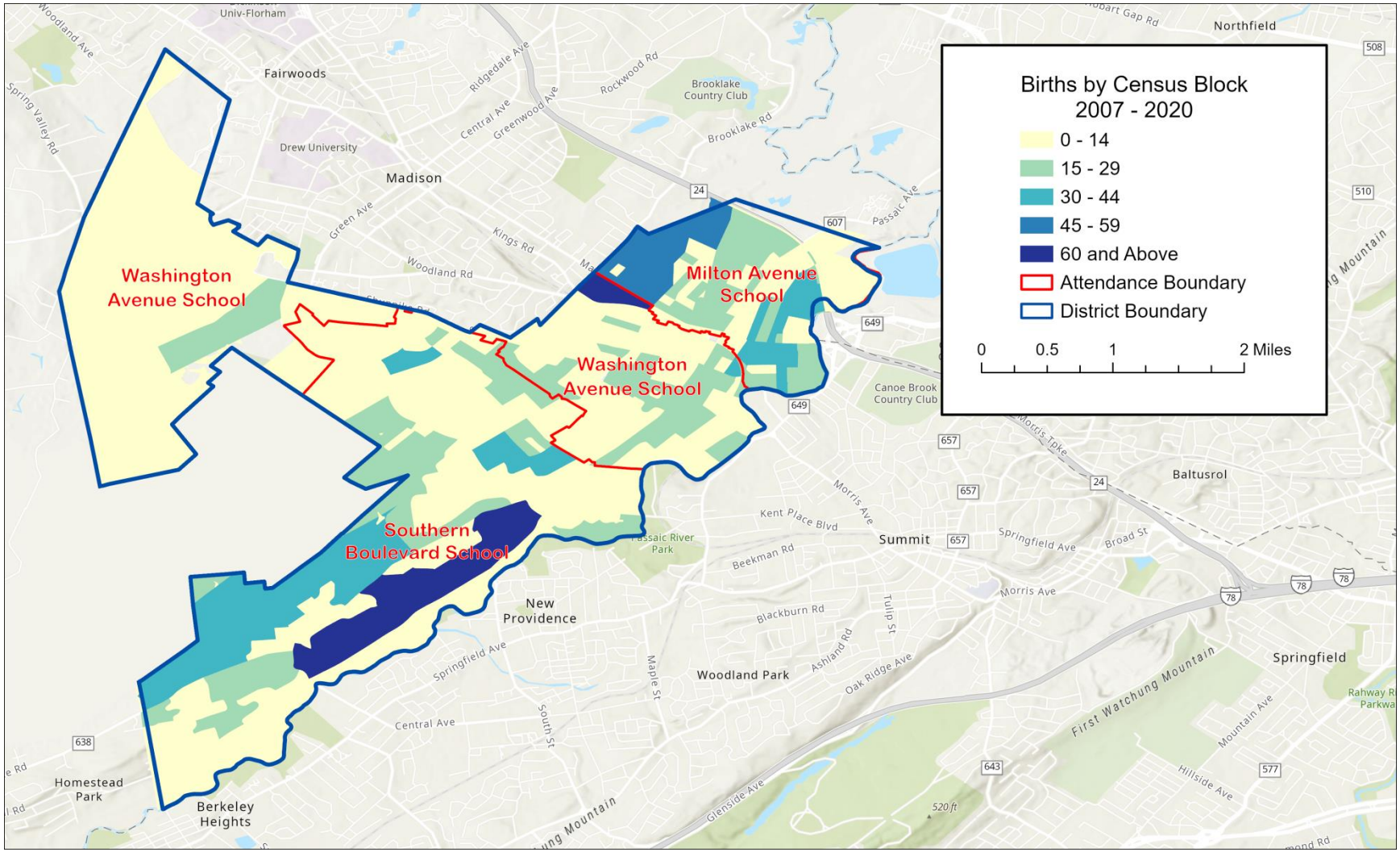


Figure 21
School District of the Chathams Births by Census Block
2007-2020



While the fertility rate in Chatham Borough is lower than those of both Morris County and the State of New Jersey, the fertility rate in Chatham Township is greater than that of the county and state. According to the 2016-2020 ACS, the fertility rate of women aged 15 to 50 was 23 births per 1,000 women in Chatham Borough and was 60 births per 1,000 women in Chatham Township. In comparison, as reported by the NJCHS, the 2020 fertility rate in Morris County was 52.9 births per 1,000 women (ages 15-49) and was 58.1 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 communities.

Population Age Structure

1. Chatham Borough

Figures 22 and 23 show the age pyramids of males and females in Chatham Borough from both the 2010 Census and the 2016-2020 ACS. In 2010, the largest cohort was aged 5-9 for both genders, which corresponds approximately with children in grades K-4. In communities with little inward or outward migration and low mortality, the largest cohort in subsequent years is typically the next oldest cohort as people advance in age. As such, the largest cohort in the 2016-2020 ACS was aged 10-14 for males (children in grades 5-9) as they aged in place. However, the largest cohort for females was the 50-54 age group. As the largest group for females in the 2016-2020 ACS was not the next oldest cohort, migration is likely occurring in the borough. As shown in Table 10, the greatest declines (shaded red) over this time period, both in number and percentage points, occurred in the 0-4 age group for males and females. The greatest gains (shaded blue), both in number and percentage points, occurred in the 15-19 age group for males, which corresponds approximately with high school and college-aged individuals, and the 55-59 age group for females.

Figure 22
Population Pyramid of Chatham Borough
2010 Census

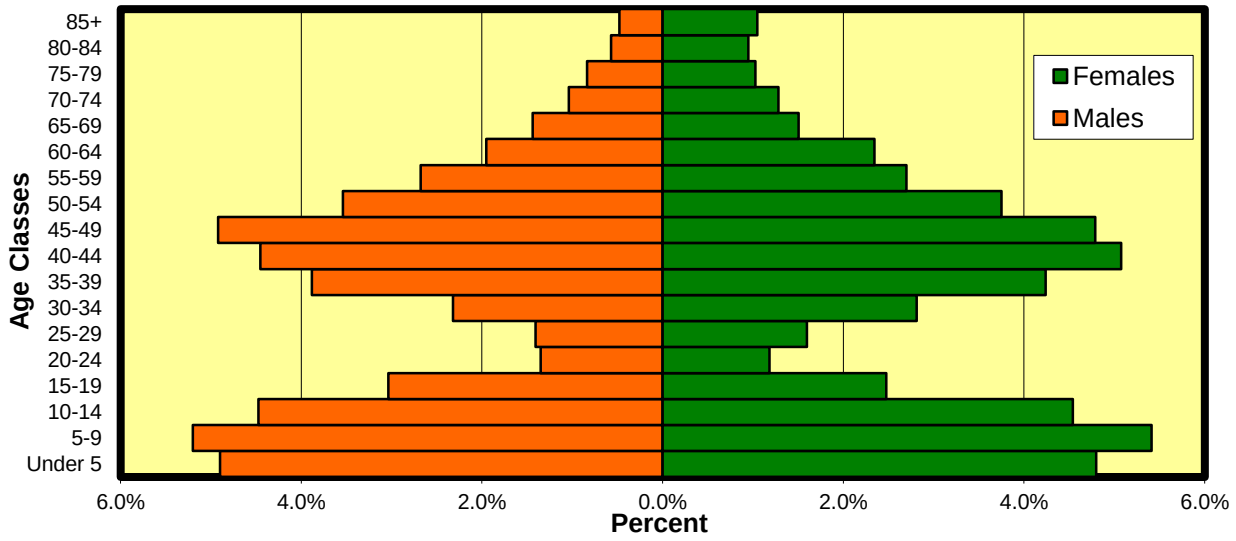


Figure 23
Population Pyramid of Chatham Borough
2016-2020 ACS

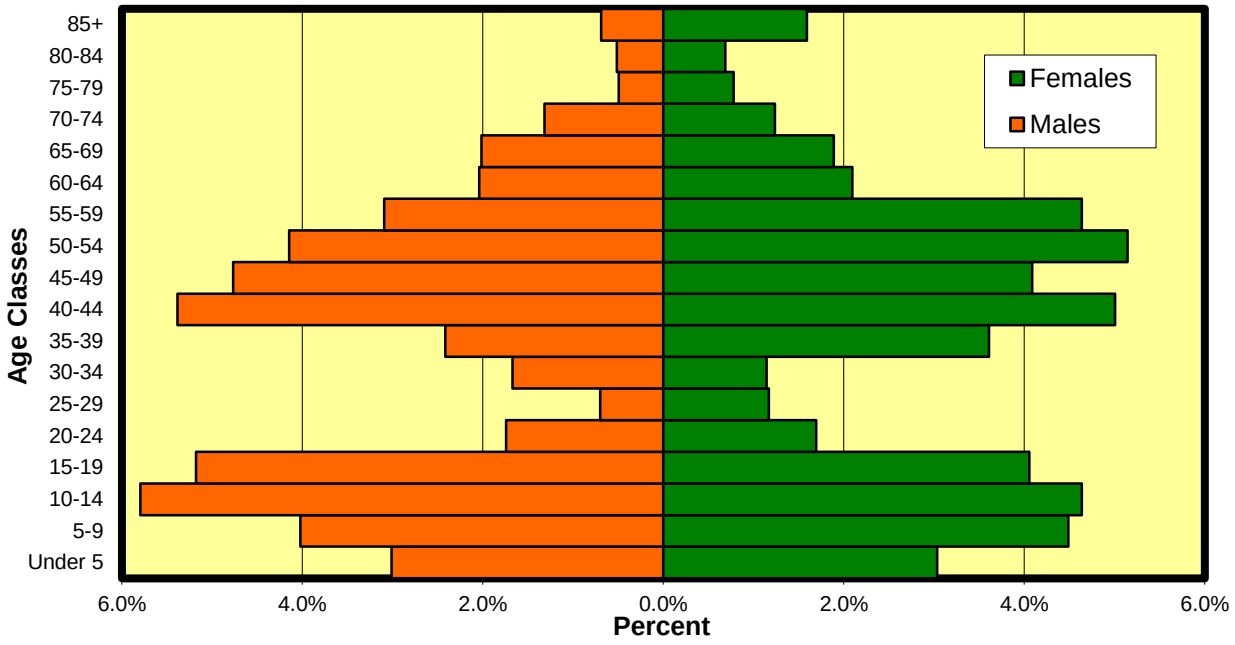


Table 10
Numerical and Percentage Point Changes of Males and Females
Chatham Borough
2010 Census to 2016-2020 ACS

	Males		Females	
Age Group	Numerical Change	Percentage Point Change	Numerical Change	Percentage Point Change
Under 5	-176	-1.9	-165	-1.8
5-9	-115	-1.2	-93	-0.9
10-14	+105	+1.3	-2	+0.1
15-19	+180	+2.1	+132	+1.6
20-24	+31	+0.4	+42	+0.5
25-29	-65	-0.7	-41	-0.4
30-34	-62	-0.6	-152	-1.7
35-39	-137	-1.5	-65	-0.6
40-44	+71	+0.9	-18	-0.1
45-49	-25	-0.2	-72	-0.7
50-54	+45	+0.6	+113	+1.4
55-59	+30	+0.4	+163	+1.9
60-64	+3	+0.1	-27	-0.2
65-69	+47	+0.6	+30	+0.4
70-74	+22	+0.3	-7	0.0
75-79	-32	-0.3	-24	-0.2
80-84	-6	-0.1	-25	-0.3
85+	+17	+0.2	+45	+0.5

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.

2. Chatham Township

Figures 24 and 25 show the age pyramids of males and females in Chatham Township from both the 2010 Census and the 2016-2020 ACS. In 2010, the largest cohort was aged 45-49 for both males and females. However, in the 2016-2020 ACS, the largest cohort was the 10-14 age group for males, which corresponds approximately with children in grades 5-9, and the 45-49 age cohort for females. As the largest groups in the 2016-2020 ACS were not the next oldest cohorts, migration is likely occurring in the township. As shown in Table 11, the greatest declines (shaded red) over this time period, both in number and percentage points, occurred in the 50-54 age group for males and the 85-and-over age group for females. The greatest gains (shaded blue), both in number and percentage points, occurred in the 10-14 age group for males and the 45-49 age group for females.

Figure 24
Population Pyramid of Chatham Township
2010 Census

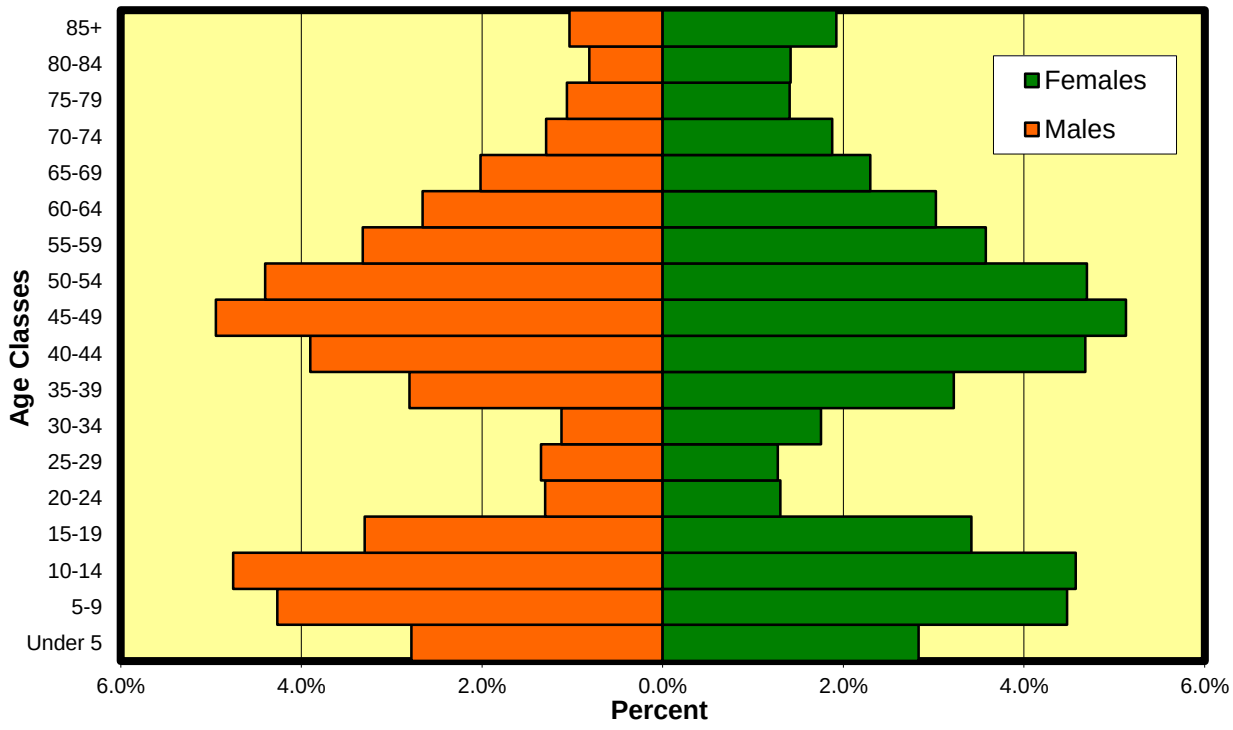


Figure 25
Population Pyramid of Chatham Township
2016-2020 ACS

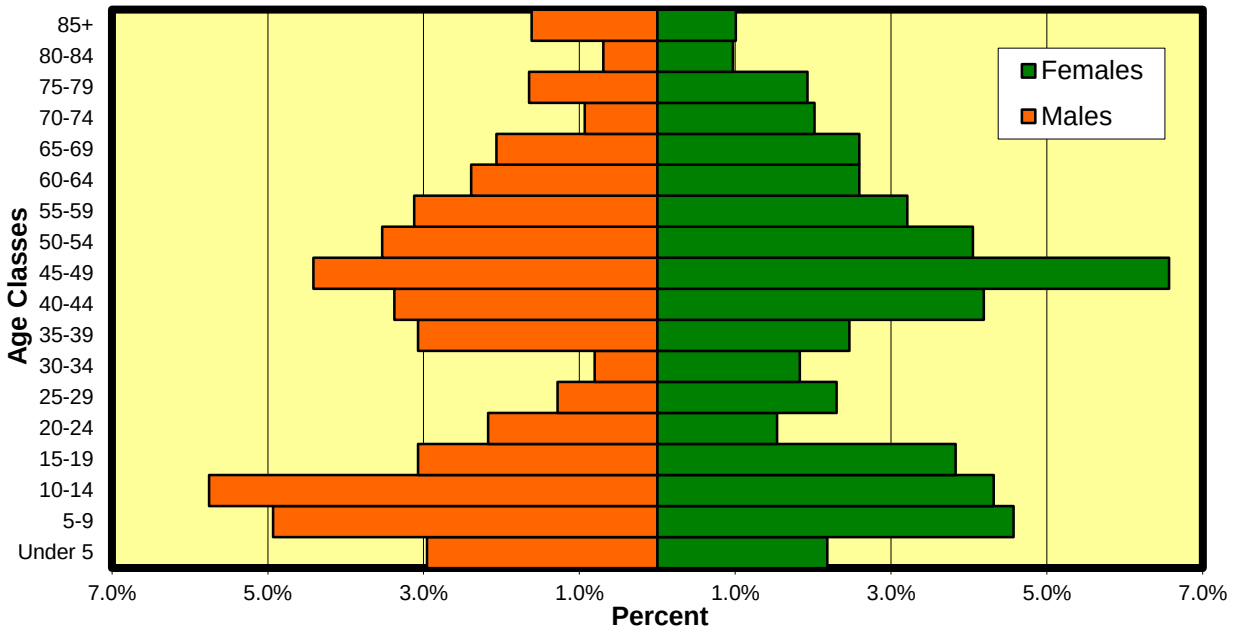


Table 11
Numerical and Percentage Point Changes of Males and Females
Chatham Township
2010 Census to 2016-2020 ACS

