



Demographic Study Update

for the

**West Windsor-Plainsboro
Regional School District**

March 2018

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Executive Summary

Statistical Forecasting LLC (“Statistical Forecasting”) completed a demographic study for the West Windsor-Plainsboro Regional School District, projecting grade-by-grade enrollments from 2018-19 through 2022-23, a five-year period. In addition, the following tasks were completed:

- analyzed community population trends and age structure, birth and fertility rates, and new housing starts
- computed student yields by property type
- projected enrollments based on student yields and housing turnover rates (resales) in West Windsor and Plainsboro Townships in a totally independent analysis.

Community Overviews

In West Windsor Township (“West Windsor”), the population nearly quadrupled in size from 1940 to 1980 as it grew from 2,160 to 8,542. West Windsor has continued to grow at a rapid rate, as its population more than tripled in size from 1980-2010. In 2010, West Windsor had 27,165 residents and forecasts project the population to increase to 29,279, which would be a 7.8% increase from the 2010 population and a gain of more than 2,000 persons.

In Plainsboro Township (“Plainsboro”), there were 22,999 residents in 2010. Plainsboro’s greatest growth occurred in the 1970s when the population more than tripled in size. Significant growth continued in the 1980s when the population more than doubled in size. In recent decades, growth has slowed in comparison, but is still quite substantial. Forecasts project the population to be 24,927, which would be an 8.4% increase from the 2010 population and a gain of nearly 2,000 persons.

Regarding race, while Whites are the largest race in West Windsor, their population has declined rather significantly from 2000 to 2010. In 2010, the township was 54.9% White as compared to 71.5% in 2000, a loss of 16.6 percentage points. Asians were the second-largest race at 37.7% in 2010, which is an increase of 14.9 percentage points from 2000.

In Plainsboro, Asians were the largest race at 46.2% in 2010, which is a 15.7 percentage-point gain from 2000. Whites are the second-largest race and accounted for 41.1% of the population in 2010, which is a decline of 17.1 percentage points from the 2000 percentage (58.2%).

With respect to nativity, 39.5% of West Windsor residents and 48.0% of Plainsboro residents are foreign-born, which are much greater than that of New Jersey (21.8%). India is the largest source in both communities, accounting for 43.0% of the foreign-born population in West Windsor and 55.8% in Plainsboro.

Historical Enrollment Trends

Historical enrollments were analyzed from 2008-09 through 2017-18, a 10-year period. After peaking at 9,801 students in 2009-10, total enrollment (PK-12) declined through 2015-16

before reversing trend. In 2017-18, enrollment is 9,678, which is a loss of 123 students from the 2009-10 peak enrollment.

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, 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. The district has experienced negative first grade replacement in each of the last nine years, which is when the number of graduating twelfth grade students is larger than the number of first grade students replacing them in the next year. In the last five years, the district has lost an average of 122 students per year due to first grade replacement.

Most of the district's losses due to negative first grade replacement were partially offset (or totally, resulting in a net enrollment gain) by a net inward migration of students in the other grades (K to 1, 1 to 2, 2 to 3, etc.). Eight of the thirteen average survival ratios in the five-year trend were above 1.000, indicating net inward migration.

Birth Counts

The number of births in West Windsor and Plainsboro was used to project kindergarten enrollments. The number of births has been slowly declining in both communities. In West Windsor, the number of births was fairly stable from 2003-2009, ranging from 241-278, before declining to 204 in 2016. In Plainsboro, the number of births peaked at 322 in 2007 before declining to 248 in 2016. Combining the data from the two communities, the number of births was fairly stable from 2002-2009, ranging from 536-585 births per year. However, in 2016, the combined birth count was 452, which is 127 fewer births than seven years prior. As a result, kindergarten enrollment has declined from a high of 608 in 2008-09 to a low of 509 in 2016-17, which is not as large as the decline in the birth count. The inward migration of families with children under the age of five has reduced the potential impact of the declining birth count on the kindergarten enrollment.

In comparing births from both 2003 and 2016 at the elementary attendance area level, the number of births was greatest in the Maurice Hawk attendance area in West Windsor and the Town Center attendance area in Plainsboro. In both communities, births have been declining in their respective attendance areas with the largest decline occurring in the Dutch Neck attendance area.

In addition, births by elementary attendance area were projected for 2017 using an average, as these children will become the kindergarten class of 2022. It should be clearly stated the projected number of births does not account for future pending residential developments in West Windsor or Plainsboro, nor does it account for the additional 1,500 affordable housing units that West Windsor is required to build by 2025. Birth counts and birth-to-kindergarten survival ratios are likely to increase with new residential developments (as more families are likely to move in with children under the age of five), but there is no way of projecting what the impact will be.

The 2000 and 2010 age-sex diagrams for West Windsor and Plainsboro were created to show the percentage of males and females in each age class. In 2000, the largest cohort in West Windsor was aged 40-44 for both males and females. In Plainsboro, the largest cohort was aged 30-34 for males and 25-29 for females, which is much younger than the largest cohort in West Windsor. In 2010, the largest cohort in West Windsor was aged 45-49 for both genders while the largest cohorts in Plainsboro were aged 45-49 for males and 25-29 for females. From 2000 to 2010, the greatest numerical loss in West Windsor occurred in the 40-44 age group for both genders while the greatest numerical loss in Plainsboro occurred in the 30-34 age group for males and 35-39 age group for females. In each community, the greatest gain occurred in the 50-54 age group for males and the 60-64 age group for females.

Potential New Housing

In West Windsor, there is the potential for 664 non age-restricted housing units. Of the proposed new housing, the largest development is Woodstone at Princeton, which would consist of a mix of 443 market-rate and affordable apartment units on Canal Pointe Boulevard.

In March 2018, the Mercer County Superior Court judge ruled that West Windsor is required to build 1,500 affordable housing units by 2025. Due to the uncertainty of how the township will specifically meet its obligation and the timeline to do so, this ruling was not considered in the impact of new housing on the enrollment projections.

In Plainsboro, there is the potential for 498 non age-restricted housing units. The largest development, Princeton Forrestal Village, would consist of 344 market-rate and 50 affordable apartment units, totaling 394 units.

In total, 566 public school children in grades K-12 are projected to come from the new housing developments in the two communities.

Student Yields

Student yields by length of ownership for detached single-family homes was determined by linking each community's parcel-level property database with the 2016-17 student address data. Student yields in West Windsor slowly increase with length of ownership, peaking at 1.29 children per housing unit with eight (8) years of ownership. In West Windsor, the average student yield for detached single-family homes was computed to be 1.13. In Plainsboro, student yields slowly increase with length of ownership, peaking at 1.37 children per housing unit with four (4) years of ownership. The average student yield for detached single-family homes was computed to be 1.23 in Plainsboro, which is slightly higher than West Windsor.

Student yields were also computed for townhouses/condominiums. In West Windsor, the average student yield is 0.51 children per unit. Student yields were largest in Estates at Princeton Junction (0.85) and Windsor Ponds (0.80), which are newer developments. The average student yield in Plainsboro is 0.56 children per unit, which is very similar to the student yield in West Windsor. In Plainsboro, student yields were largest in Brittany (0.87) and Hampshire (0.84).

Finally, student yields were computed for apartment complexes. In West Windsor, most of the apartment complexes are a mix of market-rate and affordable housing consisting of 1-3 bedrooms per unit. The average student yield in West Windsor is 0.53 children per unit. In Plainsboro, most of the apartment units are market-rate. Student yields in Plainsboro are lower than West Windsor, averaging 0.25 children per unit.

Home Sales

In West Windsor, after having 515 home sales in 2004, the number of sales declined to 312 in 2011 due to the housing market crash and banking crisis. Since then, home sales have rebounded and have ranged from 383-388 in the last three years, yet are far below the peak number of sales that occurred in 2004. In Plainsboro, after peaking at 480 home sales in 2005, the number of sales declined to 223 in 2011. Since then, home sales have slowly increased and have ranged from 302-351 in the last four years, yet are far below the peak number of sales that occurred in 2005.

Enrollment Projections

Enrollment projections, adjusted for new housing, were calculated at the school level and were computed for each grade from the 2018-19 school year through the 2022-23 school year, a five-year period. The projections were completed for a five-year period rather than ten years as a five-year projection is much more reliable. Since birth data are used to project kindergarten students five years later, the ten-year projection in years 6-10 relies on estimated birth counts in order to project the number of kindergarten students. For this reason, elementary projections are much more susceptible to higher error rates in a ten-year projection as compared to middle or high school projections, which rely on either children that have already been born or that are currently enrolled in the district. In addition, it should be noted that the future projections do not take into account the additional 1,500 affordable housing units that West Windsor will be required to build by 2025. Due to the uncertainty of how the township will specifically meet its obligation and the timeline to do so, and the difficulty in reliably projecting future births in small municipalities such as Plainsboro and West Windsor, this report does not project enrollments beyond five years.

In 2022-23, total enrollment (PK-12) is projected to be 10,012, which would be a gain of 334 students from the 2017-18 enrollment of 9,678.

At the elementary level containing grades PK-5, enrollment is projected to decline, in general, throughout the projection period. In 2022-23, enrollment is projected to be 4,080, which would represent a loss of 141 students from the 2017-18 enrollment of 4,221.

For grades 6-8, enrollment is projected to increase through 2021-22 before reversing trend. Enrollment is projected to be 2,591 in 2022-23, which would represent a gain of 155 students from the 2017-18 enrollment of 2,436.

For grades 9-12, enrollment is projected to increase throughout the projection period. In 2022-23, enrollment is projected to be 3,341, which would be a gain of 320 students from the 2017-18 enrollment of 3,021.

Housing Turnover

Using historical housing turnover rates by length of ownership in West Windsor and Plainsboro along with current student yields by length of ownership, the number of PK-12 students was projected from 2017-2021 in a completely independent analysis. To accomplish this task, 8,030 housing units in West Windsor and 5,491 housing units in Plainsboro designated as Class 2 properties (1- to 4-family homes) were analyzed. Since West Windsor and Plainsboro each have their own unique housing market, this analysis was performed separately for each community. To complete this analysis, three inputs were needed:

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

To compute turnover rates, home sales were obtained from 1978-2016, a period of 38 years. Turnover rates in West Windsor were greatest at three years of ownership before declining while turnover rates in Plainsboro were greatest at 21 years of ownership.

A scenario based on historical and hypothetical turnover rates was created to demonstrate the potential impact on enrollment in the district. In this scenario, the total number of students is projected to decline over the five-year projection period and be 9,319 in 2021-22. In summary, enrollment is not likely to grow significantly due to housing turnover; other factors, such as higher fertility rates or new residential construction, would lead to enrollment growth.

Final Thoughts

Total enrollments are projected to increase for the next four years before reversing trend in the West Windsor-Plainsboro Regional School District. The declining birth rate in each township has resulted in smaller kindergarten cohorts entering the school district. In the short term, the elementary cohorts will decline as the smaller kindergarten grades enter the school district. Eventually, as the elementary cohorts advance into the middle and high schools, enrollments will decrease in those configurations as well. **However, if larger pending residential developments in West Windsor are approved, in addition to being required to build 1,500 affordable housing units, the district's enrollment is instead likely to increase at all grade configuration levels.** Besides having a direct impact on the K-12 population with additional children from the new housing, the new units are likely to lead to an increase in births and children under the age of five, which could have a significant impact, particularly on the elementary schools.

Introduction

Statistical Forecasting LLC (“Statistical Forecasting”) completed a demographic study for the West Windsor-Plainsboro Regional School District (“West Windsor-Plainsboro Regional”), projecting grade-by-grade enrollments from 2018-19 through 2022-23, a five-year period. Prior to this report, Statistical Forecasting most recently completed a demographic study for the school district in January 2013. In addition, the following tasks were completed:

- analyzed community population trends and age structure, birth and fertility rates, and new housing starts
- computed student yields by property type
- projected enrollments based on student yields and housing turnover rates (resales) in West Windsor and Plainsboro Townships in a totally independent analysis.

Enrollment Projections from January 2013 Report

In our previous demographic study completed in January 2013, enrollments were projected from 2012-13 through 2021-22, a ten-year period. Table 1 below compares the actual enrollments (PK-12) to the projected enrollments for the first six years of the projection period. Positive error rates indicate over-projections while negative error rates indicate under-projections.

Table 1
Comparison of Projected to Actual PK-12 Enrollments
from January 2013 Report

Year	Actual	Projected	Difference	% Error
2012-13	9,754.5	9,797	+42.5	+0.4%
2013-14	9,707.5	9,792	+84.5	+0.9%
2014-15	9,626	9,810	+184	+1.9%
2015-16	9,607.5	9,798	+190.5	+2.0%
2016-17	9,654.5	9,877	+222.5	+2.3%
2017-18	9,678	9,936	+258	+2.7%

In our previous study, enrollment was projected to slowly increase throughout the projection period. Instead, enrollments slowly declined before stabilizing. Enrollments were overestimated in each year where error rates ranged from 0.4% to 2.7%. Expressed in numbers, the projections differed from actual enrollments by 42.5-258 students with the magnitude increasing over time. In a survey of educational planners who complete enrollment projections, two-thirds believe that an

error rate of 1% per year is acceptable¹. For a six-year projection, this would mean that a 6% error rate in the sixth year would be acceptable. The projection was within this parameter in each of the projection years.

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

At the elementary level (PK-5), enrollments were overestimated in each year where error rates ranged from 0.5% to 4.7%. Expressed in numbers, the projections differed from actual enrollments by 22-198 students with the magnitude of the error generally increasing over time. Error rates were less than 1% in each of the first two years. For the middle school grades (6-8), enrollments were overestimated in the first four years and then underestimated in the last two years of the projection period. Error rates ranged from -2.6% to +1.7%. Of the three grade configuration levels, error rates were lowest for the middle school grades and were less than 1% in four of the six years. The projections differed from actual enrollments by 7-64 students over the six-year period. Finally, for the high school grades (9-12), enrollments were overestimated in each year where error rates ranged from 0.3% to 4.3%. Enrollments were overestimated by 11-127.5 students.

Table 2
Comparison of Projected to Actual Enrollments
by Grade Configuration from January 2013 Report

	Elementary (PK-5)				Middle (6-8)				High (9-12)			
Year	Actual	Proj.	Diff.	% Error	Actual	Proj.	Diff.	% Error	Actual	Proj.	Diff.	% Error
2012-13	4,252	4,274	+22	+0.5%	2,294	2,301	+7	+0.3%	3,208.5	3,222	+13.5	+0.4%
2013-14	4,302.5	4,337	+34.5	+0.8%	2,249	2,288	+39	+1.7%	3,156	3,167	+11	+0.3%
2014-15	4,245	4,346	+101	+2.4%	2,297	2,311	+14	+0.6%	3,084	3,153	+69	+2.2%
2015-16	4,278	4,350	+72	+1.7%	2,340	2,355	+15	+0.6%	2,989.5	3,093	+103.5	+3.5%
2016-17	4,239	4,346	+107	+2.5%	2,444	2,432	-12	-0.5%	2,971.5	3,099	+127.5	+4.3%
2017-18	4,221	4,419	+198	+4.7%	2,436	2,372	-64	-2.6%	3,021	3,145	+124	+4.1%

¹ 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)

Population Trends

1. West Windsor Township

Located in Mercer County, West Windsor Township (“West Windsor”) contains a land area of approximately 25.56 square miles, with an additional 0.71 square miles of water area. In the 2010 Census, West Windsor had 27,165 residents, which is approximately 1,062.8 persons per square mile. Historical and projected populations for West Windsor from 1940- 2040 are shown in Table 3 and Figure 1. As shown in the table, the population in West Windsor nearly quadrupled in size from 1940 to 1980 as it grew from 2,160 to 8,542. West Windsor has continued to grow at a rapid rate, as its population more than tripled in size from 1980-2010. In the 1980s alone, the population nearly doubled (+87.6%) in size.

Table 3
Historical and Projected Populations for West Windsor
1940-2040

Year	Population	Percent Change
Historical¹		
1940	2,160	N/A
1950	2,519	+16.6%
1960	4,016	+59.4%
1970	6,431	+60.1%
1980	8,542	+32.8%
1990	16,021	+87.6%
2000	21,907	+36.7%
2010	27,165	+24.0%
2016 (est.)	28,207	+3.8%
Projected²		
2020	27,551	-2.3%
2030	28,893	+4.9%
2040	29,279	+1.3%

Sources: ¹United States Census Bureau

²Delaware Valley Regional Planning Commission (2012)

In addition, a population estimate for 2016 is provided in Table 1. The estimated population in 2016 is 28,207 persons, which is a gain of more than 1,000 persons from 2010. The Census Bureau publishes estimates every July 1st following the last decennial census and are computed using the decennial census base counts, number of births and deaths in a community, and migration data (both domestic and international).

Population projections from 2020-2040, which were prepared by the Delaware Valley Regional Planning Commission (“DVRPC”), indicate that the population in West Windsor will increase, but at a much slower rate than historically. However, as the 2016 estimate has already exceeded the DVRPC projection in 2020, it is likely that the projections need to be revised and increased to reflect the greater growth. In 2040, West Windsor’s population is projected to be 29,279, which would be a 7.8% increase from the 2010 population and a gain of more than 2,000 persons.

2. Plainsboro Township

Plainsboro Township (“Plainsboro”), which is located in Middlesex County, contains a land area of approximately 11.78 square miles, with an additional 0.42 square miles of water area. Historical and projected populations for Plainsboro from 1940-2040 are shown in Table 4 and Figure 1. In the 2010 Census, Plainsboro had 22,999 residents, which is 1,952.4 persons per square mile. Plainsboro’s greatest growth occurred in the 1970s when the population more than tripled (+240.1%) in size. Significant growth continued in the 1980s when the population more than doubled (153.6%) in size. In recent decades, growth has slowed in comparison, but is still quite substantial. The estimated population in 2016 is 23,407 persons, which is a gain of approximately 400 persons from 2010.

Table 4
Historical and Projected Populations for Plainsboro
1940-2040

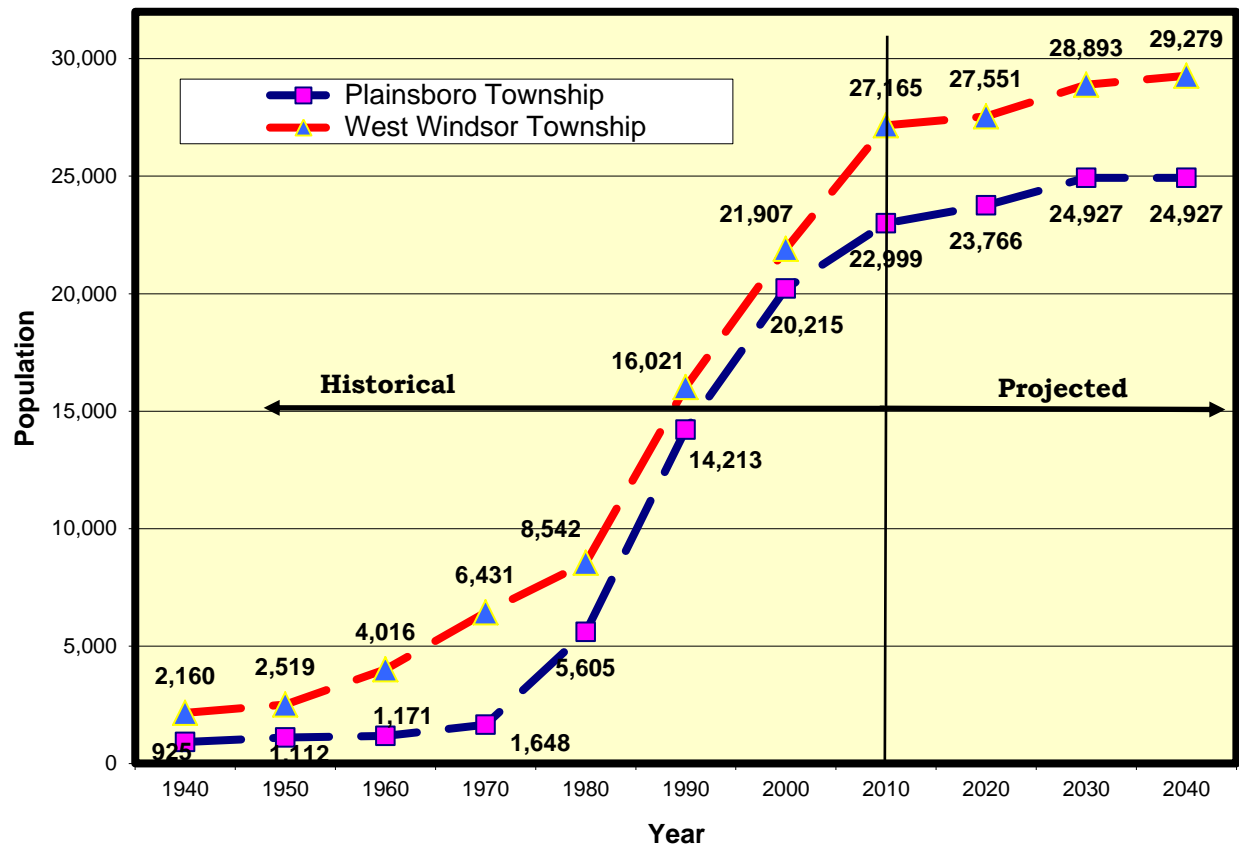
Year	Population	Percent Change
Historical¹		
1940	925	N/A
1950	1,112	+20.2%
1960	1,171	+5.3%
1970	1,648	+40.7%
1980	5,605	+240.1%
1990	14,213	+153.6%
2000	20,215	+42.2%
2010	22,999	+13.8%
2016 (est.)	23,407	+1.8%
Projected²		
2020	23,766	+1.5%
2030	24,927	+4.9%
2040	24,927	+0.0%

Sources: ¹United States Census Bureau (2000)

²North Jersey Transportation Planning Authority, Inc. (2013).

Population projections from 2020-2040, which were prepared by the North Jersey Transportation Planning Authority (“NJTPA”), indicate that the population in Plainsboro will slowly increase before stabilizing. In 2040, Plainsboro’s population is projected to be 24,927, which would be an 8.4% increase from the 2010 population and a gain of nearly 2,000 persons.

Figure 1
Historical and Projected Populations
1940-2040



Demographic Profiles

In Table 5 following, selected demographic characteristics of West Windsor and Plainsboro are compared from the 2000 and 2010 Censuses and the 2012-2016 American Community Survey (“ACS”). While some Census variables account for everyone in the population (e.g., age and race), other variables are collected from a sample (e.g., median family income, educational attainment, poverty status, etc.). The ACS replaced the long form of the Census, last administered in 2000 to approximately 16% of the population in the United States. For small municipalities such as West Windsor and Plainsboro, ACS data represent a sample collected over a five-year time period, where the estimates represent the average characteristics between January 2012 and December 2016. 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 2012 to 2016, 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. West Windsor Township

While Whites are the largest race in West Windsor, their population has declined rather significantly from 2000 to 2010. In 2010, the township was 54.9% White as compared to 71.5% in 2000, a loss of 16.6 percentage points. Asians were the second-largest race at 37.7% in 2010, which is an increase of 14.9 percentage points from the 22.8% that existed in 2000. The Census Bureau does not consider Hispanic as a separate race; rather it identifies the percentage of people having Hispanic origin. Hispanics in the Census population can be part of the White, Black, Asian or any of the other race categories. It is not a mutually exclusive race category. The concentration of persons having Hispanic origin was 4.5% in 2010, which is a small increase from the 4.1% that existed in 2000.

Regarding nativity, 39.5% of West Windsor residents were foreign-born in the 2012-2016 ACS, which is nearly double the 2000 percentage of 22.4%. As a point of comparison, New Jersey’s foreign-born resident percentage was 21.8% in the 2012-2016 ACS. While not shown in the table, place of birth, which serves as a proxy for country of origin, indicates that India and China were the largest sources of immigrants in the 2012-2016 ACS, accounting for 43.0% and 20.3% respectively of the foreign-born population. This differs from 2000 when China was the largest source of the foreign-born population (24.9%) and India was the second-largest source (19.9%).

The median age in West Windsor has increased from 37.0 years in 2000 to 39.6 years in 2010, which is similar to the median age in New Jersey (39.4 years). During the same time period, the percentage of people under the age of 18 years has decreased from 31.8% to 28.4%, which predominantly corresponds to school-age children.

Table 5
Selected Demographic Characteristics of West Windsor and Plainsboro

	West Windsor		Plainsboro	
Race Origin	2000 Census	2010 Census 2012-2016 ACS	2000 Census	2010 Census 2012-2016 ACS
White alone	71.5%	54.9%	58.2%	41.1%
Black or African American alone	2.8%	3.7%	7.6%	8.0%
American Indian and Alaska Native alone	0.1%	0.1%	0.1%	0.3%
Asian alone	22.8%	37.7%	30.5%	46.2%
Native Hawaiian and Other Pacific Islander alone	0.0%	0.0%	0.0%	0.0%
Other Race alone	1.1%	1.0%	1.4%	1.8%
Two or more Races	1.8%	2.6%	2.2%	2.6%
Total	100.0%¹	100.0%¹	100.0%¹	100.0%¹
Hispanic Origin	4.1%	4.5%	4.6%	6.2%
Place of Birth				
Foreign-Born	22.4%	39.5%	34.5%	48.0%
Age				
Under 18	31.8%	28.4%	24.6%	24.7%
18-64	62.0%	60.8%	71.2%	67.8%
65 and over	6.2%	10.8%	4.2%	7.5%
Median age	37.0 years	39.6 years	32.9 years	35.5 years
Educational Attainment				
Bachelor's degree or higher	73.9%	81.7%	70.3%	73.6%
Graduate or professional degree	39.0%	48.0%	31.7%	38.9%
Income				
Median family income	\$127,877	\$189,443	\$88,783	\$113,588
% of Persons in Poverty aged 5-17	2.2%	4.3%	2.1%	2.0%
Housing Units				
Total Number	7,450	9,810	9,133	10,089 ²
Occupied units	7,282 (97.7%)	9,449 (96.3%)	8,742 (95.7%)	9,402 (93.2%)
Owner-occupied units	5,899 (81.0%)	7,127 (75.4%)	3,676 (42.0%)	4,610 (49.0%)
Renter-occupied units	1,383 (19.0%)	2,322 (24.6%)	5,066 (58.0%)	4,792 (51.0%)
Median value of an owner-occupied unit	\$333,800	\$588,700	\$257,100	\$454,400
Average household size	3.01	2.85	2.30	2.43
Housing Type				
Total number	7,450	10,073	9,133	10,545 ²
1-unit, attached or detached	5,801 (77.9%)	7,434 (73.8%)	3,532 (38.7%)	3,896 (36.9%)
Two units	139 (1.9%)	44 (0.4%)	73 (0.8%)	106 (1.0%)
Three or four units	55 (0.7%)	134 (1.3%)	707 (7.7%)	643 (6.1%)
Five to nine units	348 (4.7%)	466 (4.6%)	1,515 (16.6%)	2,447 (23.2%)
10 to 19 units	870 (11.7%)	1,370 (13.6%)	2,261 (24.8%)	2,244 (21.3%)
20 or more units	237 (3.2%)	625 (6.2%)	1,045 (11.4%)	1,209 (11.5%)
Mobile home, Boat, Van, RV, etc.	0 (0.0%)	0 (0.0%)	0 (0.0%)	0 (0.0%)

Sources: American Community Survey (2012-2016), United States Census (2000 and 2010)

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

²Total number differs as Housing Units are from the 2010 Census while Housing Type data are from the 2012-16 ACS.