	Males		Females	
Age Group	**Numerical Change**	**Percentage Point Change**	**Numerical Change**	**Percentage Point Change**
Under 5	+11	+0.2	-73	-0.6
5-9	+58	+0.7	-1	+0.1
10-14	+91	+1.0	-37	-0.3
15-19	-31	-0.2	+34	+0.4
20-24	+86	+0.9	+21	+0.2
25-29	-10	-0.1	+102	+1.0
30-34	-35	-0.3	+4	+0.1
35-39	+21	+0.3	-85	-0.8
40-44	-63	-0.5	-61	-0.5
45-49	-66	-0.5	+135	+1.4
50-54	-99	-0.9	-77	-0.6
55-59	-28	-0.2	-46	-0.4
60-64	-34	-0.3	-51	-0.4
65-69	0	0.0	+25	+0.3
70-74	-40	-0.4	+10	+0.1
75-79	+57	+0.6	+50	+0.5
80-84	-14	-0.1	-49	-0.4
85+	+57	+0.6	-98	-0.9

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.

New Housing

1. Chatham Borough

Chatham Borough municipal representatives provided information regarding current and future residential development in the community. A list of approved and proposed developments, location, affected elementary school attendance areas, number of units, bedroom distribution (if available), housing type, and project status is shown in Table 12. The table excludes new houses to be built on single in-fill lots, or the subdivision of existing lots, or homes that are built after the demolition of an existing older home. In the latter instance, there is no net gain in the number of housing units. The location of each of the developments is shown in Figure 26.

In November 2016, Chatham Borough approved a settlement agreement with the Fair Share Housing Center regarding its affordable housing obligation, which has since been amended. The developments shown in the table will help to address the borough's affordable housing obligation. In total, there is the potential for 268 non age-restricted housing units in three separate developments, all of which are multi-family units such as apartments or condominiums. Of this amount, 53 units (20%) will be set aside to meet affordable housing requirements. Nearly all of the new housing units (94%) will be located in the Washington Avenue attendance area[5].

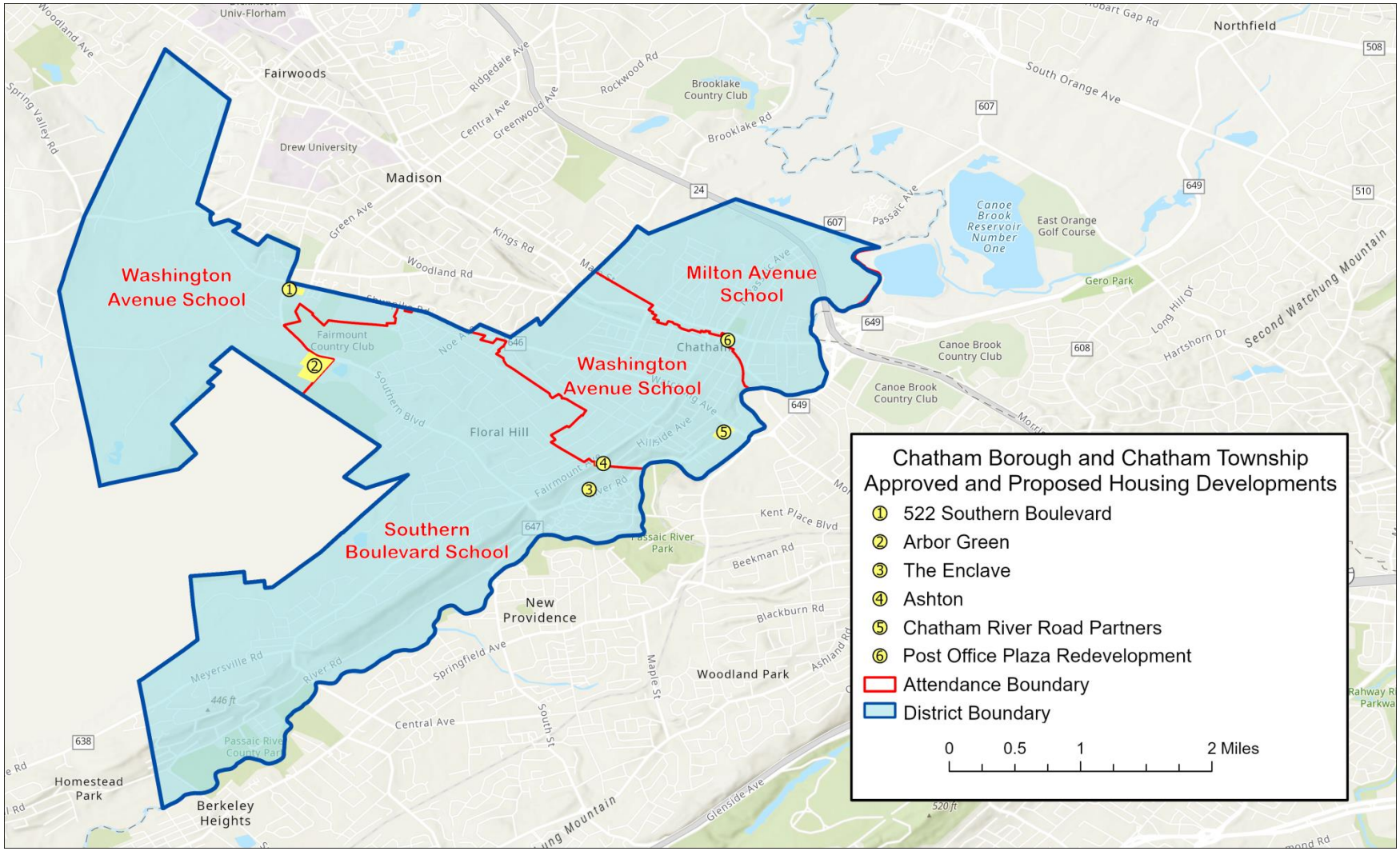
Table 12
Approved and Proposed Residential Developments in Chatham Borough

Development/ (Location)	Elementary Attendance Area	Number of Units	Bedroom Distribution	Housing Type	Notes
Ashton (312 Hillside Avenue)	Washington Avenue	8	2-BR	Condominium (Market-Rate and Affordable)	Project is approved but is not yet under construction. One (1) unit will be set aside for Low-Moderate Income households.
Chatham River Road Partners (12 & 16 River Road)	Washington Avenue	245	Market-Rate Apts. (208) 80 1-BR 128 2-BR Affordable Apts. (37) 7 1-BR 22 2-BR 8 3-BR	Apartment (Market-Rate and Affordable)	Project is approved and is under construction. 37 units will be set aside for Low-Moderate Income households.
Post Office Plaza Redevelopment (Off of Main Street, bounded by South Passaic Avenue and Hillside Avenue)	Milton Avenue	15	N/A	Apartment (Affordable)	Not approved.
Total	**268 Units**				

Source: Chatham Borough Administrator

[5] The Post Office Plaza Redevelopment is located on the boundary of the Milton Avenue and Washington Avenue attendance areas. While the project is located in both attendance areas, it was assumed that children would attend Milton Avenue School.

Figure 26
Chatham Borough and Chatham Township
Approved and Proposed Housing Developments



The largest development by Chatham River Road Partners will consist of 245 apartment units on River Road whereby 37 units will be set aside to meet affordable housing requirements. The project, which is under construction, will consist of primarily one- and two-bedroom units.

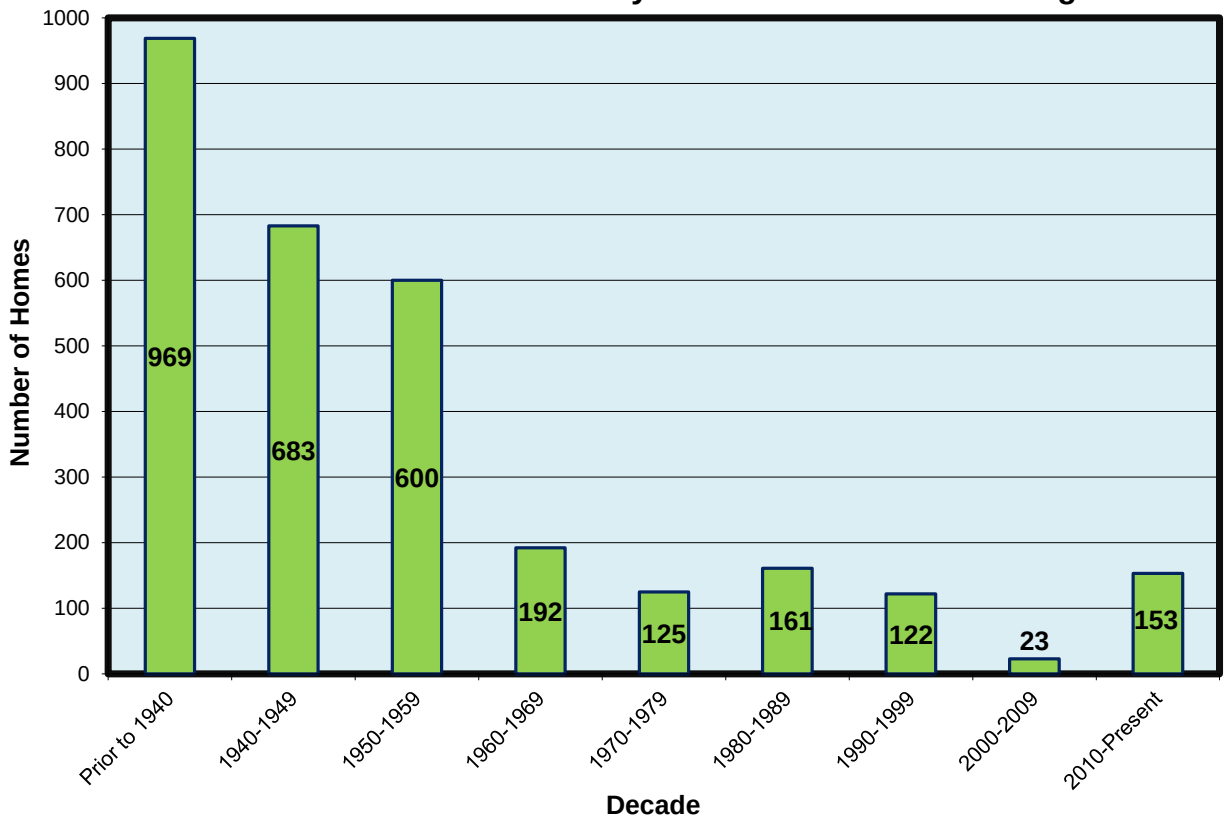
A second development, Ashton, will consist of eight (8) rental condominium units on Hillside Avenue. The development has been approved but is not yet under construction. All of the units will consist of two bedrooms.

Finally, there is the potential for 15 affordable apartment units as part of the Post Office Plaza Redevelopment, which has not been approved. The proposed bedroom distribution for the development was unavailable.

Distribution of Homes by Decade Built

Figure 27 shows the number of homes built by decade in Chatham Borough as provided by the 2016-2020 ACS. As shown in the figure, Chatham Borough has an older housing stock, as 85% of the homes were built before 1980. The number of homes constructed declined from 1940-1980 before stabilizing. From 1970 to the present, the number of homes built per decade has been fairly low, ranging from 23-161. Of the decades shown, the largest number of homes was built in the 1940s, which is nearly one-quarter (23%) of the housing stock and corresponds to the sizeable population gain in Chatham Borough (+51.2%) shown previously in Table 3.

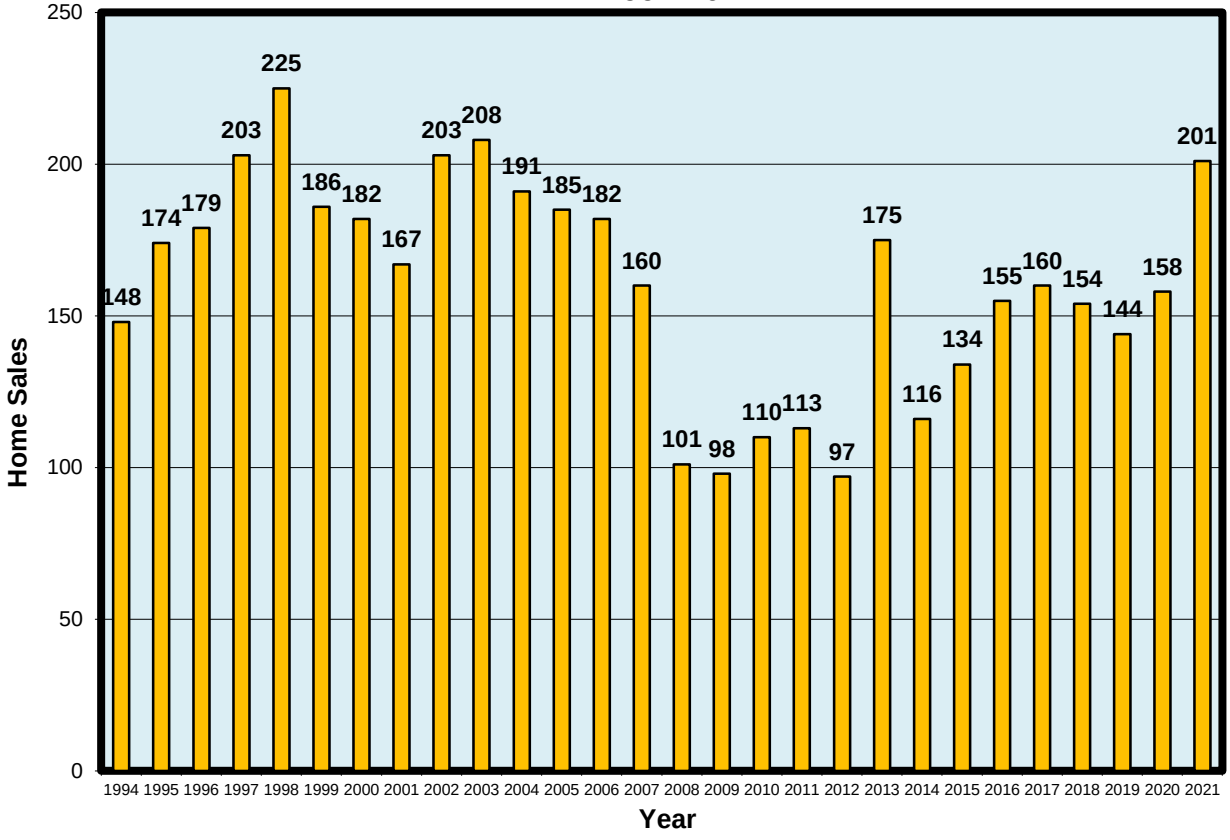
Figure 27
Number of Homes Built by Decade in Chatham Borough



Home Sales

In Figure 28, the number of annual home sales in Chatham Borough is shown from 1994-2021. Data for 2022 were incomplete and are not shown in the figure. 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. Home sales peaked at 225 in 1998 before declining to 97 in 2012 due to the housing market crash and banking crisis. During this period (2008-2012), the annual number of home sales was low, ranging from 97-113. Since then, home sales have rebounded and have steadily increased. In 2021, there were 201 sales, which is similar to the annual number of sales prior to the housing market crash and banking crisis.