Regarding educational attainment for adults aged 25 and over, 81.7% of the population had a bachelor's degree or higher in the 2012-2016 ACS as compared to 73.9% in 2000, which is a gain of 7.8 percentage points. West Windsor is a highly-educated population, as its percentage of persons having a bachelor's degree or higher is much greater than the state of New Jersey (37.5%). The percentage of persons with graduate or professional degrees increased from 39.0% to 48.0% during this time period, which is a gain of 9.0 percentage points.

Median family income increased from \$127,877 in 2000 to \$189,443 in the 2012-2016 ACS, a gain of 48.1%. By comparison, median family income in New Jersey is \$90,757, which is less than half than West Windsor's. During this time period, the percentage of school-age children (5-17) that are in poverty increased from 2.2% to 4.3%.

Regarding housing, there were approximately 9,810 housing units in West Windsor in 2010, which is a gain of 2,360 housing units (+31.7%) from 2000. From 2000 to 2010, the occupancy rate decreased by 1.4 percentage points, which may be a function of the downturn in the housing market. Renter-occupied units accounted for 24.6% of the occupied units in West Windsor in 2010, which is an increase of 5.6 percentage points from 2000. In the last decade, the average household size decreased from 3.01 to 2.85 persons. Finally, the median home price of an owner-occupied unit in the 2012-2016 ACS was \$588,700, which is a 76.4% gain from the value reported in 2000 (\$333,800).

With respect to housing type, 73.8% of the homes in the township are one-unit, either attached or detached, which is a 4.1 percentage point decline from 2000. Homes with 10-19 units were the second-largest type of housing in the 2012-2016 ACS and consisted of 13.6% of the housing stock. Homes with 20 or more units had the largest percentage point gain (+3.0) of the different home types from 2000 to 2010.

2. Plainsboro Township

Unlike West Windsor, Asians are the largest race in Plainsboro. In 2010, 46.2% of the population was Asian, which is a 15.7 percentage-point gain from 2000. Whites are the second-largest race and accounted for 41.1% of the population in 2010, which is a decline of 17.1 percentage points from the 2000 percentage (58.2%). The concentration of persons having Hispanic origin was 6.2% in 2010, which is a small increase from the 4.6% that existed in 2000.

Regarding nativity, 48.0% of Plainsboro residents were foreign-born in the 2012-2016 ACS as compared to 34.5% in 2000, which is a gain of 13.5 percentage points. Like West Windsor, this greatly exceeds the percentage of foreign-born residents in New Jersey (21.8%). While not shown in the table, place of birth, which serves as a proxy for country of origin, indicates that India and China were the largest sources of immigrants in 2000, accounting for 37.3% and 17.1% respectively of the foreign-born population. In the 2012-2016 ACS, India continues to be the largest source, but accounts for a larger share (55.8%) of the foreign-born population. China was the second-largest source (13.0%) in the 2012-2016 ACS.

The median age in Plainsboro has increased from 32.9 years in 2000 to 35.5 years in 2010, which is lower than the median age in West Windsor and New Jersey. During the same time period, the percentage of people under the age of 18 years remained nearly constant.

Regarding educational attainment for adults aged 25 and over, 73.6% of the population had a bachelor's degree or higher in the 2012-2016 ACS as compared to 70.3% in 2000, which is much higher than that of New Jersey (37.5%). The percentage of persons with graduate or professional degrees increased from 31.7% to 38.9% during this time period, a gain of 7.2 percentage points. Both Plainsboro and West Windsor have similar levels of educational attainment and are highly-educated communities.

Median family income increased from \$88,783 in 2000 to \$113,588 in the 2012-2016 ACS, a gain of 27.9%. While the median family income in Plainsboro is higher than that of New Jersey, it is significantly lower than West Windsor's. During this time period, the percentage of school-age children (5-17) that are in poverty decreased slightly from 2.1% to 2.0%.

Regarding housing, there were approximately 10,089 housing units in Plainsboro in 2010, which is a gain of 956 housing units (+10.5%) from 2000. While West Windsor added more housing units than Plainsboro in the last decade, Plainsboro still has more housing units than West Windsor. From 2000 to 2010, the occupancy rate decreased by 2.5 percentage points, which may be a function of the downturn in the housing market. Renter-occupied units accounted for 51.0% of the occupied units in Plainsboro in 2010, which is a decline of 7.0 percentage points from 2000. Despite the decline, the percentage of renter-occupied units in Plainsboro is more than double than that of West Windsor. The median home price of an occupied unit in the 2012-2016 ACS was \$454,400, which is a 76.7% gain from the value reported in 2000 (\$257,100).

With respect to housing type, 36.9% of the homes in Plainsboro are one-unit, either attached or detached, which is slightly lower than the 2000 percentage (38.7%). Homes with 5-9 units were the second-largest type of housing in the 2012-2016 ACS and consisted of 23.2% of the housing stock, which is a gain of 6.6 percentage points from the 2000 percentage (16.6%). Homes with 5-9 units also had the largest percentage point gain of the different home types over this time period. Plainsboro also has a significant number of homes with 10-19 units, consisting of 21.3% of the housing stock in the 2012-2016 ACS. In comparing the housing types from both communities, Plainsboro has a greater percentage of homes typically occupied by renters (2 or more units) than West Windsor, which was confirmed by the renter-occupancy percentages discussed previously.

District Overview

West Windsor-Plainsboro Regional has ten (10) schools educating children in grades pre-kindergarten through twelve. The district consists of four elementary schools, two intermediate schools, two middle schools, and two high schools. West Windsor and Plainsboro each have five schools within their respective borders. In Figure 2, the location of each of the district's schools is shown with respect to the municipal boundaries. Figure 3 shows the four elementary schools and their respective attendance areas while Figure 4 shows the two intermediate schools and their respective attendance areas. Figure 5 shows the two middle schools and their respective attendance areas while Figure 6 shows the two high schools and their respective attendance areas. It should be noted that there is a large section in the southwest corner of West Windsor that is not affiliated with any attendance area as it contains Mercer County Park. In addition, there are smaller areas in both townships not affiliated with an attendance area as they contain age-restricted housing developments with no school-age children.

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

Figure 2
School Locations – West Windsor-Plainsboro Regional School District

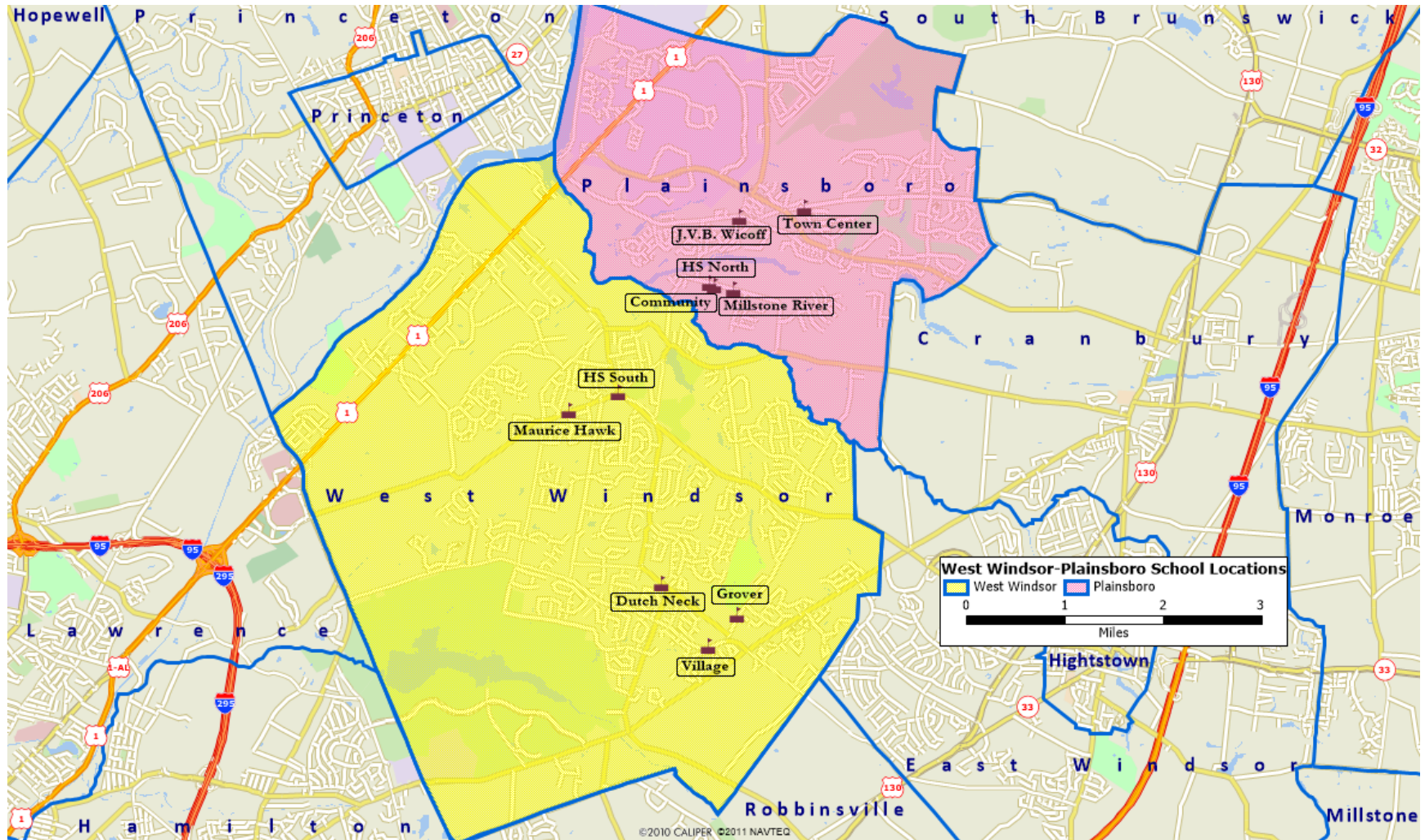


Figure 3
Elementary School Locations and Attendance Boundaries

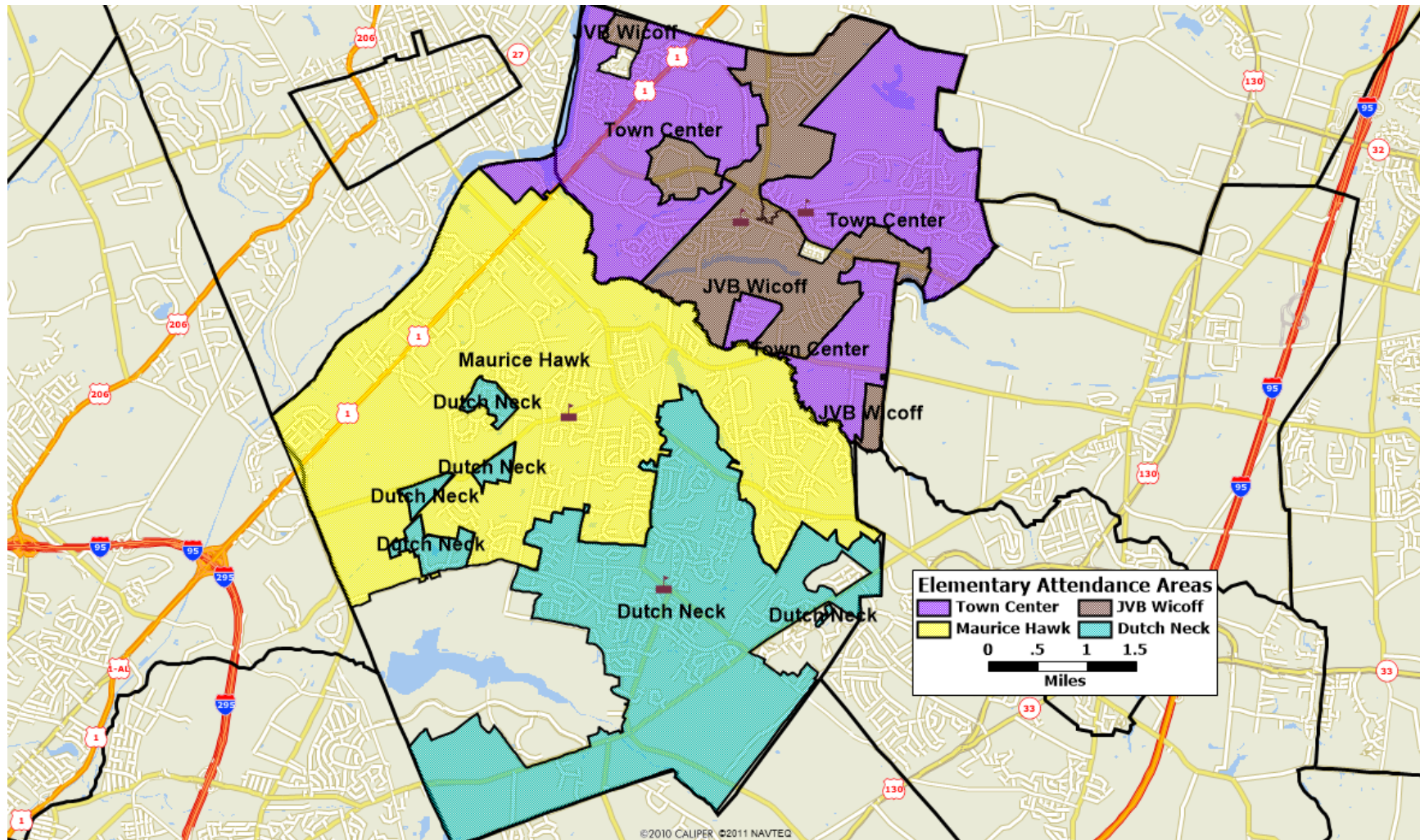


Figure 4
Intermediate School Locations and Attendance Boundaries

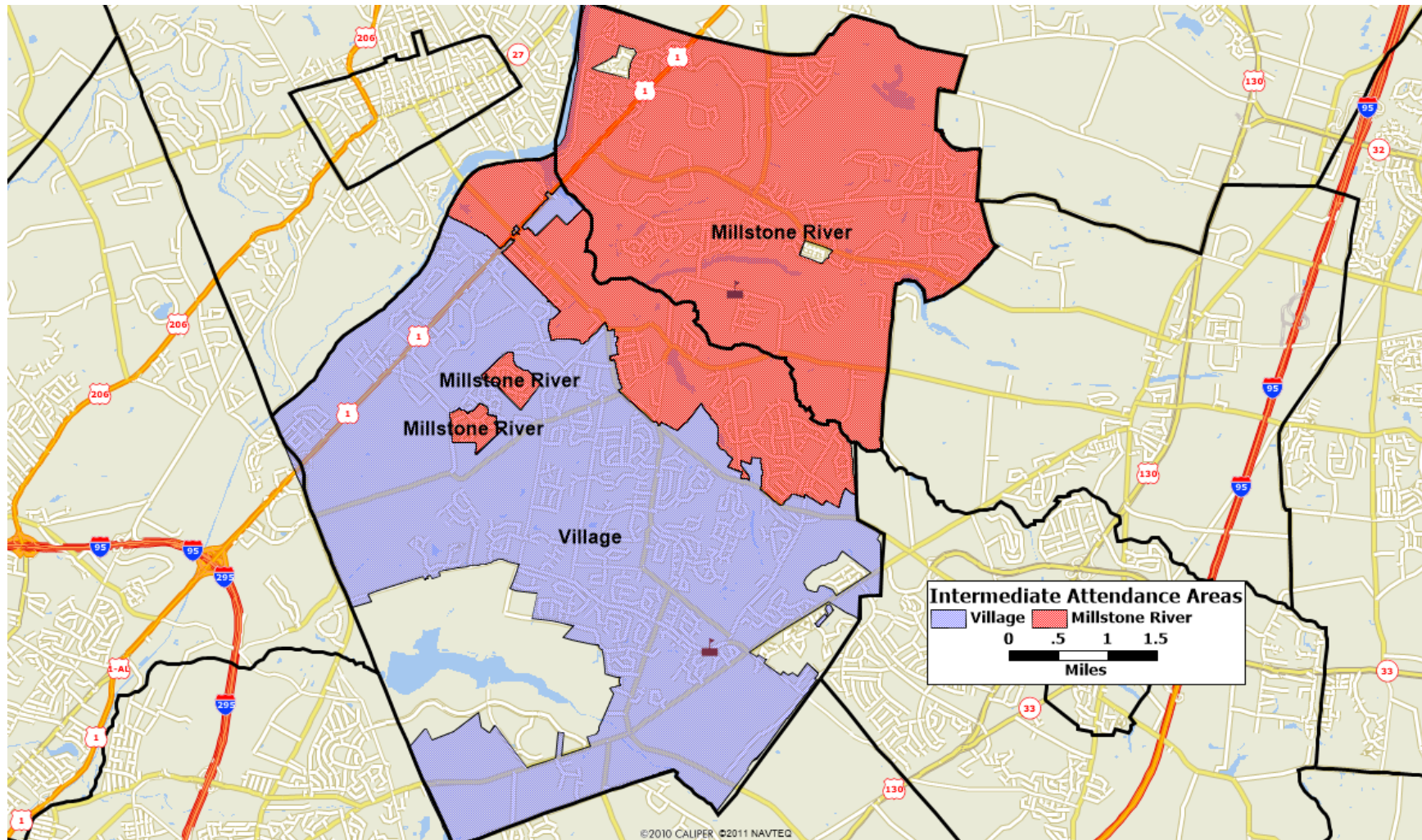


Figure 5
Middle School Locations and Attendance Boundaries

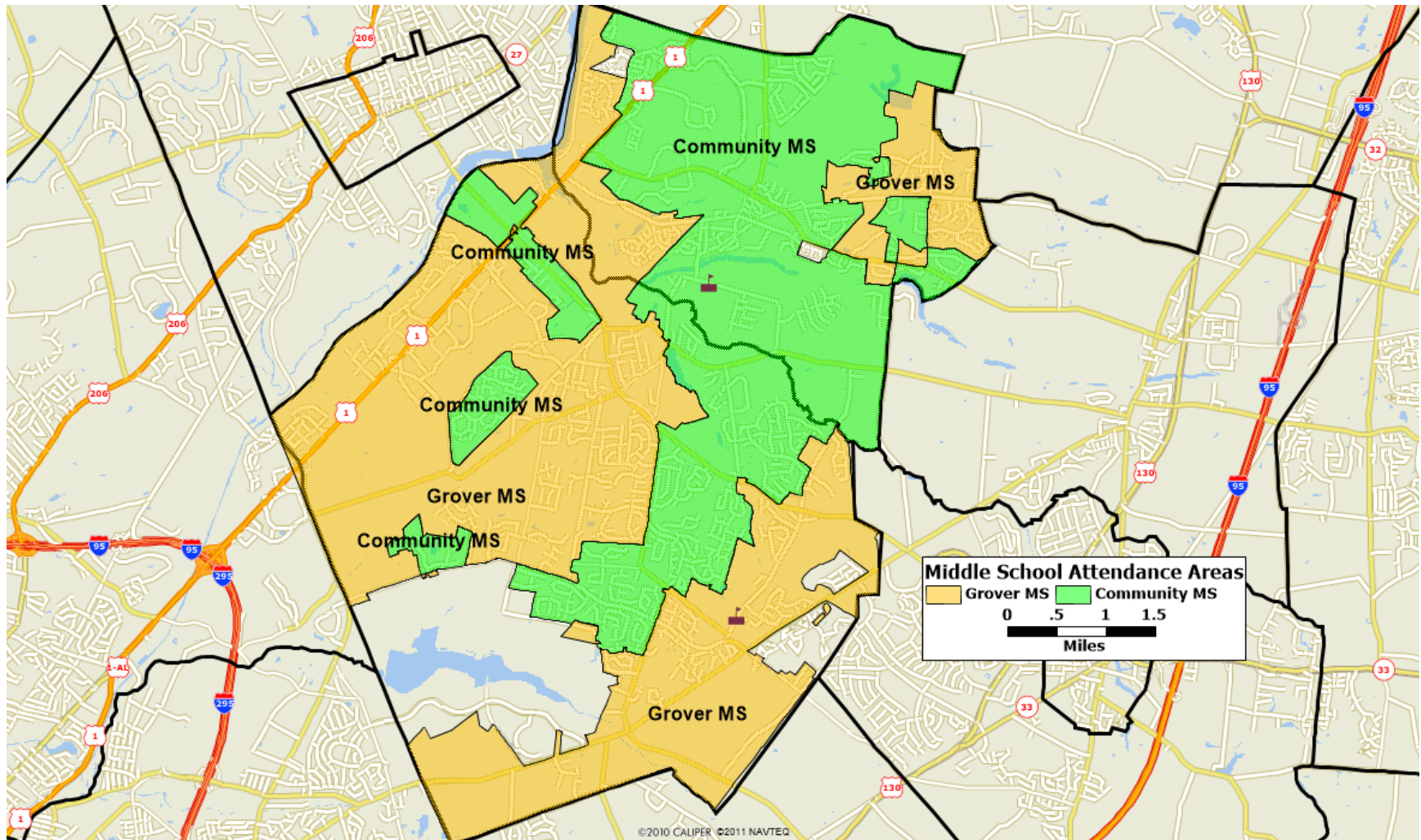
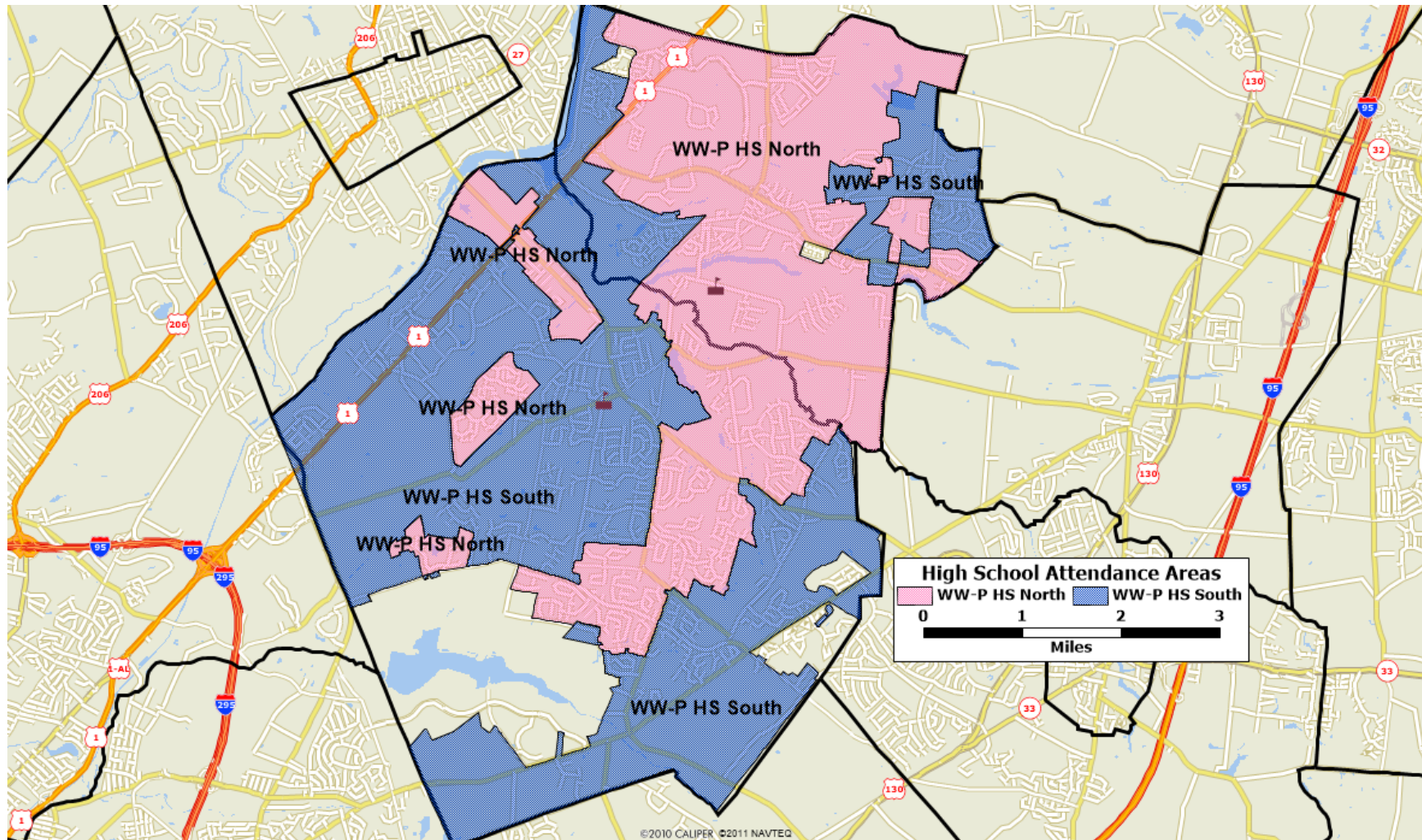


Figure 6
High School Locations and Attendance Boundaries



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, while greater than 1.00 indicates increasing enrollment. If, for example, a school district had 100 fourth graders and the next year only had 95 fifth graders, the survival ratio would be 0.95.