Figure 28
Chatham Borough Home Sales
1994-2021



2. Chatham Township

Chatham Township municipal representatives provided information regarding current and future residential development in the community. A list of approved developments, location, affected elementary school attendance areas, number of units, bedroom distribution (if available), housing type, and project status is shown in Table 13. The table excludes new houses to be built on single in-fill lots, or the subdivision of existing lots, or homes that are built after the demolition of an existing older home. In the latter instance, there is no net gain in the number of housing units. The location of each of the developments is shown in Figure 26.

In December 2018, Chatham Township approved a settlement agreement with the Fair Share Housing Center regarding its affordable housing obligation, which has since been amended. The developments shown in the table will help to address the township's affordable housing obligation. In total, there is the potential for 140 non age-restricted housing units in three separate developments, all of which are multi-family units. Of this amount, 86 units (61%) will be set aside to meet affordable housing requirements. All of the new housing units will be located in either the Southern Boulevard or Washington Avenue attendance areas.

Table 13
Approved Residential Developments in Chatham Township

Development/ (Location)	Elementary Attendance Area	Number of Units	Bedroom Distribution	Housing Type	Notes
The Enclave (351 Hillside Avenue)	Southern Boulevard	54	3-BR	Townhouse	Former Dixiedale Farm. Under construction.
Arbor Green (411 Southern Boulevard)	Washington Avenue	24	4 1-BR 14 2-BR 6 3-BR	Affordable Apartment Units	Under construction and nearing completion.
522 Southern Boulevard	Washington Avenue	62	N/A	Affordable Apartment Units	Former Charlie Brown's restaurant. Units will be in three separate buildings. Approved but construction has not yet begun.
Total	**140 Units**				

Source: Chatham Township Construction Department

The first development, The Enclave by Toll Brothers, will consist of 54 luxury three-bedroom townhouses starting at $1.5 million. The project, which is currently under construction, will be located at the former Dixiedale Farm on Hillside Avenue.

A second development, known as Arbor Green, will consist of 24 affordable apartment units with a mix of 1-3 bedrooms. The project, which is under construction and is nearing completion, will be located at the former Skate Park on Southern Boulevard.

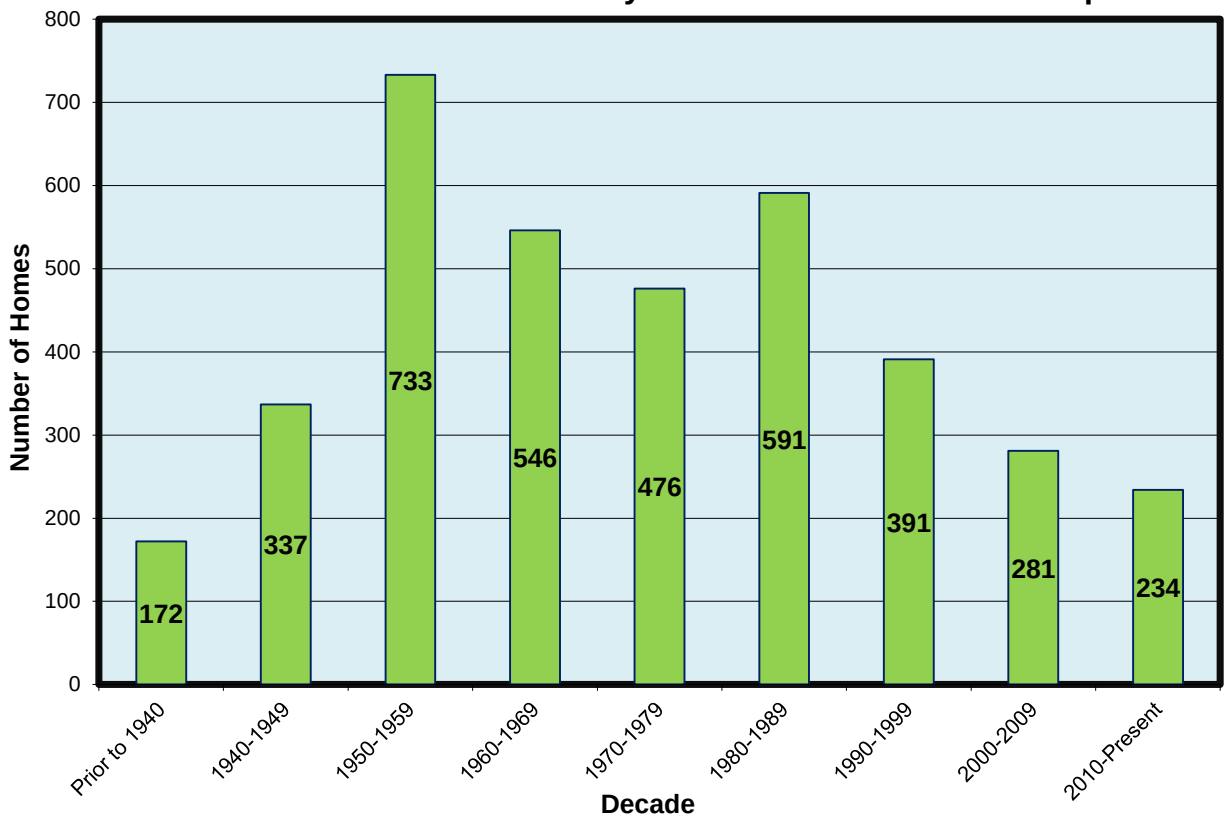
Finally, a third development of 62 affordable apartment units, which has been approved but is not yet under construction, will be located at the former Charlie Brown's restaurant on Southern Boulevard. The bedroom distribution of the development was not available.

It should be noted that Table 13 does not include the potential for two group homes on River Road, which should have no impact on the school district.

Distribution of Homes by Decade Built

Figure 29 shows the number of homes built by decade in Chatham Township as provided by the 2016-2020 ACS. Like Chatham Borough, Chatham Township also has an older housing stock with 60% of the homes being built prior to 1980. After peaking in the 1950s, the number of homes built per decade has been generally declining, with the exception of the 1980s. Of the decades shown, Chatham Township had the greatest number of homes built in the 1950s, which is 19% of the housing stock and corresponds with the significant population gain in Chatham Township (+109.9%) shown previously in Table 4.

Figure 29
Number of Homes Built by Decade in Chatham Township



Home Sales

In Figure 30, the number of annual home sales in Chatham Township is shown from 1994-2021. Data for 2022 were incomplete and are not shown in the figure. 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" were once again excluded from the totals. From 1994-2004, the number of home sales slowly increased, peaking at 266 sales in 2004. However, the number of sales declined to 140 in 2009 due to the housing market crash and banking crisis. During this period (2008-2012), the annual number of home sales was low, ranging from 140-179. From 2013-2021, home sales have increased. In 2021, there were 259 sales, which is similar to the annual number of sales prior to the housing market crash and banking crisis.

Figure 30
Chatham Township Home Sales
1994-2021

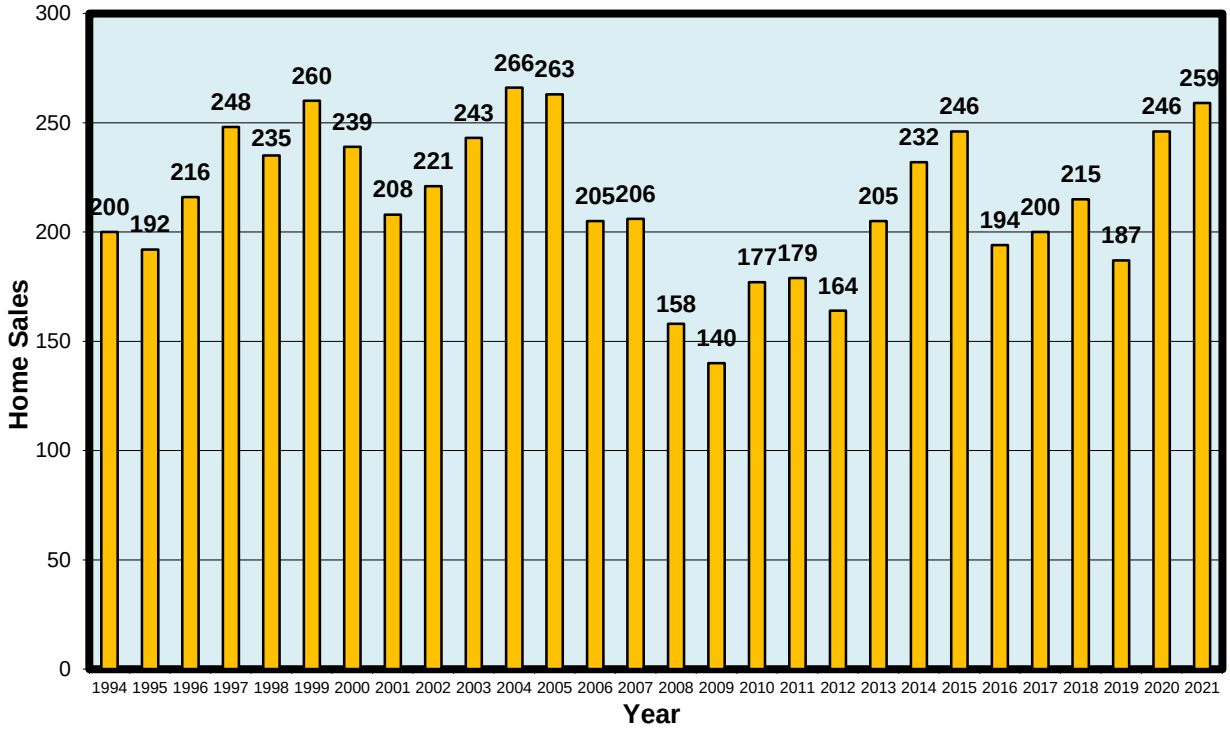
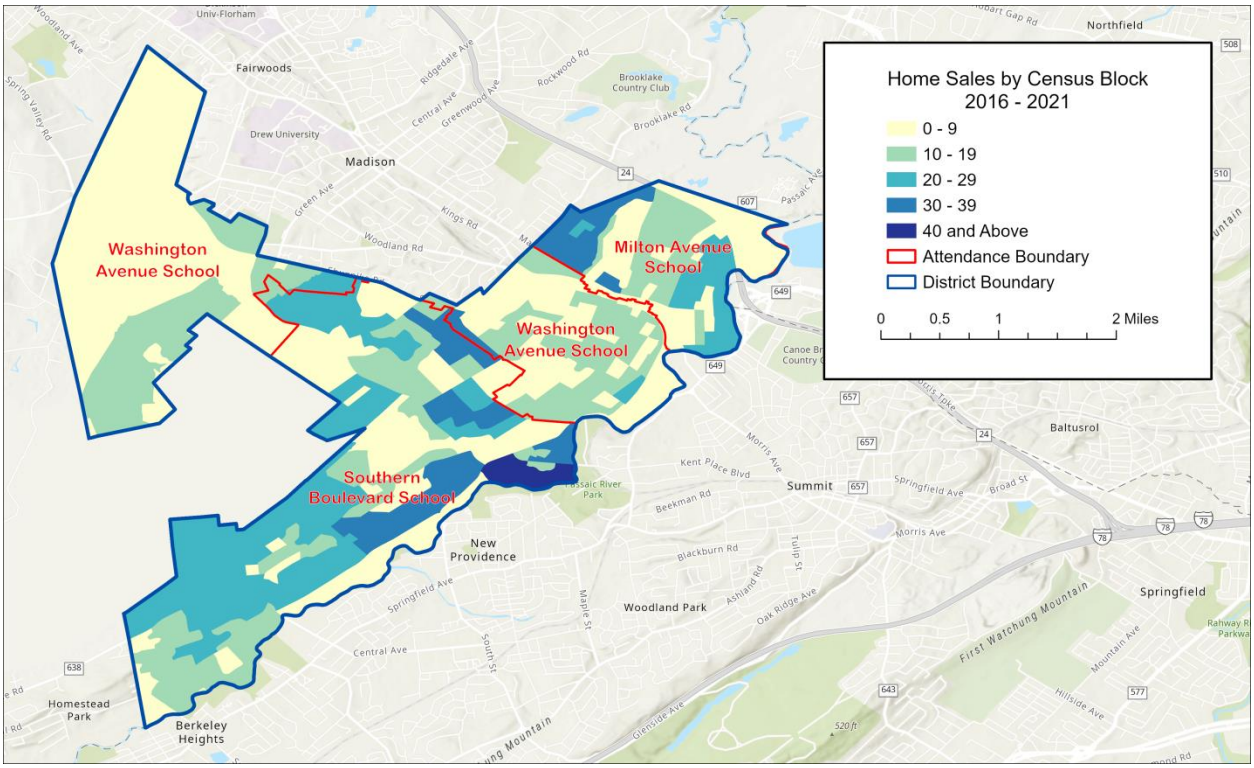


Figure 31 shows the aggregated number of home sales by census block from 2016-2021. Over this time period, the greatest number of sales occurred in census blocks in the Southern Boulevard attendance area in the southern section of Chatham Township.

Figure 31
Home Sales by Census Block
2016-2021



Historical Residential Construction

With respect to historical new construction, the number of new homes constructed in Chatham Borough and Chatham Township from 2017-2022 is shown in Table 14. A total of 212 homes were built over this time period, with a greater number (133) occurring in Chatham Township. Through internet research, it appears that most of the homes constructed in each town have been limited to building a new home after the demolition of an existing older home ("knockdown") or constructing new houses on single in-fill lots.

Table 14
Number of New Homes by Municipality
2017-2022

Year	Chatham Borough[1]	Chatham Township[1]	Total
2017	16	39	**55**
2018	18	14	**32**
2019	10	36	**46**
2020	25	18	**43**
2021	8	17	**25**
2022	2	9	**11**
Total	**79**	**133**	**212**

Note: [1]As derived from the Chatham Borough and Chatham Township property tax databases

As shown in Table 15, 90 single-family or two-family housing units were demolished in Chatham Borough from 2017-2022, which results in a net loss of 11 housing units since 2017. Regarding Chatham Township, 117 single-family or two-family housing units were demolished during the same time period, which results in a net gain of 16 housing units since 2017. If the data from the two communities are aggregated, there was a net gain of only five (5) housing units since 2017.