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

Historical Enrollment Trends

Historical enrollments for West Windsor-Plainsboro Regional from 2008-09 through 2017-18, a ten-year period, are shown in Figure 7 and Table 6. After peaking at 9,801 students in 2009-10, enrollment declined through 2015-16 before reversing trend. In 2017-18, enrollment is 9,678, which is a loss of 123 students from the 2009-10 peak enrollment.

Table 7 following shows computed grade-by-grade survival ratios from 2008-09 to 2017-18. In addition, the average, minimum, and maximum survival ratios are shown for the past ten years along with the five-year averages, which were used to project enrollments. The average survival ratios also indicate the net migration by grade, where values over 1.000 reflect net inward migration and values below 1.000 reflect net outward migration. Eight of the thirteen average survival ratios (five-year average) were above 1.000, indicating a general net inward migration of students. Four of the five ratios that were below 1.000 were in the high school grades. Factors related to inward migration include families with school-age children purchasing an existing home or new housing unit. The reasons for families moving into a community vary. For instance, a family could move into West Windsor or Plainsboro for economic reasons and proximity to employment. Another plausible reason for inward migration is the reputation of the school district, as the appeal of a school district draws families into a community, resulting in the transfer of students into the district. On the flip side, outward migration is caused by families with children moving out of the community, perhaps due to difficulty in finding employment or affordable housing. Outward migration in the school district can also be caused by parents choosing to withdraw their children from public school to attend private or parochial schools. In the case of West Windsor-Plainsboro Regional, the reasons for migration are not explicitly known (such as for economic reasons or the appeal of the school district), as exit and entrance interviews would need to be conducted for all children leaving or entering the district.

Figure 7
West Windsor-Plainsboro Regional School District
Historical Enrollments
2008-09 to 2017-18

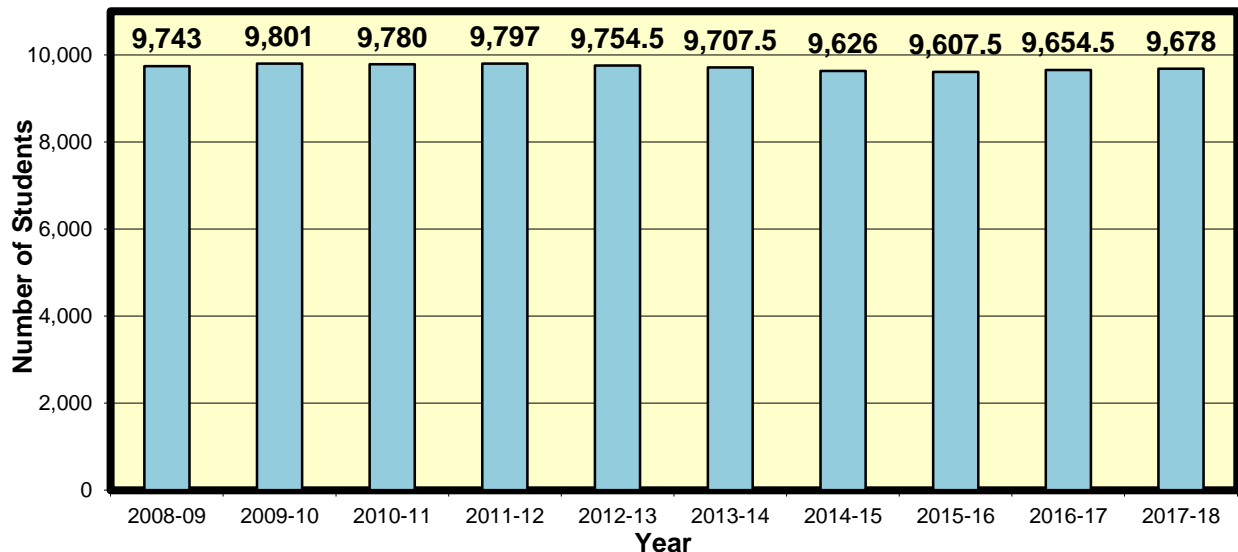


Table 6
West Windsor-Plainsboro Regional School District Historical Enrollments
2008-09 to 2017-18

Year ¹	PK RE ²	K	1	2	3	4	5	6	7	8	9	10	11	12	SE ³	PK-5 Total	6-8 Total	9-12 Total	PK-12 Total
2008-09	0	608	626	674	709	688	696	803	787	796	820	763	784.5	764.5	224	4,164	2,399	3,180	9,743
2009-10	0	597	671	655	710	737	701	715	824	770	814	805.5	756.5	777	268	4,249	2,352	3,200	9,801
2010-11	0	588	669	705	677	715	736	732	728	835	771	813	799	760	252	4,243	2,333	3,204	9,780
2011-12	49	530	674	698	721	681	713	757	750	737	827	796	812	796	256	4,234	2,266	3,297	9,797
2012-13	31	595	615	709	706	737	688	756	734	750	754	843.5	783	781	272	4,252	2,294	3,208.5	9,754.5
2013-14	55	548	685	648	715	752	740	698	766	749	751	748	829	778.5	245	4,302.5	2,249	3,156	9,707.5
2014-15	13	538	626	708	671	741	767	773	719	753	732	741.5	739	813.5	291	4,245	2,297	3,084	9,626
2015-16	78	588	669	676	763	712	792	795	809	736	760	745.5	750	727	7	4,278	2,340	2,989.5	9,607.5
2016-17	43	509	661	716	752	773	733	810	803	813	714	735	743.5	734.5	115	4,239	2,444	2,971.5	9,654.5
2017-18	56	524	582	692	746	727	792	774	812	838	802	721	736	737	139	4,221	2,436	3,021	9,678

Notes: ¹Data were provided by the New Jersey Department of Education (<http://www.nj.gov/education/data/enr/>) and the West Windsor-Plainsboro Regional School District.

²Pre-kindergarten regular education enrollment

³Self-contained special education enrollment/Ungraded Students

Table 7
West Windsor-Plainsboro Regional School District Historical Survival Ratios
2008-09 to 2017-18

Progression Years	B-K	K-1	1-2	2-3	3-4	4-5	5-6	6-7	7-8	8-9	9-10	10-11	11-12
2008-09 to 2009-10	1.0642	1.1036	1.0463	1.0534	1.0395	1.0189	1.0273	1.0262	0.9784	1.0226	0.9823	0.9915	0.9904
2009-10 to 2010-11	1.0280	1.1206	1.0507	1.0336	1.0070	0.9986	1.0442	1.0182	1.0133	1.0013	0.9988	0.9919	1.0046
2010-11 to 2011-12	0.9888	1.1463	1.0433	1.0227	1.0059	0.9972	1.0285	1.0246	1.0124	0.9904	1.0324	0.9988	0.9962
2011-12 to 2012-13	1.0171	1.1604	1.0519	1.0115	1.0222	1.0103	1.0603	0.9696	1.0000	1.0231	1.0200	0.9837	0.9618
2012-13 to 2013-14	0.9716	1.1513	1.0537	1.0085	1.0652	1.0041	1.0145	1.0132	1.0204	1.0013	0.9920	0.9828	0.9943
2013-14 to 2014-15	0.9292	1.1423	1.0336	1.0355	1.0364	1.0199	1.0446	1.0301	0.9830	0.9773	0.9874	0.9880	0.9813
2014-15 to 2015-16	1.1373	1.2435	1.0799	1.0777	1.0611	1.0688	1.0365	1.0466	1.0236	1.0093	1.0184	1.0115	0.9838
2015-16 to 2016-17	0.9640	1.1241	1.0703	1.0207	1.0131	1.0295	1.0227	1.0101	1.0049	0.9701	0.9671	0.9973	0.9793
2016-17 to 2017-18	0.9291	1.1434	1.0469	1.0419	1.0536	1.0246	1.0559	1.0025	1.0436	0.9865	1.0098	1.0014	0.9913
Maximum Ratio	1.1373	1.2435	1.0799	1.0777	1.0652	1.0688	1.0603	1.0466	1.0436	1.0231	1.0324	1.0115	1.0046
Minimum Ratio	0.9291	1.1036	1.0336	1.0085	1.0059	0.9972	1.0145	0.9696	0.9784	0.9701	0.9671	0.9828	0.9618
Avg. 5-Year Ratios	0.9862	1.1633	1.0577	1.0439	1.0410	1.0357	1.0399	1.0223	1.0138	0.9858	0.9957	0.9995	0.9839
Avg. 10-Year Ratios	1.0033	1.1484	1.0529	1.0339	1.0338	1.0191	1.0372	1.0157	1.0089	0.9980	1.0009	0.9941	0.9870

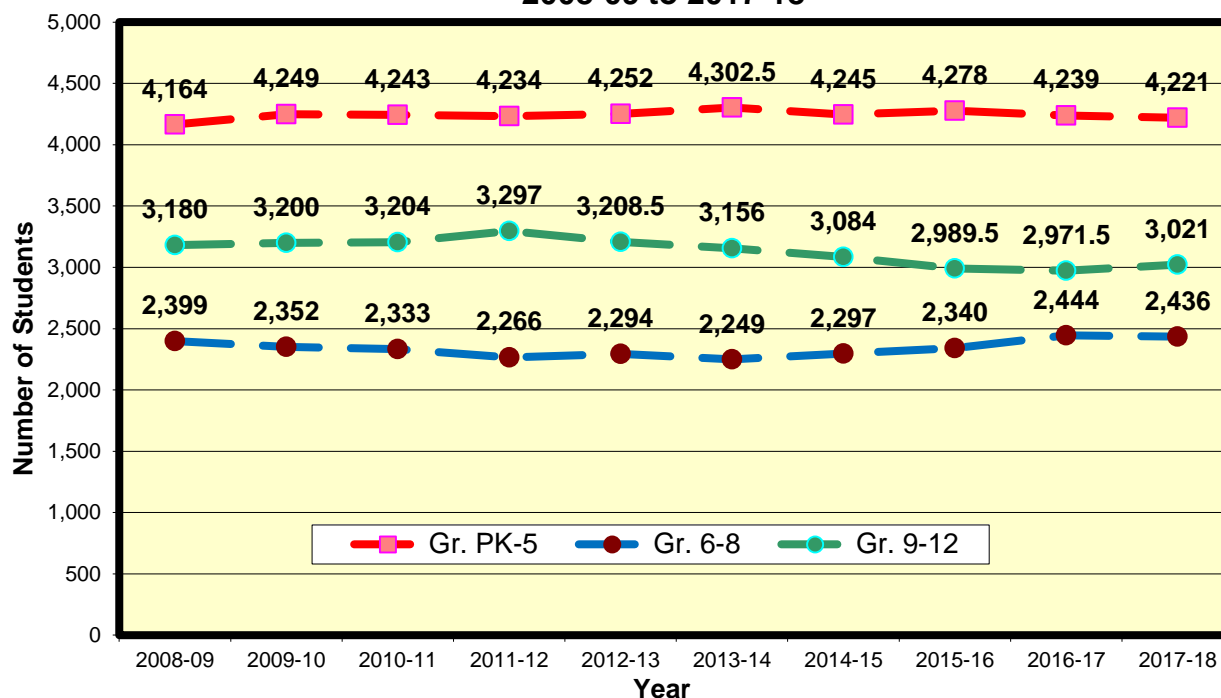
Historical enrollments are also shown in Table 6 and Figure 8 by grade configuration (PK-5, 6-8, and 9-12). It should be noted that the enrollments of the PK-2, PK-3, 3-5, and 4-5 schools were grouped together for reporting purposes. Self-contained special education/ungraded students were incorporated into the totals by level.

At the elementary level containing grades PK-5, enrollment has been fairly stable since the 2009-10 school year, varying from 4,221-4,302.5, a range of 81.5 students. In 2017-18, enrollment is 4,221 students, which is slightly higher than the 2008-09 enrollment of 4,164.

For grades 6-8, enrollment slowly declined through 2013-14 before reversing trend. In 2017-18, enrollment is 2,436, which represents a gain of 187 students from the low of 2,249 in 2013-14.

Finally, at the high school level, enrollment increased through 2011-12 before reversing trend. Since then, enrollment declined through 2016-17 before reversing trend again in 2017-18. In 2017-18, high school enrollment is 3,021, which represents a loss of 159 students from the 2008-09 enrollment of 3,180.

Figure 8
West Windsor-Plainsboro Regional School District
Historical Enrollments by Level
2008-09 to 2017-18



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, 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. The district has experienced negative first grade replacement in each of the last nine years. Negative first grade replacement occurs when the number of graduating twelfth grade students is larger than the number of first grade students replacing them in the next year. Conversely, positive first grade replacement occurs when the number of graduating twelfth grade students is less than the number of first grade students entering the district in the next year. As shown in Figure 9, negative first grade replacement has ranged from 66-181 students per year. In 2017-18, there was a loss of 152.5 students due to first grade replacement, as 734.5 twelfth graders graduated in 2016-17 and were replaced by 582 first grade students in 2017-18. In the last five years, the district has lost an average of 122 students per year due to first grade replacement.