Table 15
Number of Home Demolitions and Net New Housing by Year
2017-2022

	Chatham Borough			Chatham Township		
Year	**Demolitions**	**COs**	**Net Total**	**Demolitions**	**COs**	**Net Total**
2017	29	16	**-13**	22	39	**+17**
2018	19	18	**-1**	31	14	**-17**
2019	14	10	**-4**	12	36	**+24**
2020	15	25	**+10**	11	18	**+7**
2021	8	8	**0**	36	17	**-19**
2022	5	2	**-3**	5	9	**+4**
Total	**90**	**79**	**-11**	**117**	**133**	**+16**

Source: New Jersey Department of Community Affairs

Student Yield Analysis of One- to Four-Family Homes

To determine the number of children per housing unit (student yield) in Chatham Borough and Chatham Township, each community's parcel-level MOD IV database was joined to the school district's 2021-22 student database. Age-restricted housing units, condominiums, and townhouses were removed from the property database, whereby the majority of remaining homes were detached single-family or duplexes. A total of 3,388 children living in 5,362 one- to four-family homes were identified. The remaining children in the school district either live in apartments, townhouses/condominiums, or mixed-use units (commercial and residential properties) or do not live in Chatham Borough or Chatham Township.

The simplest way to compute student yields is to divide the total number of students by the total number of homes. However, there are several drawbacks in computing yields in this fashion. First, the *type* of housing unit helps determine the magnitude of the student yield, as yields are typically greatest for detached single-family homes and smallest for multi-family homes such as apartments and townhouses/condominiums. A second 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, particularly if the school district has an excellent reputation.

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. As such, a unique student yield distribution by length of ownership was created for Chatham Borough and Chatham Township. It also 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 communities change where ethnic groups of larger or smaller 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 one- to four-family homes in Chatham Borough and Chatham Township were obtained from the Monmouth County Tax Board[6] MOD IV 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. To compute student yields by length of ownership, it was necessary to know the year of the most recent sale, where reliable sales data in the database were available from 1994-2021[7], a 27-year period. Determining the most recent sale date was not always obvious. Some of the most recent sales had a sales price of $1 or $100. These "paper sales" were coded as a non-usable deed transaction and were excluded from the analysis. These transactions include sales between members of the immediate family, resulting in a change in title but often not a change of the occupant. If there were no secondary sale dates, the length of ownership exceeded 27 years but the exact number of years was unknown.

[6] The database provides information for all municipalities in the state.
[7] Data for 2022 were incomplete and not used in the analysis.

One of the limitations of the database was the lack of recorded sales prior to 1994. Since many of the homes (n = 1,372) have never been sold since 1994, the earliest sale date recorded, the length of ownership exceeded 27 years for these homes but the exact length of ownership was unknown. Chatham Borough and Chatham Township also had homes constructed after 1994 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 2021.

Student Yields by Length of Ownership for One- to Four-Family Homes

Student yields by length of ownership for one- to four-family homes was determined by joining Chatham Borough's and Chatham Township's parcel-level property databases with 2021-22 student address data, which was provided by the school district. It is expected that longer-held homes will have fewer children, as they would have graduated from the district. Figure 32 shows that student yields increase with length of ownership, peaking at 1.29 children per housing unit with eight (8) years of ownership. Student yields then begin to decline as length of ownership increases. For homes with 22 or more years of ownership, student yields were below 0.30. Table 16 shows the student yields by length of ownership for the K-12 student population (public school students only).

Figure 32
Chatham Borough and Chatham Township
Student Yields by Length of Ownership
One- to Four-Family Homes

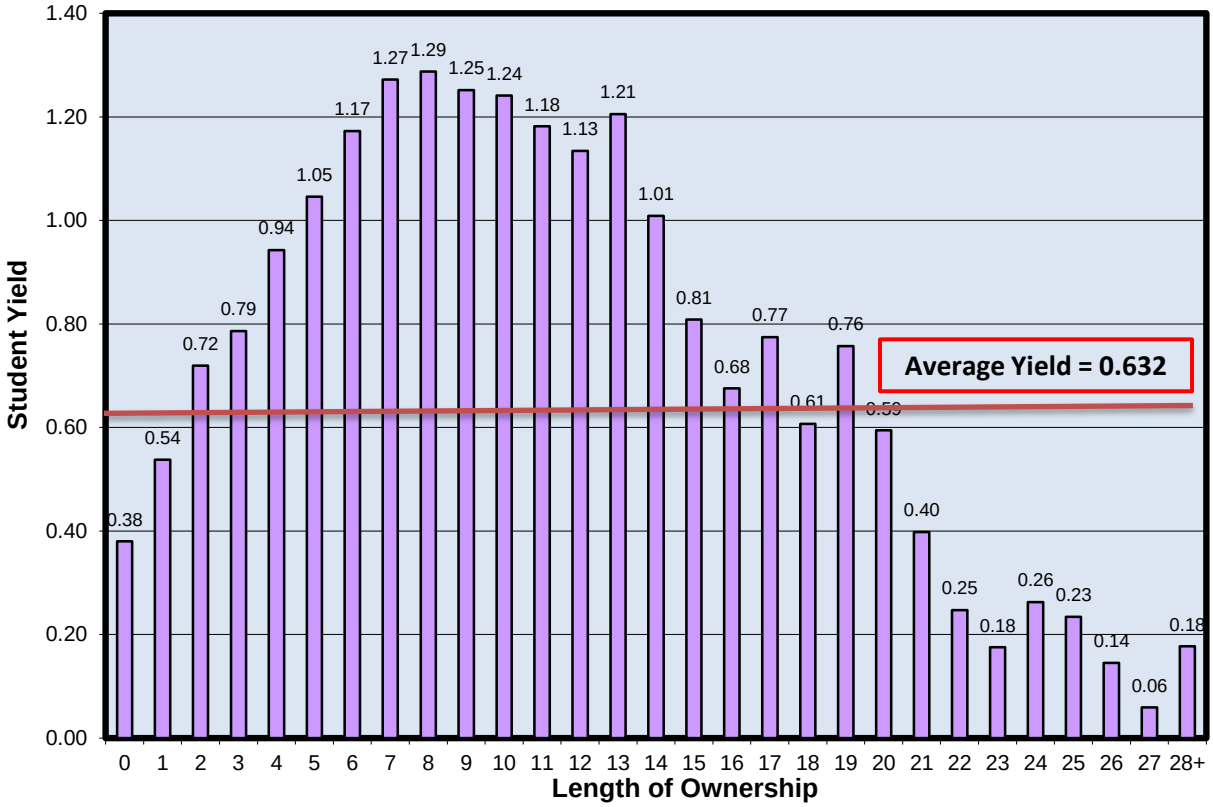


Table 16
Chatham Borough and Chatham Township
One- to Four-Family Homes Student Yields (K-12)
by Current Length of Ownership

Years of Ownership	Housing Units	Students 2021-22	Student Yield
0	208	79	0.38
1	415	223	0.54
2	189	136	0.72
3	234	184	0.79
4	227	214	0.94
5	218	228	1.05
6	191	224	1.17
7	169	215	1.27
8	174	224	1.29
9	155	194	1.25
10	116	144	1.24
11	121	143	1.18
12	119	135	1.13
13	73	88	1.21
14	113	114	1.01
15	115	93	0.81
16	117	79	0.68
17	102	79	0.77
18	117	71	0.61
19	103	78	0.76
20	106	63	0.59
21	93	37	0.40
22	81	20	0.25
23	97	17	0.18
24	99	26	0.26
25	94	22	0.23
26	76	11	0.14
27	68	4	0.06
28+	1,372	243	0.18
Total	**5,362**	**3,388**	**0.632**

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 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 computed from the entire housing stock, which is 0.632 children per home, likely underestimates the actual student yield when a family either moves into a new (or resale) one- to four-family home. If the average student yield is computed for the first eight (8) years of ownership when the peak student yield occurs, the yield increases to 0.853. This is likely a better estimate of the student yield of one- to four-family homes in Chatham Borough and Chatham Township.

Student Yield Analysis for Townhouses and Condominiums

Student yields were also computed for townhouses and condominiums in Chatham Borough and Chatham Township, which are shown for each development in Table 17. Counts of students are shown by grades K-5, 6-8, and 9-12, which is the school district's grade configuration. Unlike the prior analysis, 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. Through internet research, we were able to identify the approximate sales price, the year the development was built, bedroom distribution, and the number of units. A total of 87 public school children (K-12) were identified living in 1,044 units, which is an average student yield of 0.083. In general, student yields are quite low. Of the two communities, Chatham Borough (0.158) had the larger average student yield. The largest student yields, in developments with at least 25 units, are in Chatham Court in Chatham Borough (0.184) and Coachlight Square in Chatham Township (0.167).

Student Yield Analysis for Apartments

Student yields were also computed for apartment complexes in Chatham Borough and Chatham Township as shown in Table 18. Counts of students are shown by grades K-5, 6-8, and 9-12, which is the school district's grade configuration. The table is <u>not</u> an all-inclusive list of all apartment units, as it only includes large apartment complexes. The list does not include small multi-family buildings with fewer than five units or mixed-use properties with apartments above retail space. Through internet research, we were able to identify the rental price (if available), the year the development was built, bedroom distribution (if available), and the number of units. A total of 99 public school children (K-12) were identified living in 782 units, which is an average student yield of 0.127. Of the two communities, Chatham Borough (0.198) had the larger average student yield. The largest student yields, in developments with at least 25 units, are in Spring Brook at Chatham (0.340) and Jackson House (0.257), both of which are located in Chatham Borough.

Table 17
Chatham Borough and Chatham Township Student Yields (K-12) for Condominiums and Townhouses

Development	Town	Price ($)[1]	Year Built	Bedrooms	Number of Units[2]	K-5 Students	6-8 Students	9-12 Students	K-12 Students[3]	2021-22 Student Yield
Chatham Condos (The)	Chatham Borough	850,000+	2005	2-3 BR	8	0	0	0	**0**	**0.000**
Chatham Court	Chatham Borough	325,000+	1945	1-2 BR	49	2	3	4	**9**	**0.184**
Willows (The)[4]	Chatham Borough	685,000-810,000	1997-1999	3-BR	44	0	4	3	**7**	**0.159**
Chatham Borough Totals					**101**	**2**	**7**	**7**	**16**	**0.158**
Briarwood	Chatham Township	305,000-425,000	1984	1-2 BR	197	7	2	3	**12**	**0.061**
Coachlight Square	Chatham Township	400,000-615,000	1984-1985	2-3 BR	102	8	2	7	**17**	**0.167**
Heritage Greene	Chatham Township	350,000-510,000	1986	1-2 BR	220	2	0	3	**5**	**0.023**
RoseValle Townhouses	Chatham Township	1,500,000-1,900,000	2007-2013	3-4 BR	56	0	0	0	**0**	**0.000**
Sutton Woods	Chatham Township	350,000-900,000	1986, 1989, 1993	1-3 BR	296	9	7	10	**26**	**0.088**
Vernon Grove[5]	Chatham Township	100,000+	1986	1-3 BR	72	5	2	4	**11**	**0.153**
Chatham Township Totals					**943**	**31**	**13**	**27**	**71**	**0.075**
School District of the Chathams Totals					**1,044**	**33**	**20**	**34**	**87**	**0.083**

Notes: [1]Sale price information was obtained from www.njcondos.net or public sale records.
[2]As derived from the Chatham Borough and Chatham Township property databases
[3]Based on 2021-22 enrollments in the School District of the Chathams
[4]Contains six affordable units
[5]Consists of all affordable units

Table 18
Chatham Borough and Chatham Township Student Yields (K-12) for Apartments

Development (Property Address)	Town	Rent ($)[1]	Year Built	Bedrooms	Number of Units[1]	K-5 Students	6-8 Students	9-12 Students	K-12 Students[2]	2021-22 Student Yield
Chatham Arms (49 S. Passaic Avenue)	Chatham Borough	2,250-2,850	1942	1-2 BR	31	0	0	0	**0**	**0.000**
Chatham on Main (500, 525, 555 Main Street)	Chatham Borough	2,400-3,000	1955	1-2 BR	119	5	6	6	**17**	**0.143**
Jackson House (515 Main Street)	Chatham Borough	2,160-2,450	1968	1-2 BR	35	4	2	3	**9**	**0.257**
Lafayette Gardens (31-47 Lafayette Avenue)	Chatham Borough	N/A	1953	1-2 BR	40	1	0	2	**3**	**0.075**
Spring Brook at Chatham (540, 575 Main Street)	Chatham Borough	2,675-3.450	1957	1-3 BR	100	15	5	14	**34**	**0.340**
Willow Court[3] (1-8 Lackawanna Avenue)	Chatham Borough	3,750	2002	2-3 BR	8	3	0	0	**3**	**0.375**
Chatham Borough Totals					**333**	**28**	**13**	**25**	**66**	**0.198**
Cardinal Hill (420 River Road)	Chatham Township	2,025 -2,570	N/A	1-2 BR	120	2	4	2	**8**	**0.067**
Chatham Hill (25 Hickory Place)	Chatham Township	2,598-5,265	1970	1-3 BR	308	11	1	6	**18**	**0.058**
Wythe House (495 Main Street)	Chatham Township	1,200+	1950	0-2 BR	21	1	3	3	**7**	**0.333**
Chatham Township Totals					**449**	**14**	**8**	**11**	**33**	**0.073**
School District of the Chathams Totals					**782**	**42**	**21**	**36**	**99**	**0.127**

Notes: [1]As derived from internet research
[2]Based on 2021-22 enrollments in the School District of the Chathams
[3]Contains two affordable units
Unit counts shaded red were estimated through satellite imagery as unit count was unavailable

Table 19 summarizes the student yields for townhouses/condominiums and apartments for the K-5, 6-8, and 9-12 grade configurations. Student yields are greatest for children in grades K-5 for apartments, which is not unexpected since there are six grades. However, for townhouses/condominiums, student yields are greatest in the 9-12 grade configuration. The overall student yield for apartments is higher than that of townhouses/condominiums.

Table 19
Student Yields by Housing Type in Chatham Borough and Chatham Township

Housing Type	K-5 Student Yield	6-8 Student Yield	9-12 Student Yield	K-12 Student Yield[1]
Townhouse/ Condominium	0.031	0.019	0.033	**0.083**
Apartment	0.054	0.027	0.046	**0.127**

Note: [1]Student yields are based on 2021-22 enrollments in the School District of the Chathams.

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 approved and proposed housing developments in Chatham Borough and Chatham Township. **It should be clearly stated that this is a rough estimate, as the bedroom distribution of some of the developments was unavailable, which is needed to compute the estimated number of public school children. In addition, one development (Post Office Plaza Redevelopment) has not been approved and may not come to fruition, may change in scope before being approved, or may be constructed and occupied outside of the five-year enrollment projection timeframe.**

Since there are a limited number of comparable affordable housing units in Chatham Borough and Chatham Township, *Who Lives in New Jersey Housing?*[8], published by the Rutgers University Center for Urban Policy Research ("CUPR"), was also utilized. The resource provides statewide housing multipliers (student yields) based on housing type, number of bedrooms, housing value, housing tenure (ownership versus rental), and whether the housing units are market-rate or affordable.

To project the number of public school children from the new housing units, several assumptions were made:

1. The student yield multipliers used from CUPR are from a sample of New Jersey homes and these multipliers would be representative of the families moving into Chatham Borough and Chatham Township.

2. When not available, all affordable apartment units were assumed to have the following distribution: 1-bedroom = 20%, 2-bedroom = 60%, 3-bedroom = 20%.

[8] Listokin, David, and Voicu, Alexandru. (2018). Who Lives in New Jersey Housing? Updated New Jersey Demographic Multipliers. Rutgers University Center for Urban Policy Research.

3. All affordable apartment/condominium units were assumed to have the following student yield multipliers: 1-bedroom = 0.088, 2-bedroom = 0.408, 3-bedroom = 1.087.

4. All market-rate apartment units with 1-2 bedrooms were assumed to have the average Chatham Borough and Chatham Township student yield multiplier for 1-2 bedroom apartments: 0.107.

5. All market-rate condominium units in Ashton were assumed to have the average Chatham Borough and Chatham Township student yield multiplier for 1-2 bedroom townhouses/condominiums: 0.056.

6. All market-rate townhouse units with three (3) bedrooms were assumed to have the existing student yield multiplier of The Willows and RoseValle: 0.070.

7. The full build-out and occupation of Ashton and Arbor Green would be completed in the 2023-24 school year.

8. The full build-out and occupation of the Post Office Plaza Redevelopment would be completed in the 2024-25 school year.

9. The full build-out and occupation of Chatham River Road Partners and The Enclave, which are under construction, would be completed over a two-year period (2023-24 and 2024-25).

10. The full build-out and occupation of 522 Southern Boulevard, which has been approved but is not yet under construction, would be completed over a two-year period (2024-25 and 2025-26).

In total, 95 public school children (K-5 = 42, 6-8 = 24, and 9-12 = 29) in grades K-12 are projected according to the following distribution:

- Arbor Green – 13 (6 K-5, 3 6-8, 4 9-12)
- Ashton – 1 (1 K-5, 0 6-8, 0 9-12)
- Chatham River Road Partners – 40 (16 K-5, 11 6-8, 13 9-12)
- The Enclave – 4 (0 K-5, 2 6-8, 2 9-12)
- Post Office Plaza Redevelopment – 7 (4 K-5, 1 6-8, 2 9-12)
- 522 Southern Boulevard – 30 (15 K-5, 7 6-8, 8 9-12)

When determining the impact of future new housing, it should be clearly stated that enrollment projections utilize cohort survival ratios that do take into account prior new home construction growth. Children who move into new homes during the historical period are captured by the survival ratios, as these ratios will be used to project future enrollments. Therefore, it is not appropriate to add all of the new children generated from future housing units without considering the historical period, as double counting would occur, since the survival ratios have already increased due to the new children. The baseline enrollment projections should only be adjusted if the projected housing growth is significantly greater than prior housing growth. From 2017-2022, there was a net gain of five (5) non age-restricted new housing units in Chatham Borough and Chatham Township. With respect to future construction, there is the potential for 408 non age-restricted housing units in the two communities, which would be significantly greater than that which occurred since 2017. Therefore, the baseline enrollment projections were subsequently modified to account for additional children from the new housing. The modifications occurred in the elementary attendance areas where the new housing is being constructed, as well as the upper-level schools. **The modification to the enrollment projections assumes that all potential developments listed in Tables 12 and 13 will be built and occupied in the next five years. One development has yet to be approved and may be constructed outside of the enrollment projection timeframe, or may not be built at all.**

Enrollment Projections

In two separate projections, enrollments were calculated at the school level from 2022-23 through 2026-27, a five-year period. The first set of projections (referred to as "baseline") do not reflect the anticipated housing growth in Chatham Borough and Chatham Township. If the housing developments shown previously do not come to fruition or are not built within the anticipated construction timeline, the baseline enrollment projections would best reflect the future enrollments in the school district. The second set of projections (referred to as "adjusted") reflects projected enrollments adjusted for housing growth, assuming the timeline of construction and occupancy discussed previously. In the latter projections, it was also assumed that the number of pre-kindergarten and special education students shown in the baseline projections would remain the same.

Since the grade counts in the elementary school projections are smaller as compared to computing districtwide grade counts, the reliability of the school projections are lower than the overall districtwide projections. In general, the smaller the forecasted population, the higher the probability of error associated with the projection.

With respect to grade-level pre-kindergarten students in Milton Avenue, enrollments were projected by computing an average based on historical data from the last five years and using this value throughout the five-year projection period. In the last five years, grade-level pre-kindergarten enrollments have been fairly inconsistent, ranging from 28-56 students per year. It was estimated that there would be 42 students in the program annually in the future. Pre-kindergarten children with special needs were not included in these counts and were instead included with the special education projections.

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

On September 10, 2010, former New Jersey Governor Chris Christie signed into law the Interdistrict School Choice Program ("Choice"), 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 district sets the number of openings per grade level. The School District of the Chathams 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 enrollments. School districts categorized as District Factor Group[9]

[9] 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.

("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
- 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 School District of the Chathams is a "Targeted" district since its DFG is "J" with a concentration of at-risk pupils less than 40 percent (0.77%). In Table 20, the estimated number of total eligible pre-school students is provided with the 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 four (4) pre-kindergarten students as a result of the SFRA, which would have little impact on the district. 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 20
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	**4**	1	1	2	3	4

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

In a different pre-school initiative, the administration of Governor Phil Murphy announced the availability of Preschool Education Expansion Aid ("PEEA") in 2018. In September 2018, the first round of funding ($20.6 million) was publicized, where 31 districts

received aid to expand their pre-kindergarten programs. A second round of funding was announced in January 2019, providing 33 additional school districts with roughly $27 million in funding. The second round targeted districts whose free and reduced lunch percentage was above 20% and who have not previously received State preschool aid. Some districts that were eligible to apply for PEEA would fall under the "Universal" category under SFRA while others would be considered "Targeted" districts. However, the main difference with this expansion aid is that districts under SFRA were restricted to serve low-income children where now districts can educate all pre-school age children through PEEA. It appears that the Murphy administration may be moving towards a pre-school program for all children, rather than just for those who are low-income. The School District of the Chathams did not receive a PEEA grant in either the first or second round of funding and therefore has no bearing on the outcome of this study.

Projected PK-12 enrollments follow in Table 21. In the baseline and adjusted projections, enrollments are projected to decline throughout the projection period. Enrollment is projected to be 3,315 in 2026-27 in the baseline projections, which would be a decline of 417 students from the 2021-22 enrollment of 3,732. In the adjusted projections, enrollment is projected to be 3,430 in 2026-27, which would be a decline of 302 students from the 2021-22 enrollment.

Table 21
School District of the Chathams Projected Enrollments (PK-12)
2022-23 to 2026-27

Year	PK	K	1	2	3	4	5	6	7	8	9	10	11	12	SE[1]	Total
Baseline																
2022-23	42	187	237	235	224	252	280	266	279	311	290	301	287	326	76	**3,593**
2023-24	42	178	247	246	232	226	252	272	259	273	301	285	296	282	75	**3,466**
2024-25	42	198	234	256	244	234	226	242	265	253	264	296	281	291	74	**3,400**
2025-26	42	184	261	242	254	247	234	215	235	259	245	259	291	276	76	**3,320**
2026-27	42	241	241	272	240	257	247	226	209	230	250	241	255	286	78	**3,315**
Adjusted for Housing Growth																
2022-23	42	187	237	235	224	252	280	266	279	311	290	301	287	326	76	**3,593**
2023-24	42	182	251	249	236	229	254	277	263	276	304	287	299	285	75	**3,509**
2024-25	42	203	242	265	252	242	232	252	274	261	271	302	286	298	74	**3,496**
2025-26	42	189	268	252	265	256	243	228	246	269	253	267	298	282	76	**3,434**
2026-27	42	246	246	279	250	268	256	237	222	241	260	249	263	293	78	**3,430**

Note: [1]Self-contained special education enrollment/ungraded students

Projected Enrollments by Grade Configuration

In Table 22, projected enrollments are shown by grade configuration (PK-3, 4-5, 6-8, and 9-12) in the School District of the Chathams. Ungraded special education students were reassigned into each of the grade configurations.

For the elementary grades (PK-3), enrollments are projected to increase throughout the projection period in both the baseline and adjusted projections. In the baseline projections, enrollment is projected to be 1,080 in 2026-27, which would be a gain of 107 students from the 2021-22 enrollment of 973. In the adjusted projections, enrollment is projected to be 1,107 in 2026-27, which would be a gain of 134 students from the 2021-22 enrollment.

For grades 4-5 at Lafayette, enrollments are projected to decline for the next three years before reversing trend in both the baseline and adjusted projections. Enrollment is projected to be 525 in 2026-27 in the baseline projections, which would be a decline of 50 students from the 2021-22 enrollment of 575. In the adjusted projections, enrollment is projected to be 545 in 2026-27, which would be a decline of 30 students from the 2021-22 enrollment.

For grades 6-8 at Chatham Middle School, enrollments are projected to decline throughout the projection period in both the baseline and adjusted projections. In the baseline projections, enrollment is projected to be 674 in 2026-27, which would be a decline of 246 students from the 2021-22 enrollment of 920. In the adjusted projections, enrollment is projected to be 709 in 2026-27, which would be a decline of 211 students from the 2021-22 enrollment.

For grades 9-12 at Chatham High School, enrollments are also projected to decline throughout the projection period in both the baseline and adjusted projections. In the baseline projections, enrollment is projected to be 1,036 in 2026-27, which would be a decline of 228 students from the 2021-22 enrollment of 1,264. In the adjusted projections, enrollment is projected to be 1,069 in 2026-27, which would be a decline of 195 students from the 2021-22 enrollment.

Table 22
Projected Enrollments for Grades PK-3, 4-5, 6-8, and 9-12 for Each Projection Method

Historical	PK-3		4-5		6-8		9-12	
2021-22	973		575		920		1,264	
Projected	PK-3 Baseline	PK-3 Adjusted	4-5 Baseline	4-5 Adjusted	6-8 Baseline	6-8 Adjusted	9-12 Baseline	9-12 Adjusted
2022-23	963	963	554	554	868	868	1,208	1,208
2023-24	985	1,000	498	503	815	827	1,168	1,179
2024-25	1,015	1,045	479	493	770	797	1,136	1,161
2025-26	1,025	1,058	501	519	719	753	1,075	1,104
2026-27	1,080	1,107	525	545	674	709	1,036	1,069
5-year Change	+107	+134	-50	-30	-246	-211	-228	-195

Projections by Elementary School

Milton Avenue School

Historical enrollments for Milton Avenue from 2012-13 to 2021-22, and projected enrollments from 2022-23 to 2026-27, are shown in Table 23. Enrollments declined through 2018-19 before reversing trend. In 2021-22, enrollment is 295, which is a decline of 94 students from the 2012-13 enrollment of 389. In the baseline and adjusted projections, enrollments are projected to slowly increase throughout the projection period. In 2026-27, enrollment is projected to be 343 in the baseline projections, which would be a gain of 48 students from the 2021-22 enrollment. In the adjusted projections, enrollment is projected to be 347 in 2026-27, which is very similar to the baseline projections due to a limited number of children anticipated from the new housing units in the attendance area.

Table 23
Historical and Projected Enrollments of Milton Avenue School

Year	PK	K	1	2	3	SE[2]	Total
Historical[1]							
2012-13	39	71	88	84	101	6	**389**
2013-14	14	74	95	83	84	19	**369**
2014-15	14	68	79	103	83	16	**363**
2015-16	36	52	79	80	105	4	**356**
2016-17	31	49	67	74	81	6	**308**
2017-18	36	44	60	60	76	15	**291**
2018-19	43	47	52	60	57	15	**274**
2019-20	28	52	59	54	61	28	**282**
2020-21	45	48	52	59	54	26	**284**
2021-22	56	53	59	48	57	22	**295**
CSR 5-Yr. Ratios		1.1813[3]	1.2227[4]	0.9904	0.9832	0.0972[5]	
Projected – Baseline							
2022-23	42	47	65	58	47	25	**284**
2023-24	42	57	57	64	57	27	**304**
2024-25	42	51	70	56	63	27	**309**
2025-26	42	59	62	69	55	28	**315**
2026-27	42	70	72	61	68	30	**343**
Projected – Adjusted for Housing Growth							
2022-23	42	47	65	58	47	25	**284**
2023-24	42	57	57	64	57	27	**304**
2024-25	42	52	71	57	64	27	**313**
2025-26	42	60	63	70	56	28	**319**
2026-27	42	71	73	62	69	30	**347**

Notes: [1]Data were provided by the New Jersey Department of Education (http://www.nj.gov/education/data/enr/).
[2] Self-contained special education enrollment/ungraded students
[3] Birth-to-kindergarten survival ratio based on birth data five years prior
[4] Outlier survival ratio from 2020-21 was not used in the computation of the average ratio.
[5]Average proportion of self-contained special education/ungraded students with respect to PK-3 subtotals based on the last three years of historical data

Southern Boulevard School

Historical enrollments for Southern Boulevard from 2012-13 to 2021-22, and projected enrollments from 2022-23 to 2026-27, are shown in Table 24. Enrollments generally increased through 2017-18 before reversing trend. Enrollments have declined in each of the last four years. In 2021-22, enrollment is 379, which is a decline of 84 students from the 2012-13 enrollment of 463. In the baseline projections, enrollments are projected to decline for the next two years before reversing trend. In 2026-27, enrollment is projected to be 451, which would be a gain of 72 students from the 2021-22 enrollment. As there are a limited number of children anticipated from the new housing units in the attendance area, the baseline projections were not adjusted.

Table 24
Historical and Projected Enrollments of Southern Boulevard School

Year	PK	K	1	2	3	SE[2]	Total
Historical[1]							
2012-13	0	101	109	120	128	5	**463**
2013-14	0	68	132	116	125	10	**451**
2014-15	0	90	90	134	126	15	**455**
2015-16	0	79	125	99	143	18	**464**
2016-17	0	91	121	140	111	20	**483**
2017-18	0	87	129	124	148	11	**499**
2018-19	0	84	116	134	130	4	**468**
2019-20	0	46	118	128	132	10	**434**
2020-21	0	77	91	120	119	7	**414**
2021-22	0	58	97	102	116	6	**379**
CSR 5-Yr. Ratios		1.3157[3]	1.3539[4]	1.0700	0.9825	0.0176[5]	
Projected – Baseline							
2022-23	0	61	100	104	100	6	**371**
2023-24	0	67	83	107	102	6	**365**
2024-25	0	95	91	89	105	7	**387**
2025-26	0	76	129	97	87	7	**396**
2026-27	0	107	103	138	95	8	**451**

Notes: [1]Data were provided by the New Jersey Department of Education (http://www.nj.gov/education/data/enr/).
[2] Self-contained special education enrollment/ungraded students
[3] Birth-to-kindergarten survival ratio based on birth data five years prior with outlier ratio from 2019-20 removed
[4] Outlier survival ratio from 2020-21 was not used in the computation of the average ratio.
[5]Average proportion of self-contained special education/ungraded students with respect to PK-3 subtotals

Washington Avenue School

Historical enrollments for Washington Avenue from 2012-13 to 2021-22, and projected enrollments from 2022-23 to 2026-27, are shown in Table 25. Enrollments have been steadily declining over the last decade. In 2021-22, enrollment is 299, which is a decline of 145 students from the 2012-13 enrollment of 444. In the baseline and adjusted projections, enrollments are projected to slowly increase for the next three years before reversing trend. In 2026-27, enrollment is projected to be 286 in the baseline projections, which would be slightly lower (-13) than the 2021-22 enrollment. In the adjusted projections, enrollment is projected to be 309 in 2026-27, which would be slightly higher (+10) than the 2021-22 enrollment.