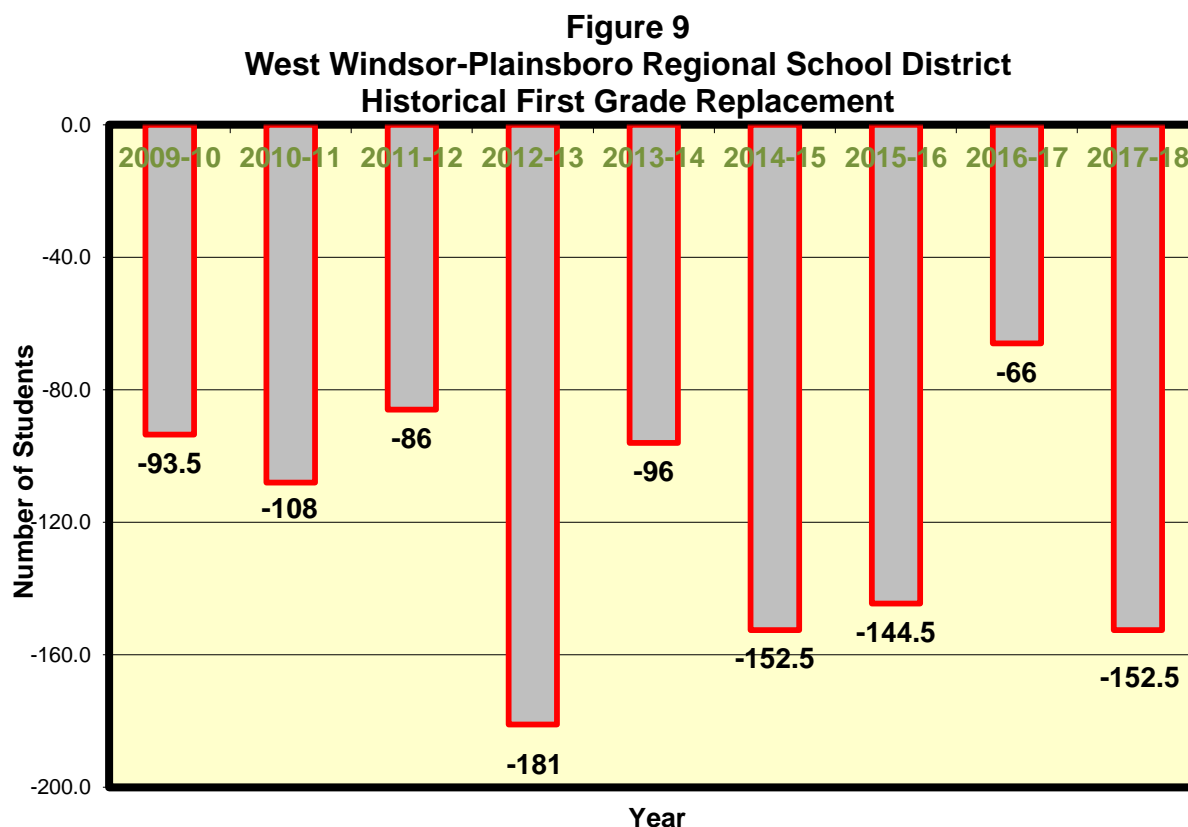
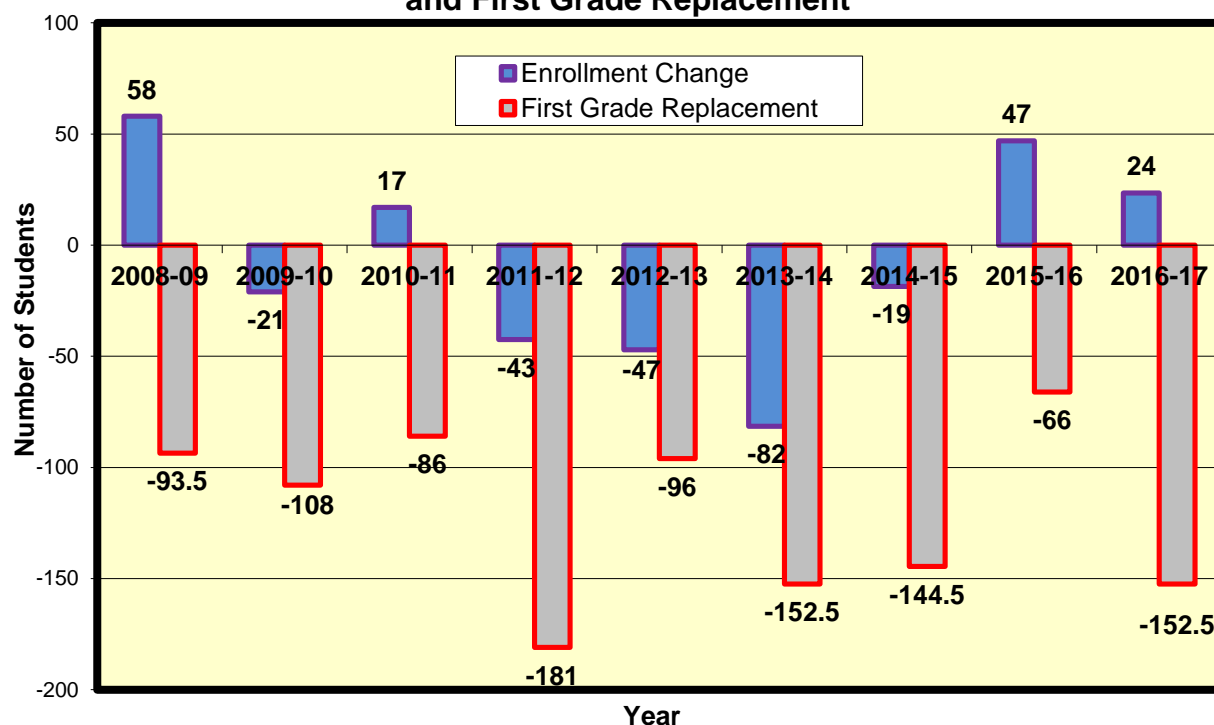


Figure 10 shows the annual change in total enrollment compared to first grade replacement. As the figure demonstrates, there appears to be a strong relationship, statistically speaking, between the overall change in enrollment and first grade replacement. Although this data represents a small sample, the correlation coefficient between the two variables was 0.57. 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 0.57, there appears to be a strong relationship between first grade replacement and enrollment change in the school district in the last nine years.

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

Figure 10
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 2012, there were a total of 564 births in West Windsor and Plainsboro. Five years later (the 2017-18 school year), 524 children enrolled in kindergarten, which is equal to a survival ratio of 0.929 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 community's boundaries and are attending kindergarten in the school district five years later, i.e. an inward migration of children into the district. 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, with families moving into the community having children of age to attend kindergarten. Birth-to-kindergarten survival ratios that are below 1.000 indicate that a number of children born within a community are not attending kindergarten in the school district five years later. This is common in communities where a high proportion of children attend private, parochial, or out-of-district special education facilities, or where there is a net migration of families moving out of the community. It is also common in school districts that have a half-day kindergarten program where parents choose to send their children to a private full-day kindergarten for the first year. Birth-to-kindergarten survival ratios have been below 1.000 in four of the last five years, which is likely due to having a half-day kindergarten program. Birth-to-kindergarten survival ratios have been fairly consistent over the last ten years, ranging from 0.929 to 1.137.

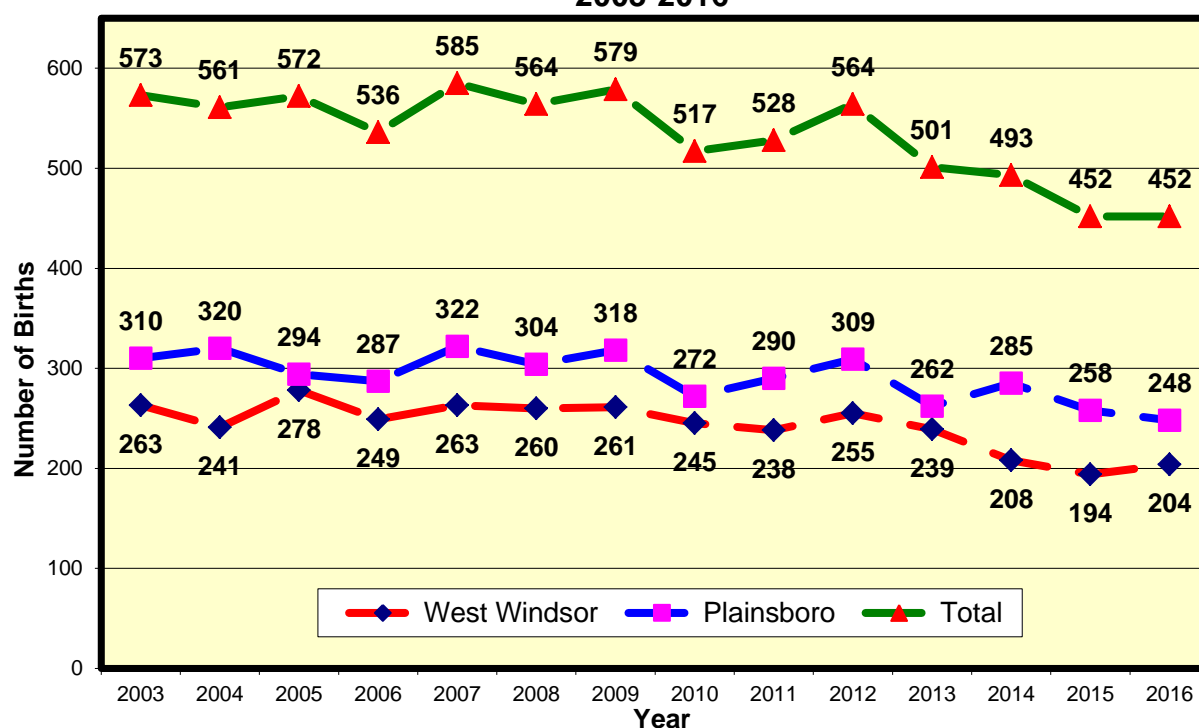
Table 8
Birth Counts and Historical Birth-to-Kindergarten Survival Ratios
in the West Windsor-Plainsboro Regional School District

Birth Year¹	Births West Windsor Township	Births Plainsboro Township	Total Number of Births	Kindergarten Students Five Years Later	Birth-to- Kindergarten Survival Ratio
2003	263	310	573	608	1.061
2004	241	320	561	597	1.064
2005	278	294	572	588	1.028
2006	249	287	536	530	0.989
2007	263	322	585	595	1.017
2008	260	304	564	548	0.972
2009	261	318	579	538	0.929
2010	245	272	517	588	1.137
2011	238	290	528	509	0.964
2012	255	309	564	524	0.929
2013	239	262	501	N/A	N/A
2014	208	285	493	N/A	N/A
2015	194	258	452	N/A	N/A
2016	204	248	452	N/A	N/A

Note: ¹Birth data were provided by the New Jersey Center for Health Statistics from 2003-2016.

Geocoded birth data were provided by the New Jersey Center for Health Statistics (“NJCHS”) from 2003-2016 by assigning geographic coordinates to a birth mother based on her street address. Births for 2017 were not yet available. As shown in Figure 11, the number of births in West Windsor has been slowly declining. After being fairly stable from 2003-2009, ranging from 241-278, the number of births has declined to 204 in 2016. In Plainsboro, the number of births has also been trending lower. After the number of births peaked at 322 in 2007, births have declined to 248 in 2016. Despite West Windsor having a larger population than Plainsboro, there have been a consistently greater number of births in Plainsboro. Combining the data from the two communities, the number of births was fairly stable from 2002-2009, ranging from 536-585 births per year. However, in 2016, the combined birth count was 452, which is 127 fewer births than seven years prior. As a result, kindergarten enrollment has declined from a high of 608 in 2008-09 to a low of 509 in 2016-17, which is not as large as the decline in the birth count. The inward migration of families with children under the age of five has reduced the potential impact of the declining birth count on the kindergarten enrollment.

Figure 11
West Windsor and Plainsboro Historical Birth Counts
2003-2016



Using mapping software, elementary school attendance area boundaries, and NJCHS birth data by Census blocks, the number of births from 2003-2016 was determined for each elementary school attendance area and is displayed in Table 9. In some instances, the address of the mother within West Windsor or Plainsboro was unknown. The greatest number of unknown births occurred in 2010, accounting for 94 of the 517 (18.2%) total births in that year. For the purposes of projecting enrollment, the unknown births were redistributed into the elementary

attendance areas using proportional allocations of the births in each school attendance area with respect to the total number of births.

For comparison purposes, Figures 12 and 13 show the number of births by elementary attendance area in 2003 and 2016. As discussed previously, there is a large section in the southwest corner of West Windsor that is not affiliated with any attendance area as it contains Mercer County Park. In addition, there are smaller areas in both townships not affiliated with an attendance area as they contain age-restricted housing developments with no school-age children. In both 2003 and 2016, the number of births was greatest in the Maurice Hawk attendance area in West Windsor and the Town Center attendance area in Plainsboro.