Table 25
Historical and Projected Enrollments of Washington Avenue School

Year	PK	K	1	2	3	SE[2]	Total
Historical[1]							
2012-13	12	92	110	109	104	17	**444**
2013-14	8	92	111	111	112	18	**452**
2014-15	7	79	115	109	106	16	**432**
2015-16	15	72	102	115	114	10	**428**
2016-17	14	62	96	104	115	6	**397**
2017-18	0	70	87	100	115	5	**377**
2018-19	0	51	100	85	107	6	**349**
2019-20	0	60	70	104	86	8	**328**
2020-21	0	52	75	78	101	8	**314**
2021-22	0	68	70	76	76	9	**299**
CSR 5-Yr. Ratios		1.0244[3]	1.3493	1.0362	1.0068	0.0226[4]	
Projected – Baseline							
2022-23	0	79	72	73	77	7	**308**
2023-24	0	54	107	75	73	7	**316**
2024-25	0	52	73	111	76	7	**319**
2025-26	0	49	70	76	112	7	**314**
2026-27	0	64	66	73	77	6	**286**
Projected – Adjusted for Housing Growth							
2022-23	0	79	72	73	77	7	**308**
2023-24	0	58	111	78	77	7	**331**
2024-25	0	56	80	119	83	7	**345**
2025-26	0	53	76	85	122	7	**343**
2026-27	0	68	70	79	86	6	**309**

Notes: [1]Data were provided by the New Jersey Department of Education (http://www.nj.gov/education/data/enr/).
[2] Self-contained special education enrollment/ungraded students
[3]Birth-to-kindergarten survival ratio based on birth data five years prior
[4]Average proportion of self-contained special education/ungraded students with respect to PK-3 subtotals

Capacity Analysis

Table 26 shows the educational capacities of the school buildings in the School District of the Chathams in comparison to both the current enrollments in 2021-22 and the enrollment projections in the 2026-27 school year. Since there were two sets of projections (baseline and adjusted for housing growth), only the adjusted projections are shown, as this reflects the full impact on the school district if all of the proposed housing is constructed and occupied. Using the building capacities from the school district, the differences between capacity and current/projected number of students were computed. Positive values indicate available extra seating while negative values indicate inadequate seating (also known as "unhoused students"). It should be noted that the capacity values are not fixed and can change from year-to-year based on classroom usage. For instance, additional special education classes in a building would reduce the building's capacity. On the other hand, districts with unhoused students can accommodate these children by increasing class sizes, which in turn increases the school's capacity.

In the elementary schools (PK-3), there is currently a surplus of seating in each school in 2021-22, with the largest being in Southern Boulevard (+106). Lafayette (4-5) also has surplus seating (+57). In the upper level schools, both Chatham Middle School (+32) and Chatham High School (+37) have surplus seating in 2021-22, but the surplus is the smallest of the district's six schools.

By 2026-27, each of the elementary schools is projected to have surplus seating, with the largest being at Washington Avenue (+73). Lafayette (+87) is projected to have a greater number of surplus seats in 2026-27. Due to a projected large decline in enrollment, Chatham Middle School (+243) and Chatham High School (+232) are projected to have a much greater number of surplus seats in 2026-27.

Table 26
Capacity Analysis
School District of the Chathams

School	Capacity[1,2]	Current Enrollment 2021-22	Difference	Projected Enrollment 2026-27	Difference
Milton Avenue School (PK-3)	375	295	**+80**	347	**+28**
Southern Boulevard School (K-3)	485	379	**+106**	451	**+34**
Washington Avenue School (K-3)	382	299	**+83**	309	**+73**
Lafayette School (4-5)	632	575	**+57**	545	**+87**
Chatham Middle School (6-8)	952	920	**+32**	709	**+243**
Chatham High School (9-12)	1,301	1,264	**+37**	1,069	**+232**

Notes: [1]Functional capacity as provided by the School District of the Chathams

[2] The actual capacities of the buildings in 2022 may have changed if the buildings' instructional spaces are being used differently than when the capacities were computed.

Housing Turnover Analysis

In a completely independent analysis, historical housing turnover rates by length of ownership in Chatham Borough and Chatham Township were used along with current student yields by length of ownership to project the number of students from 2022-2026, a five-year period. To accomplish this task, housing turnover rates of one- to four-family homes were analyzed. The majority of units were detached single-family homes or duplexes. Mixed-use properties (commercial and residential combined) were removed from the database, as well as townhouses/condominiums. Apartments were also excluded since the length of time a tenant occupies a residence cannot be determined. Age-restricted units were also excluded from this investigation. 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, and
3. student yields by length of ownership.

Turnover Rates

To compute turnover rates for one- to four-family homes, parcel-level data for Chatham Borough and Chatham Township were once again 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 1994[10], providing 27 years of historical sale data through 2021. Sales data for 2022 were incomplete and were excluded from the analysis.

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 that a house was built in 1980 and its three most recent sale dates in the database were 1999, 2005, and 2009. We cannot assume that the first length of ownership is 19 years since the house may have been sold prior to 1994, the earliest year sales were recorded. The first length of ownership is six years (1999 to 2005) whereby the home then becomes part of the 2005 cohort. After being sold four years later in 2009, the house becomes part of the 2009 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 Chatham Borough's and Chatham Township's 2003 cohort, 22 homes sold in the first year of ownership out of 360 homes, resulting in a turnover rate of 6.1%. An additional 27 homes were sold in the second year of ownership, resulting in a turnover rate of 7.5%. Turnover rates by length of ownership were computed and capped at 18 years for this cohort, since 2021 is the most recent year that sales data were available. Since the oldest sales were from 1994, computing turnover rates was possible on homes with lengths of ownership up to 27 years. Unfortunately, one of the drawbacks of the analysis was that sales data were not available prior to 1994, which prevented computation of turnover rates on long-held homes exceeding 27 years of ownership.

[10] While some sale dates were available prior to 1994, the data were incomplete and were not used.

In short, for each year from 1994-2021, there is a distribution of turnover rates by length of ownership. Obviously, there is not much information for homes with recent sale dates, such as 2018, since these homes may not have been sold again or would only have turnover rates by length of ownership of up to three years.

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 and mid-2000s, the turnover rate for the first year of ownership in Chatham Borough and Chatham Township ranged from 6-9%, 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 ranged from 3-4%, which is a much lower rate, as homeowners had difficulty selling their homes or fewer homeowners put their homes up for sale.

Figure 33 shows the distribution of turnover rates by length of ownership for one- to four-family homes in Chatham Borough and Chatham Township from 1994-2014. Although data were collected from 1994-2021, turnover rates for homes from 2015-2021 are not shown, as they would only have maximum lengths of ownership of six years or less. Figure 34 shows the distribution of turnover rates by length of ownership for one- to four-family homes using a 3-year moving average to smooth out unusual year-to-year variations in the turnover rates. 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, the 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 Chatham Borough and Chatham Township with one year of ownership (6.2%) before declining, as turnover rates are lowest for longer lengths of ownership. For homes with 13 or more years of ownership, average turnover rates were less than 2.0%. While it appears that turnover rates are rising at 24 or 27 years of ownership, this is misleading since there are very few homes at these lengths of ownership and one or two additional sales had a great impact on the turnover rate. Based on our experience with school districts that had 35-40 years of sales data available to compute lengths of ownership, turnover rates remain low, or decline further, at the longest lengths of ownership.

One of the central tenets of the housing turnover analysis is to better understand the relationship between residents aging in place and student yields. While most of the homes are owner-occupied, some are likely occupied by renters. In our analysis, the property address and the owner's address matched for 94.0% of the housing units, which are likely owner-occupied. For the remaining units (6.0%) that are likely occupied by renters, they are included in the study as the analysis captures the turnover rates of all properties since 1994, irrespective of ownership.

Figure 33
Chatham Borough and Chatham Township
Historical Turnover Rates by Length of Ownership
One- to Four-Family Homes
1994-2014

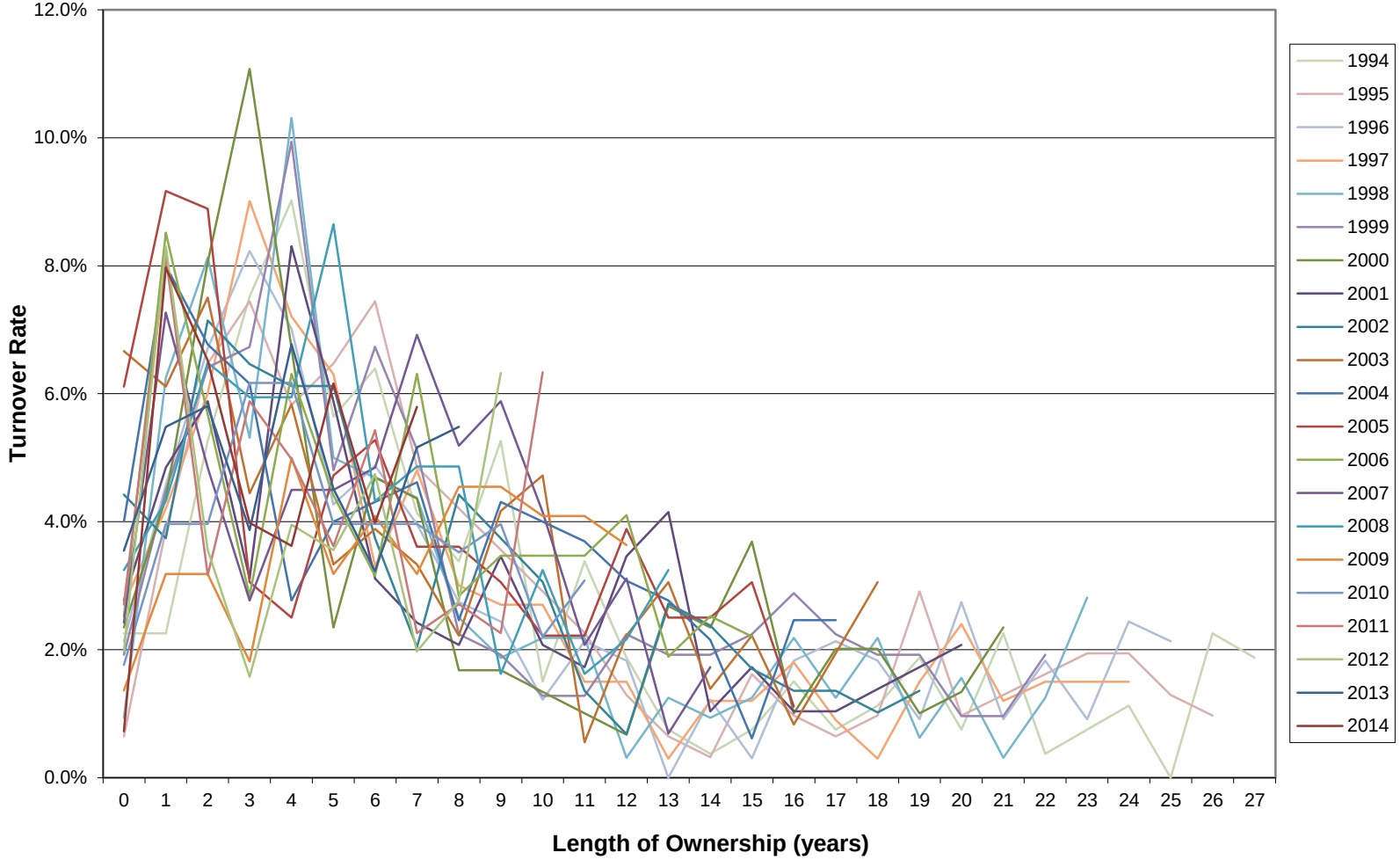


Figure 34
Chatham Borough and Chatham Township Turnover Rates by Length of Ownership
3-Year Moving Average
One- to Four-Family Homes
1996-2014

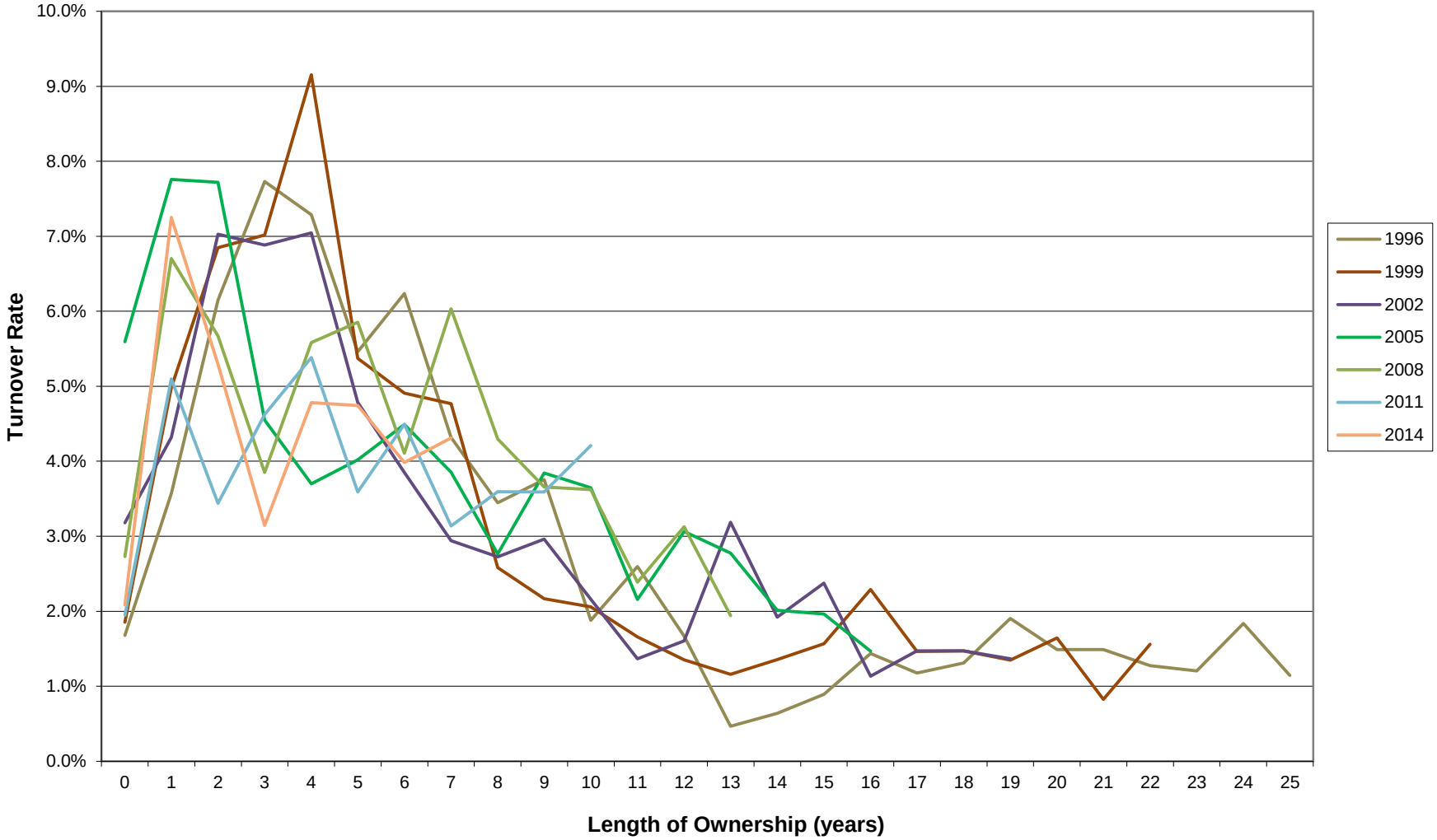
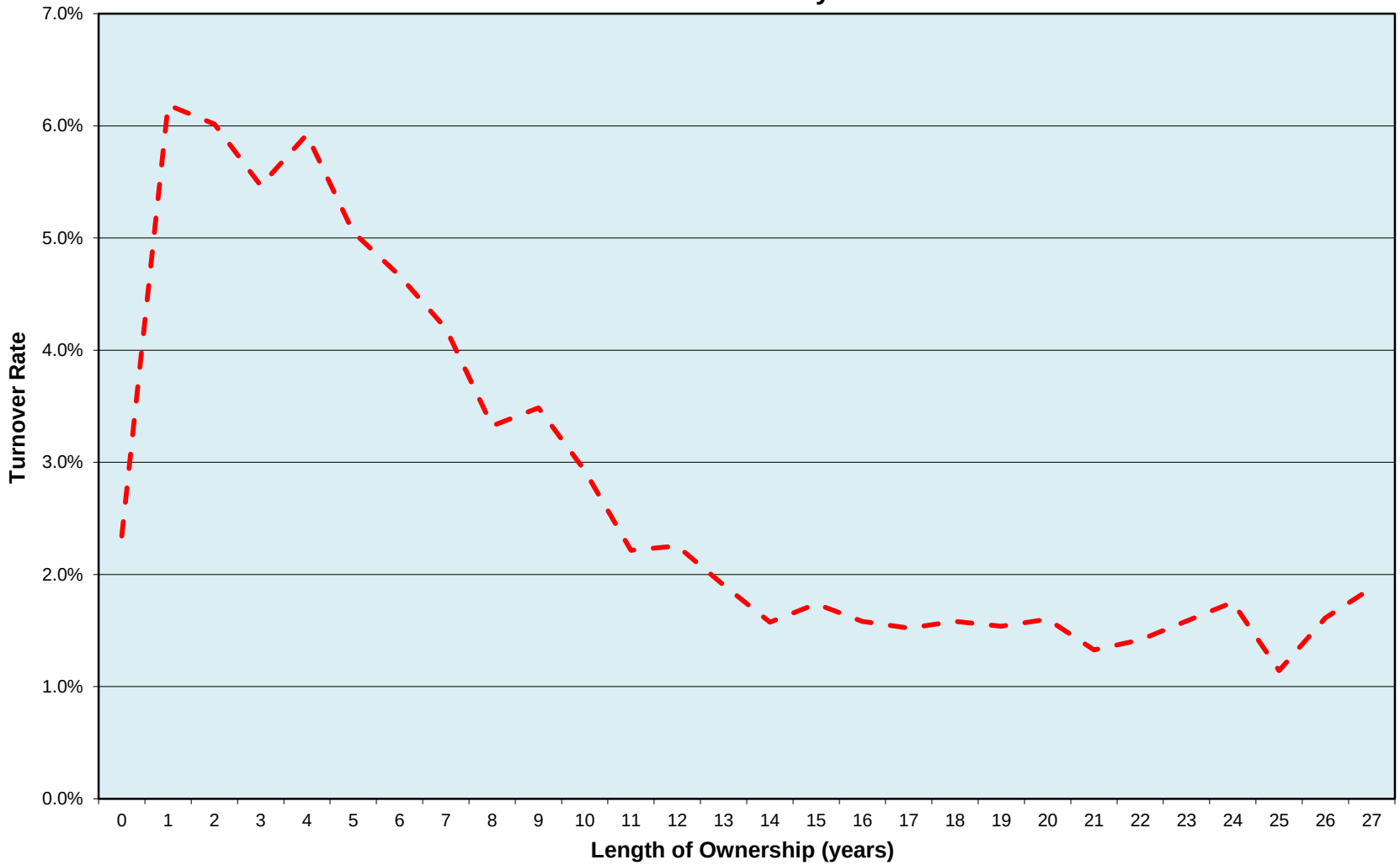