Table 9
Births by Elementary School Attendance Area
in the West Windsor-Plainsboro Regional School District
2003-2016

	West Windsor Township			Plainsboro Township		
Birth Year	Dutch Neck	Maurice Hawk	Unknown	Town Center	J.V.B. Wicoff	Unknown
2003	97	171	0	177	120	13
2004	78	162	1	197	114	9
2005	94	189	0	186	101	7
2006	70	164	15	169	105	13
2007	61	181	21	187	112	23
2008	70	172	18	178	110	16
2009	64	169	28	178	121	19
2010	42	139	64	129	113	30
2011	55	147	36	176	95	19
2012	59	158	38	196	89	24
2013	53	169	17	148	109	5
2014	39	137	32	166	101	18
2015	50	123	21	150	104	4
2016	40	138	23	142	105	1
Total 2003-2016	872	2,219		2,379	1,499	
Difference 2003-2016	-57	-33		-35	-15	

In both communities, births have been declining in their respective attendance areas. Figure 14 shows the differences in the birth counts by attendance area from 2003-2016. The Dutch Neck attendance area in West Windsor had the largest decline (-57) in the annual number of births over this time period. Finally, Figure 15 shows the aggregated number of births by attendance area from 2003-2016. The Town Center attendance area in Plainsboro and the Maurice Hawk attendance area in West Windsor had the largest number of births over this time period.

In addition, since there are only four elementary attendance areas in the school district, it is difficult to determine the specific location(s) where birth counts are changing. To show these locations, maps of births by census block were created for 2003 and 2016 by community and are shown in Figures 16-19. Census blocks are the smallest geographic unit in which data are collected by the Census Bureau. Blocks are typically bound by streets, roads, or bodies of water. These maps provide greater detail of the locations where most of the births are occurring. In West Windsor in 2003, the greatest number of births, which are shaded dark blue, occurred on the western border of the township, just west of Route 1, and in the center of the township, just south of County Route 638 (Clarksville Road). In 2016, the greatest number of births also occurred on the western border of the township, just west of Route 1, and in the center of the township, just south of Bear Brook Road. In Plainsboro in 2003, the greatest number of births, which are also shaded dark blue, occurred in the eastern section of the township, on both sides of County Route 614 (Dey Road). In 2016, while the greatest number of births occurred just north of Dey Road, there were fewer blocks shaded dark blue or blue (using the same scale), indicating a decline in the number of births.

In addition, births by elementary attendance area were projected for 2017 using an average, as these children will become the kindergarten class of 2022. It should be clearly stated the projected number of births does not account for future pending residential developments in West Windsor or Plainsboro, nor does it account for the additional 1,500 affordable housing units that West Windsor is required to build by 2025. Birth counts and birth-to-kindergarten survival ratios are likely to increase with new residential developments (as more families are likely to move in with children under the age of five), but there is no way of projecting what the impact will be.