Figure 35
Historical Weighted-Average of Chatham Borough and Chatham Township Turnover Rates by Length of Ownership One- to Four-Family Homes



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 2021. "Paper sales" were once again excluded and the next most recent sale date was used instead. Table 27 and Figure 36 show the current length of ownership distribution for one- to four-family homes in Chatham Borough and Chatham Township. Since some homes did not have a sale date, they have been owned at least 27 years, as the oldest sale dates were from 1994. The greatest number of homes occurs at one year of ownership. The number of homes then declines through 13 years of ownership before stabilizing. A total of 1,372 homes (25.6%) have never been sold, which is a relatively large percentage of the housing population, and therefore have been owned more than 27 years. This is not shown in the figure, as it would skew the end of the distribution.

Student Yields by Length of Ownership

The third variable, student yields by length of ownership, was determined by joining the Chatham Borough and Chatham Township parcel-level property databases with 2021-22 student address data, which was provided by the school district. Table 27 and Figure 37 show the student yields by length of ownership for one- to four-family homes, which are reproduced from earlier in the report. It is expected that longer-held homes will have fewer children, as they would have graduated from the district. In 2021-22, there were 3,748 students in the School District of the Chathams database[11]. Of this number, we were able to match 3,388 Chatham Borough and Chatham Township resident students[12] to an address in the Chatham Borough and Chatham Township property databases. Additional children lived either in apartments (n = 99), townhouses/condominiums (n = 87), or were unmatched (n = 88). Some of the unmatched students lived in mixed-use units, had no physical address (just a P.O. box was listed), or lived outside of Chatham Borough or Chatham Township.

Figure 37 shows that student yields increase with length of ownership, peaking at 1.29 children per housing unit with eight (8) years of ownership. Student yields then begin to decline as length of ownership increases. For homes with 22 or more years of ownership, student yields were below 0.30. For homes with 28 or more years of ownership, the student yield was 0.18, which is very low.

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 2021-22 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 communities 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.

[11] This is slightly higher than the 3,732 students reported to the state through NJ SMART.
[12] 86 pre-kindergarten students were excluded.

Table 27
Chatham Township and Chatham Borough Student Yields (K-12)
by Current Length of Ownership
One- to Four-Family Homes

Years of Ownership	Housing Units	Students 2021-22	Student Yield
0	208	79	0.38
1	415	223	0.54
2	189	136	0.72
3	234	184	0.79
4	227	214	0.94
5	218	228	1.05
6	191	224	1.17
7	169	215	1.27
8	174	224	1.29
9	155	194	1.25
10	116	144	1.24
11	121	143	1.18
12	119	135	1.13
13	73	88	1.21
14	113	114	1.01
15	115	93	0.81
16	117	79	0.68
17	102	79	0.77
18	117	71	0.61
19	103	78	0.76
20	106	63	0.59
21	93	37	0.40
22	81	20	0.25
23	97	17	0.18
24	99	26	0.26
25	94	22	0.23
26	76	11	0.14
27	68	4	0.06
28+	1,372	243	0.18
Total	**5,362**	**3,388**	**0.632**

Figure 36
Chatham Borough and Chatham Township
Current Number of One- to Four-Family Homes
by Length of Ownership

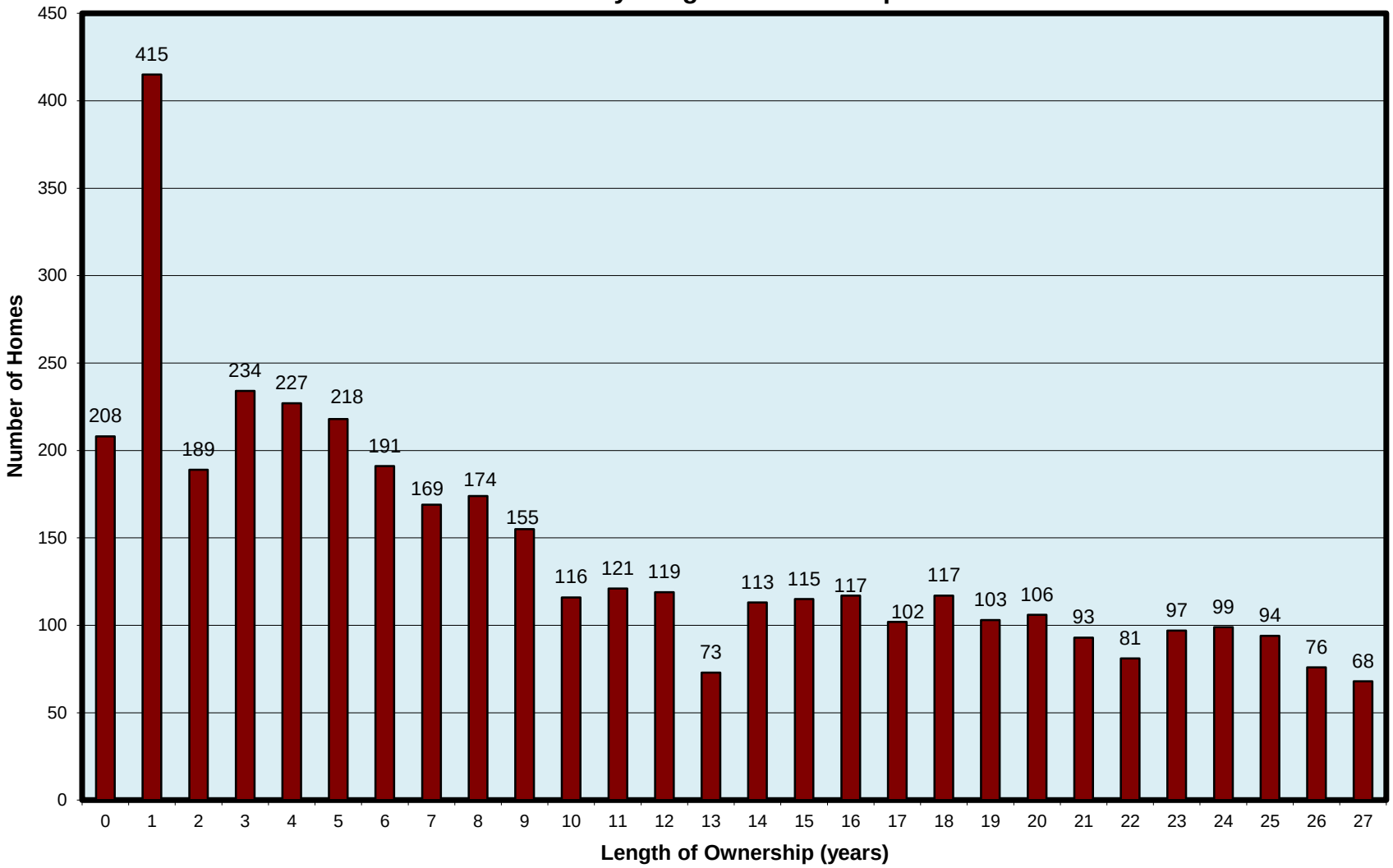
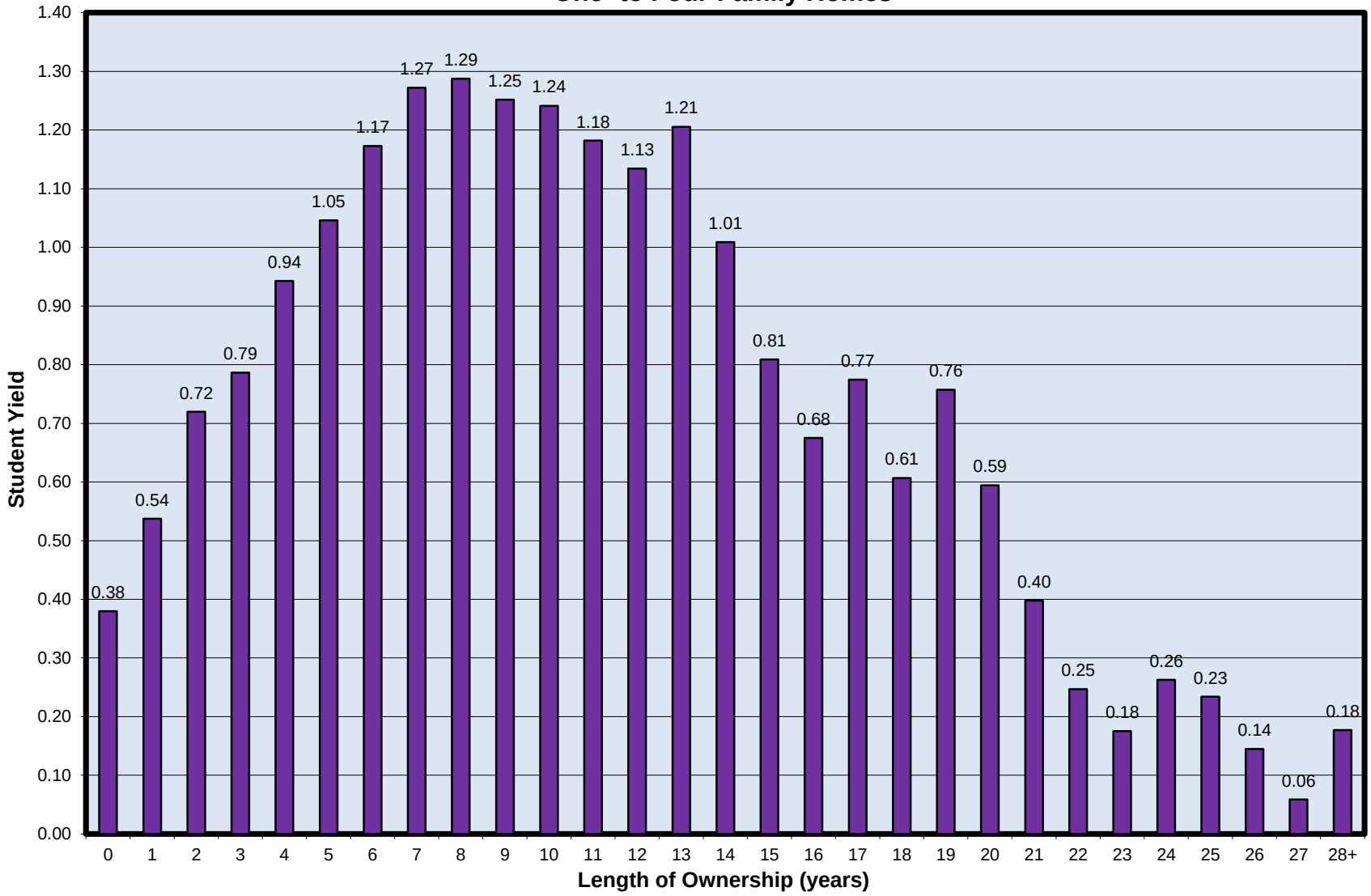


Figure 37
Chatham Borough and Chatham Township Student Yields by Length of Ownership
One- to Four-Family Homes



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[13], 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. In the forthcoming section, this process of aging homes based on historical turnover rates was completed for a five-year period.

Table 28 shows the process in greater detail. The Chatham Borough and Chatham Township historical average turnover rates by length of ownership for one- to four-family homes 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 2022, 163 from Column D, becomes the number of homes with zero years of ownership in the following year. However, if the average turnover rates are used in this analysis, the predicted annual number of home sales (163 as shown in the table) would be much lower than the current number of homes with zero years of ownership (n = 208), which reflects the number of one- to four-family homes sold in 2021. The average turnover rates reflect home selling patterns from an older historical period that may not be reflective of the current housing market.

Scenario 1

In the first scenario, the average turnover rate at each length of ownership from each of the last 27 years was used to project the number of future homes. In addition, one of the key variables affecting future enrollments in the housing turnover model is the number of long-held homes (28 or more years). As shown previously, the student yield for homes with 28 or more years of ownership is very low (0.18). 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 28 or more years of ownership. Therefore, the turnover rate for homes with 28 or more years of ownership was increased to 5.4%. The higher turnover rate also simulates a greater percentage of baby boomers/empty nesters selling their homes than experienced currently.

[13]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.

Table 28
Sample of Process in Forecasting Length of Ownership

A	B	C	D	E	F
Years of Ownership	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	2.3%	208	5		**163**
1	6.2%	415	26	203	203
2	6.0%	189	11	389	389
3	5.5%	234	13	178	178
4	5.9%	227	13	221	221
5	5.1%	218	11	214	214
6	4.7%	191	9	207	207
7	4.2%	169	7	182	182
8	3.3%	174	6	162	162
9	3.5%	155	5	168	168
10	2.9%	116	3	150	150
11	2.2%	121	3	113	113
12	2.3%	119	3	118	118
13	1.9%	73	1	116	116
14	1.6%	113	2	72	72
15	1.7%	115	2	111	111
16	1.6%	117	2	113	113
17	1.5%	102	2	115	115
18	1.6%	117	2	100	100
19	1.5%	103	2	115	115
20	1.6%	106	2	101	101
21	1.3%	93	1	104	104
22	1.4%	81	1	92	92
23	1.6%	97	2	80	80
24	1.8%	99	2	95	95
25	1.1%	94	1	97	97
26	1.6%	76	1	93	93
27	1.9%	68	1	75	75
28 and up	1.7%[1]	1372	24	1415	1415
Total		**5,362**	**163**		**5,362**

Note: [1]Homes not sold since 1994 were assumed to have a future turnover rate of 1.7%.

Table 29 shows the projected number of homes by length of ownership for one- to four-family homes in Chatham Borough and Chatham Township for 2022-2026 using the method described above, assuming that the turnover rates presented in the table will continue into the future. Increasing the turnover rate for homes with 28 or more years of ownership has the added effect of raising the number of sales to current levels. In this scenario, the predicted annual number of home sales ranges from 205-213 (homes with zero years of ownership), which is comparable to the number of sales that occurred in 2021 (208).

Table 29
Projected Number of Chatham Borough and Chatham Township One- to Four-Family Homes by Length of Ownership Scenario 1

Years of Ownership	Average Turnover Rate	Turnover Rate Used	2021 (Actual)	2022	2023	2024	2025	2026
0	2.3%	2.3%	208	213	212	206	207	205
1	6.2%	6.2%	415	203	208	207	201	202
2	6.0%	6.0%	189	389	190	195	194	189
3	5.5%	5.5%	234	178	366	179	183	182
4	5.9%	5.9%	227	221	168	346	169	173
5	5.1%	5.1%	218	214	208	158	326	159
6	4.7%	4.7%	191	207	203	197	150	310
7	4.2%	4.2%	169	182	197	194	188	143
8	3.3%	3.3%	174	162	174	189	186	180
9	3.5%	3.5%	155	168	157	168	183	180
10	2.9%	2.9%	116	150	162	152	162	177
11	2.2%	2.2%	121	113	146	157	148	157
12	2.3%	2.3%	119	118	110	143	154	145
13	1.9%	1.9%	73	116	115	108	140	151
14	1.6%	1.6%	113	72	114	113	106	137
15	1.7%	1.7%	115	111	71	112	111	104
16	1.6%	1.6%	117	113	109	70	110	109
17	1.5%	1.5%	102	115	111	107	69	108
18	1.6%	1.6%	117	100	113	109	105	68
19	1.5%	1.5%	103	115	98	111	107	103
20	1.6%	1.6%	106	101	113	96	109	105
21	1.3%	1.3%	93	104	99	111	94	107
22	1.4%	1.4%	81	92	103	98	110	93
23	1.6%	1.6%	97	80	91	102	97	108
24	1.8%	1.8%	99	95	79	90	100	95
25	1.1%	1.1%	94	97	93	78	88	98
26	1.6%	1.6%	76	93	96	92	77	87
27	1.9%	1.9%	68	75	91	94	91	76
28 and up	1.7%	5.4%	1372	1365	1365	1380	1397	1411
Total			**5,362**	**5,362**	**5,362**	**5,362**	**5,362**	**5,362**

Table 30 shows the projected number of Chatham Borough and Chatham Township students by length of ownership for one- to four-family homes from 2022-2026. This was computed by multiplying the projected number of homes by length of ownership with the student yields by length of ownership. After summing the projected number of students at each length of ownership, the output is the total number of students residing in one- to four-family homes in each year. These values are then added to the number of resident students living in townhouses/condominiums, apartments, or mixed-use units, those who had no address, lived out of town, or were unmatched. These values were assumed to remain constant throughout the projection period. In addition, as this analysis was only completed for grades K-12, the number of Chatham Borough and Chatham Township pre-kindergarten students from 2021-22 (86) was also added to the resident student totals and assumed to remain constant throughout the projection period. As the table shows, the total number of students is projected to slowly increase in the next five years. Enrollment is projected to be 3,871 in 2026, which would be a gain of 123 students from the 2021-22 enrollment of 3,748, with the assumption that the turnover rate of long-held homes (28 or more years) would be much higher than experienced historically.

Table 30
Projected Number of Chatham Borough and Chatham Township Students Based on Length of Ownership and Student Yields
Scenario 1

Years of Ownership	Student Yield	2022	2023	2024	2025	2026
0	0.38	81	81	78	79	78
1	0.54	109	112	111	108	109
2	0.72	280	137	140	140	136
3	0.79	140	288	141	144	143
4	0.94	208	158	326	159	163
5	1.05	224	218	165	341	166
6	1.17	243	238	231	176	364
7	1.27	232	251	247	239	182
8	1.29	209	224	243	239	232
9	1.25	210	197	210	229	225
10	1.24	186	201	189	201	220
11	1.18	134	173	186	175	186
12	1.13	134	125	162	175	164
13	1.21	140	139	130	169	182
14	1.01	73	115	114	107	138
15	0.81	90	57	91	90	84
16	0.68	76	74	47	74	74
17	0.77	89	86	83	53	84
18	0.61	61	69	66	64	41
19	0.76	87	74	84	81	78
20	0.59	60	67	57	65	62
21	0.40	41	39	44	37	43
22	0.25	23	25	24	27	23
23	0.18	14	16	18	17	19
24	0.26	25	21	24	26	25
25	0.23	23	22	18	21	23
26	0.14	13	14	13	11	13
27	0.06	4	5	6	5	4
28 and up	0.18	242	242	244	247	250
Students from One- to Four-Family Homes		3,451	3,468	3,492	3,499	3,511
Students from Townhouses, Condos, Apartments, Mixed-use units, no address, lived out of town, or unmatched (constant)		274	274	274	274	274
Chatham Borough and Chatham Township Pre-Kindergarten students (constant)		86	86	86	86	86
Total		**3,811**	**3,828**	**3,852**	**3,859**	**3,871**

Scenario 2

In the first scenario, the average turnover rates utilized likely reflect home selling patterns from an older historical period that may not be reflective of the current housing market. Figure 38 shows the minimum, maximum, and average turnover rates by length of ownership in Chatham Borough and Chatham Township for the last 27 years. While it is not likely that Chatham Borough and Chatham Township will experience the maximum historical turnover rates at each length of ownership simultaneously going forward, it is likely to experience turnover rates in between the average and maximum values. Figure 38 also shows a modified turnover rate, which reflects an increase of the historical average turnover rate by a constant (125% of the average turnover rate) so that each turnover rate is above the historical average turnover rate, yet is below the historical maximum turnover rate. In the second scenario, the modified turnover rates were used to project the number of homes by length of ownership, which is shown in Table 31. In addition, for homes with 27 or more years of ownership, the turnover rate was changed to 3.0%, which is lower than in the previous scenario. In this scenario, the predicted annual number of home sales ranges from 199-211, which is comparable to the number of sales that occurred in 2021 (208).

Figure 38
Chatham Borough and Chatham Township
Historical Housing Turnover Rates in
One- to Four-Family Homes
1994-2021

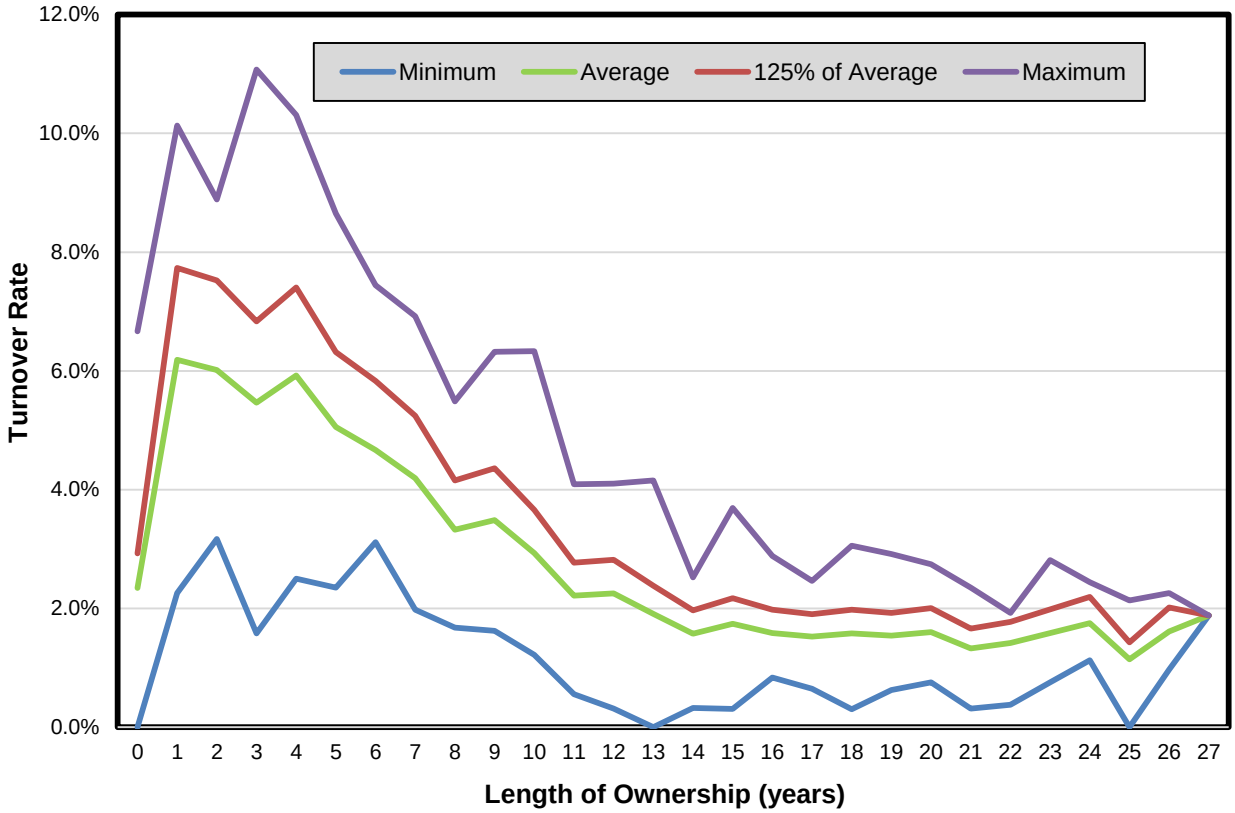


Table 31
Projected Number of Chatham Borough and Chatham Township One- to Four-Family Homes by Length of Ownership Scenario 2

Years of Ownership	Average Turnover Rate	Turnover Rate Used	2021 (Actual)	2022	2023	2024	2025	2026
0	2.3%	2.9%	208	211	208	206	204	199
1	6.2%	7.7%	415	202	205	202	200	198
2	6.0%	7.5%	189	383	186	189	186	185
3	5.5%	6.8%	234	175	354	172	175	172
4	5.9%	7.4%	227	218	163	330	160	163
5	5.1%	6.3%	218	210	202	151	306	148
6	4.7%	5.8%	191	204	197	189	141	287
7	4.2%	5.2%	169	180	192	186	178	133
8	3.3%	4.2%	174	160	171	182	176	169
9	3.5%	4.4%	155	167	153	164	174	169
10	2.9%	3.7%	116	148	160	146	157	166
11	2.2%	2.8%	121	112	143	154	141	151
12	2.3%	2.8%	119	118	109	139	150	137
13	1.9%	2.4%	73	116	115	106	135	146
14	1.6%	2.0%	113	71	113	112	103	132
15	1.7%	2.2%	115	111	70	111	110	101
16	1.6%	2.0%	117	113	109	68	109	108
17	1.5%	1.9%	102	115	111	107	67	107
18	1.6%	2.0%	117	100	113	109	105	66
19	1.5%	1.9%	103	115	98	111	107	103
20	1.6%	2.0%	106	101	113	96	109	105
21	1.3%	1.7%	93	104	99	111	94	107
22	1.4%	1.8%	81	91	102	97	109	92
23	1.6%	2.0%	97	80	89	100	95	107
24	1.8%	2.2%	99	95	78	87	98	93
25	1.1%	1.4%	94	97	93	76	85	96
26	1.6%	2.0%	76	93	96	92	75	84
27	1.9%	1.9%	68	74	91	94	90	73
28 and up	1.7%	3.0%	1372	1398	1429	1475	1523	1565
Total			**5,362**	**5,362**	**5,362**	**5,362**	**5,362**	**5,362**

Table 32 shows the projected number of Chatham Borough and Chatham Township students by length of ownership from 2022-2026. Unlike the prior scenario, enrollments are projected to increase in 2022 before reversing trend. Enrollment is projected to be 3,745 in 2026, which would be nearly identical to the 2021-22 enrollment (3,748), with the assumption that the turnover rates of long-held homes (28 or more years) would be slightly higher than that experienced historically.

Table 32
Projected Number of Chatham Borough and Chatham Township Students Based on Length of Ownership and Student Yields Scenario 2

Years of Ownership	Student Yield	2022	2023	2024	2025	2026
0	0.38	80	79	78	77	76
1	0.54	109	110	109	107	106
2	0.72	276	134	136	134	133
3	0.79	138	278	135	138	135
4	0.94	206	154	311	151	154
5	1.05	220	211	158	320	155
6	1.17	239	231	222	165	337
7	1.27	229	244	237	226	169
8	1.29	206	220	234	227	218
9	1.25	209	191	205	218	212
10	1.24	184	199	181	195	206
11	1.18	132	169	182	167	178
12	1.13	134	124	158	170	155
13	1.21	140	139	128	163	176
14	1.01	72	114	113	104	133
15	0.81	90	57	90	89	82
16	0.68	76	74	46	74	73
17	0.77	89	86	83	52	83
18	0.61	61	69	66	64	40
19	0.76	87	74	84	81	78
20	0.59	60	67	57	65	62
21	0.40	41	39	44	37	43
22	0.25	22	25	24	27	23
23	0.18	14	16	18	17	19
24	0.26	25	20	23	26	24
25	0.23	23	22	18	20	22
26	0.14	13	14	13	11	12
27	0.06	4	5	6	5	4
28 and up	0.18	248	253	261	270	277
Students from One- to Four-Family Homes		3,427	3,418	3,420	3,400	3,385
Students from Townhouses, Condos, Apartments, Mixed-use units, no address, lived out of town, or unmatched (constant)		274	274	274	274	274
Chatham Borough and Chatham Township Pre-Kindergarten students (constant)		86	86	86	86	86
Total		**3,787**	**3,778**	**3,780**	**3,760**	**3,745**

In comparing the projections from both scenarios, the enrollments in Scenario 2 are more plausible as it reflects turnovers rates that are more likely to occur in the next five years as opposed to historical averages, which reflect a period with lower turnover rates. In addition, the turnover rate used for homes owned 28 or more years in Scenario 2 (3.0%) is more realistic than the one used in Scenario 1 (5.4%).

The results in Tables 30 and 32 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 the five-year projection period. Figure 36 showed the variability in the turnover rates with length of ownership.

It should be clearly stated that the purpose of this analysis is not 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 the second scenario, which is more plausible, it appears enrollments are not likely to change significantly due to housing turnover, controlling for all other factors, such as fertility rates, births, inward migration, or new residential construction.