Figure 12
West Windsor and Plainsboro Births by Elementary Attendance Area
2003

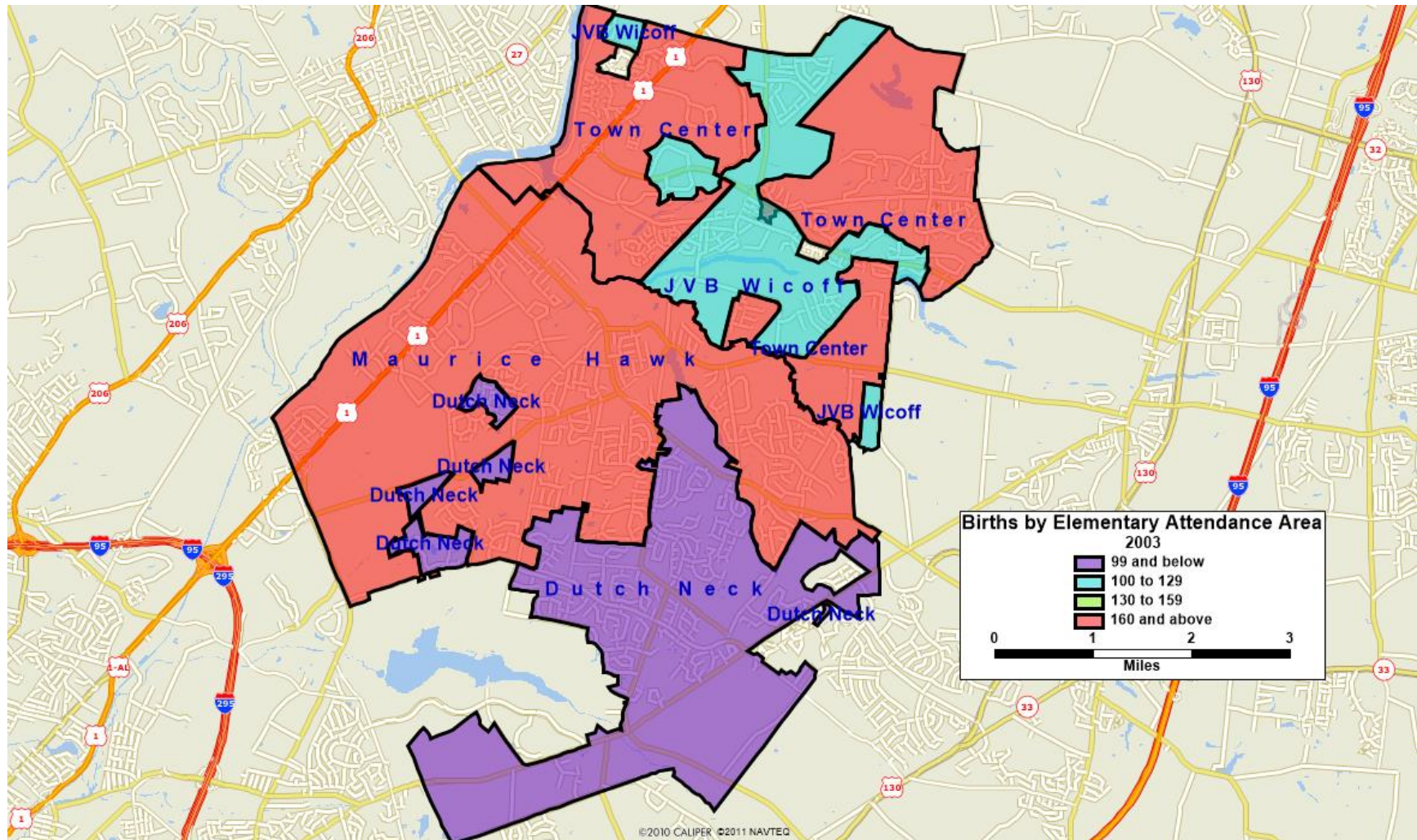


Figure 13
West Windsor and Plainsboro Births by Elementary Attendance Area
2016

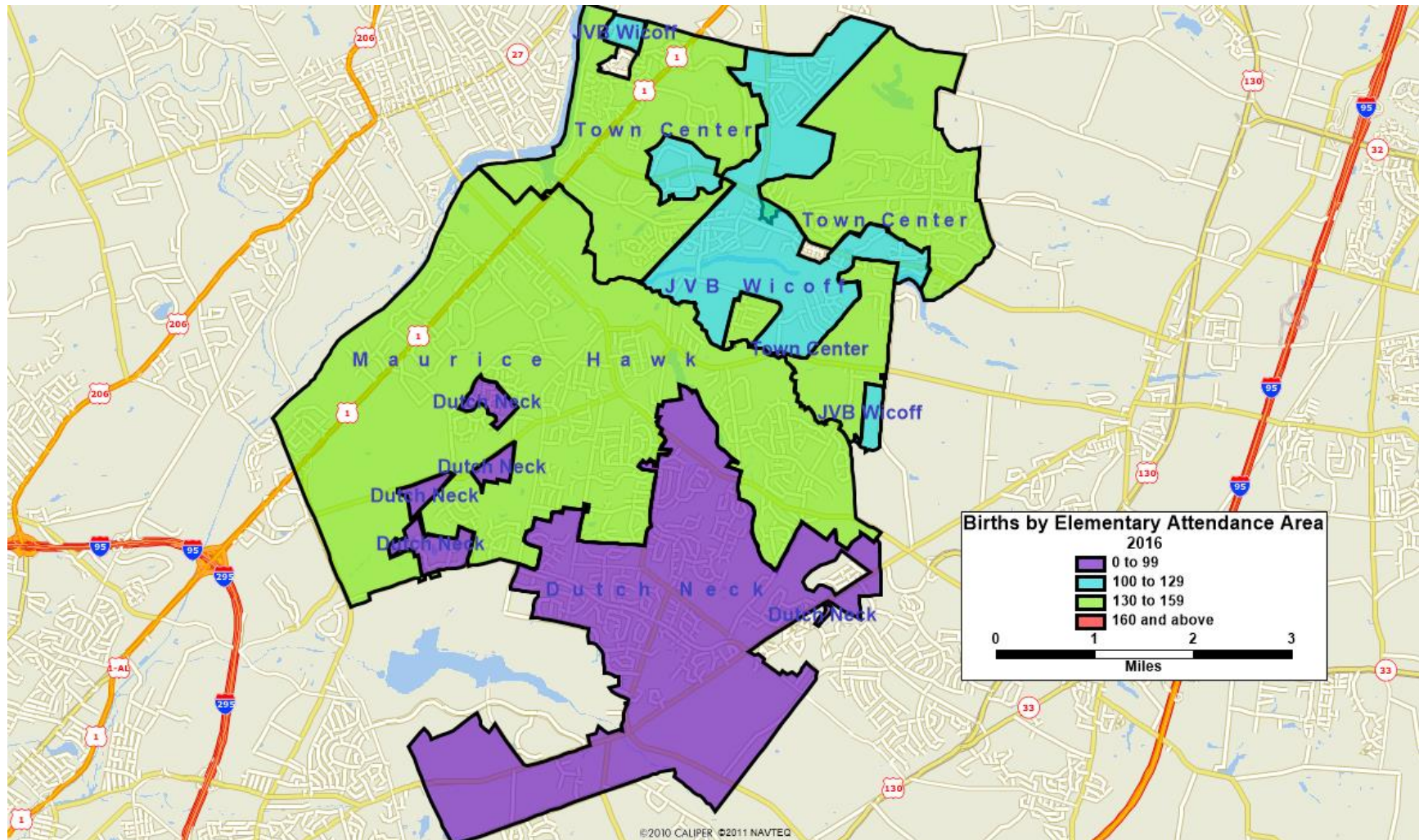


Figure 14
Change in the Number of Births by Elementary Attendance Area
2003-2016

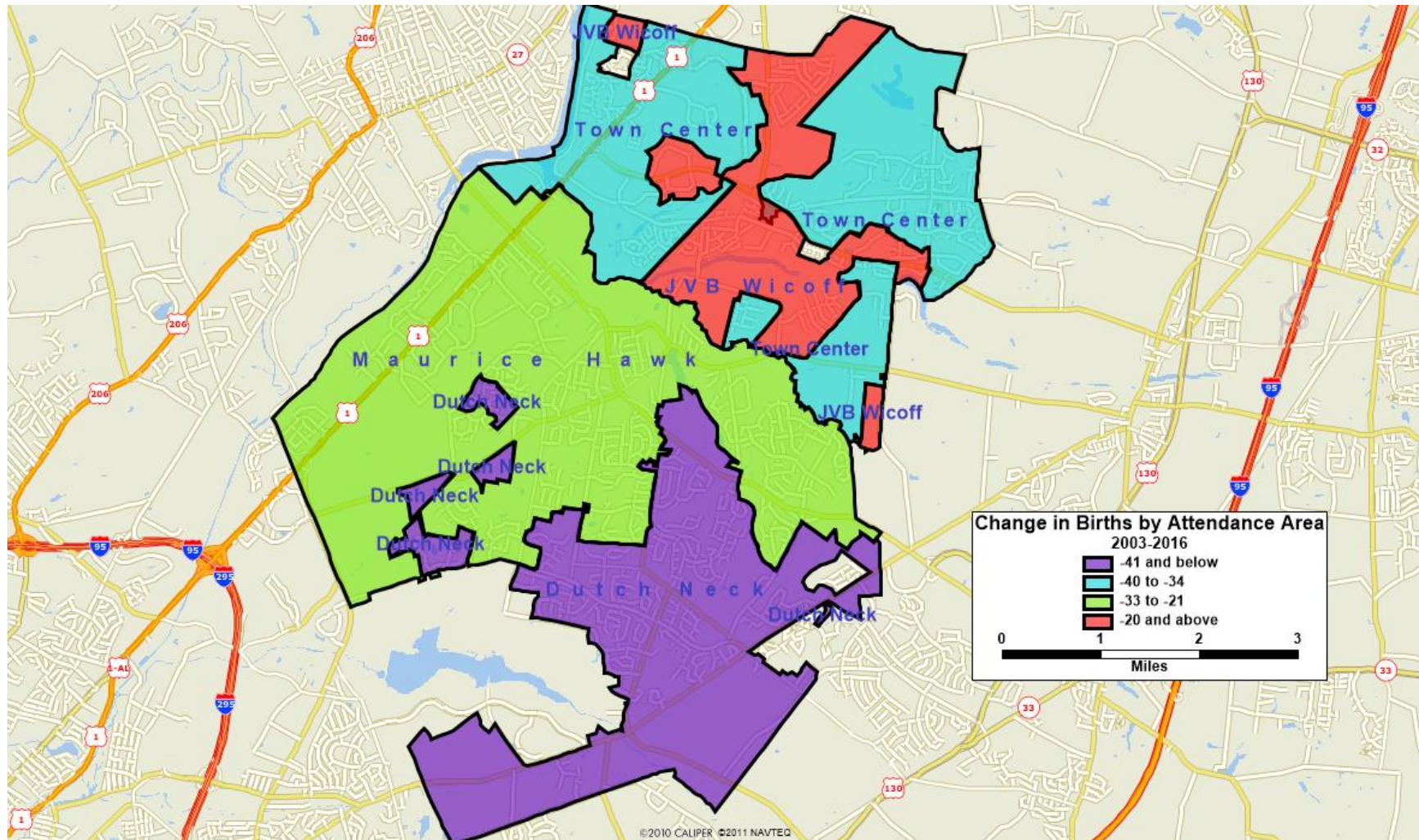


Figure 15
Total Number of Births by Elementary Attendance Area
2003-2016

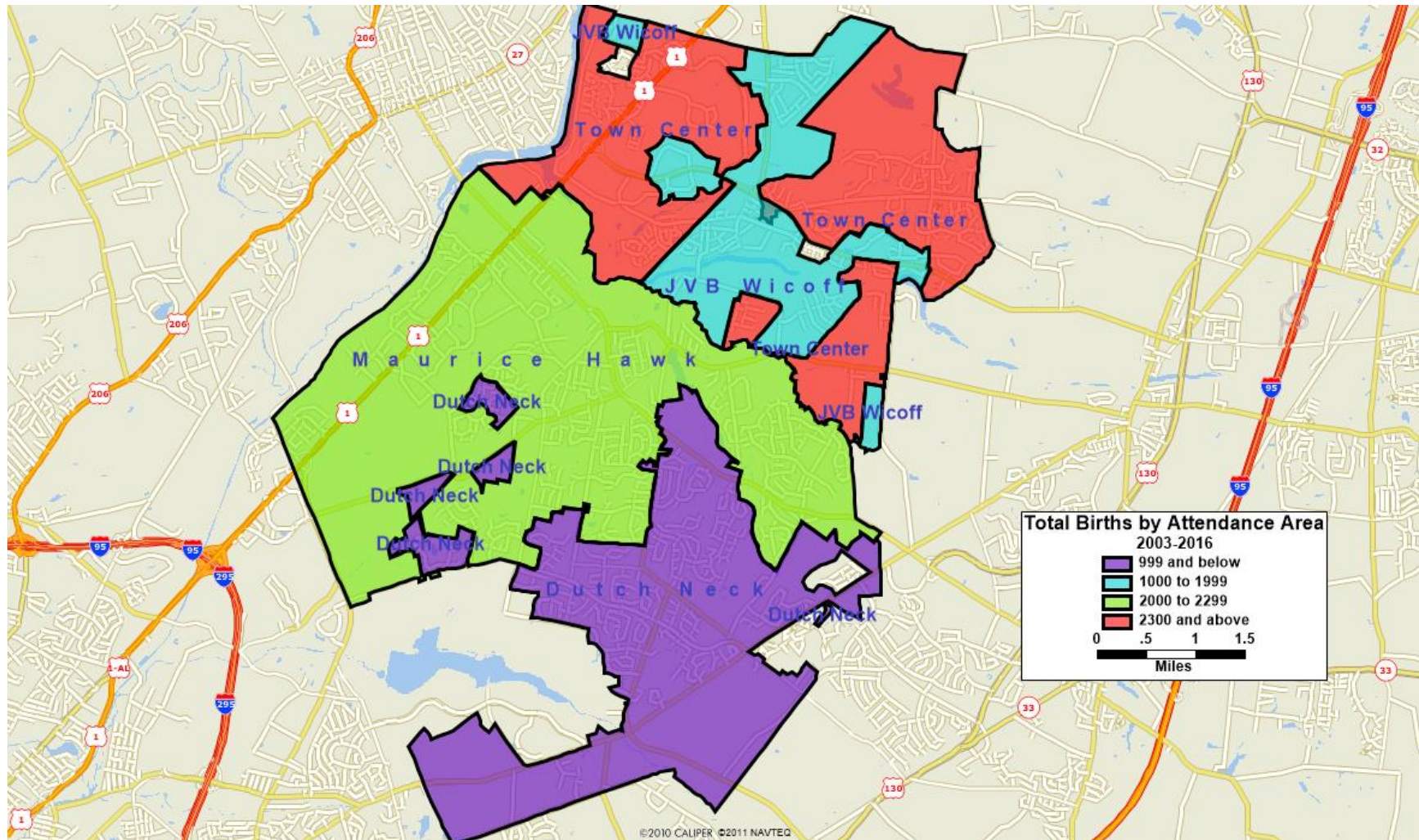


Figure 16
West Windsor Births by Census Block
2003

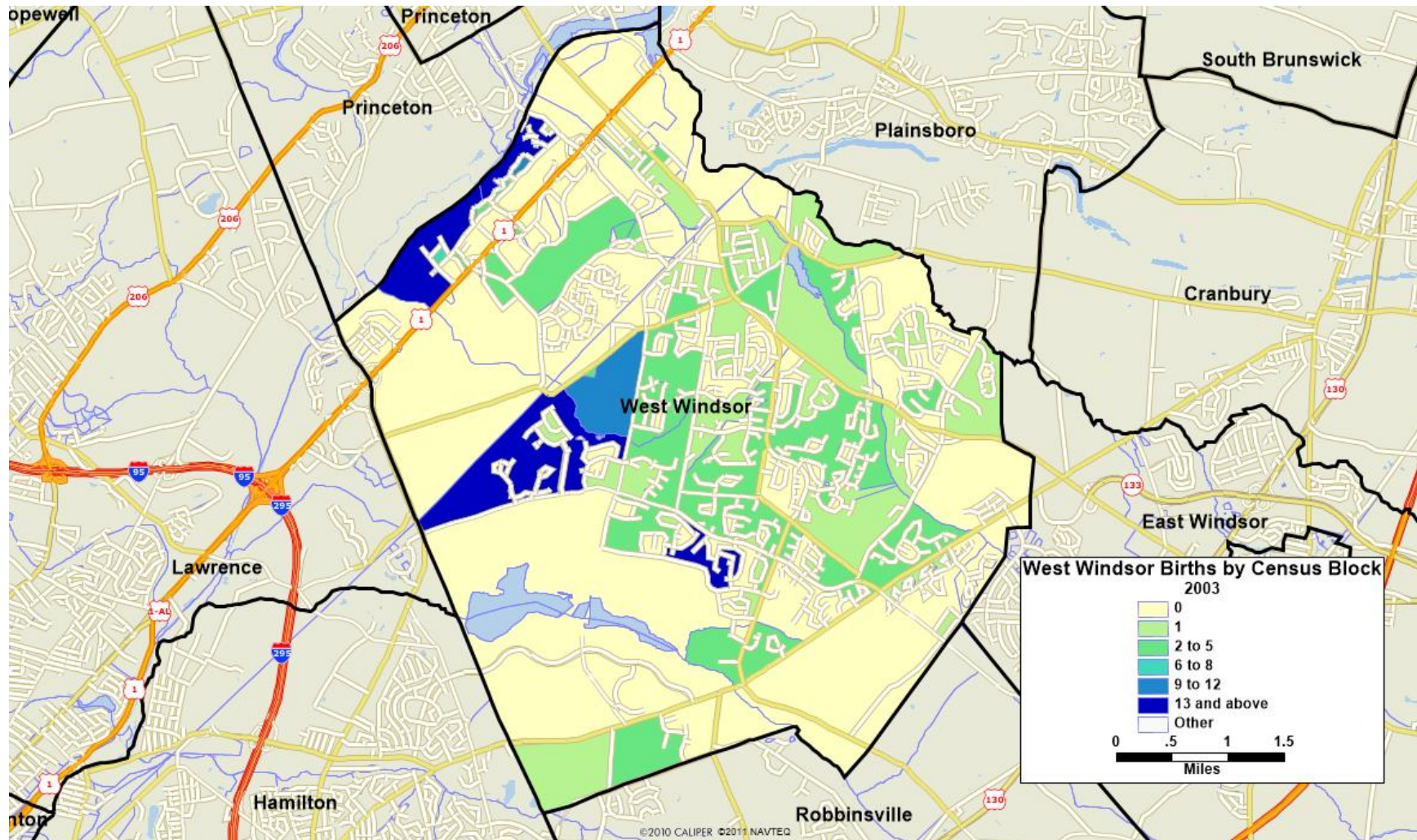
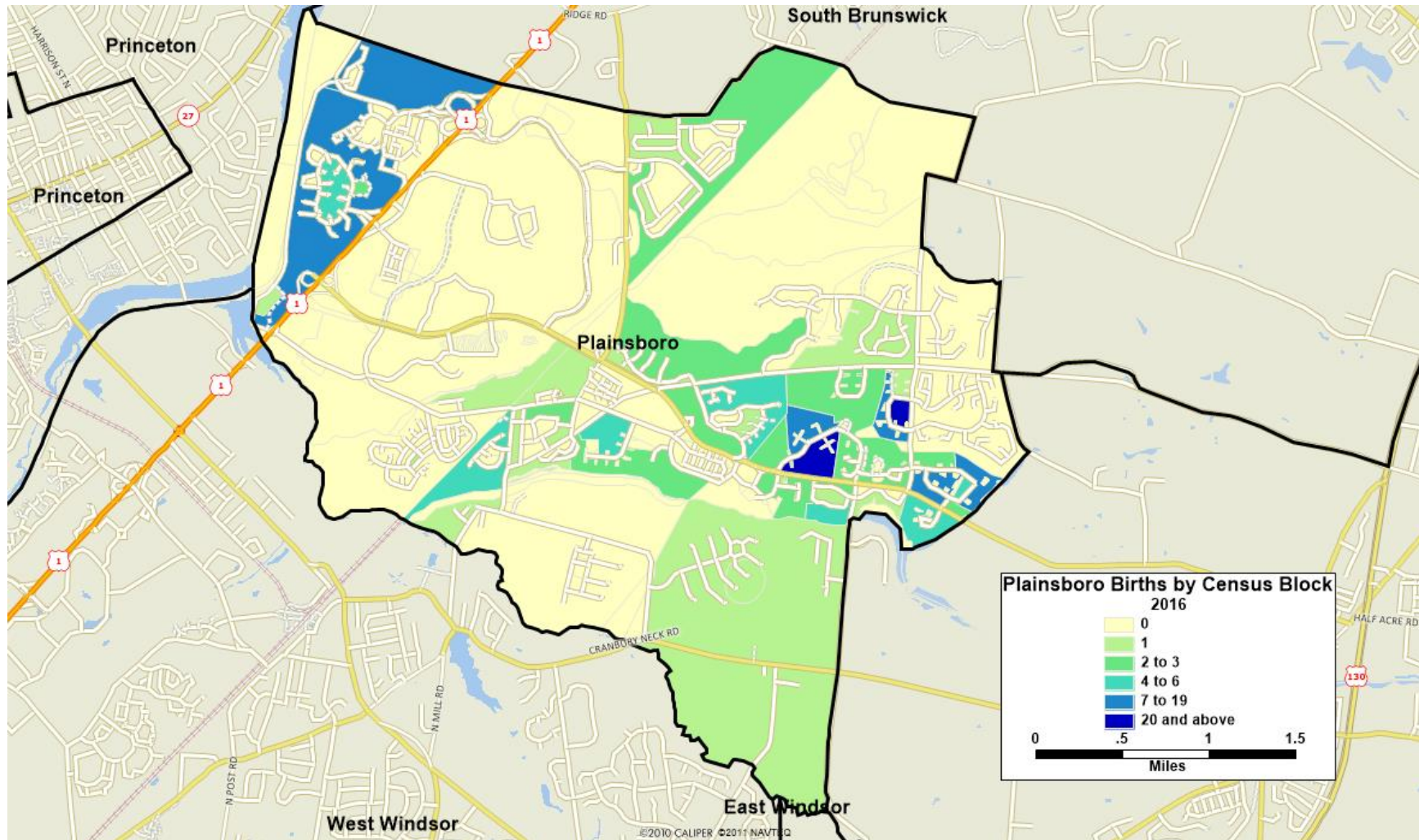


Figure 19
Plainsboro Births by Census Block
2016



Regarding fertility rates, the rates in West Windsor are lower than those of both Mercer County and New Jersey. According to the 2012-16 ACS, the fertility rate of women aged 15 to 50 in West Windsor was 43 births per 1000 women. In comparison, as reported by the NJCHS, the 2016 fertility rate in Mercer County was 56.0 births per 1,000 women (ages 15-49) and was 60.0 births per 1,000 women in New Jersey. Fertility rates in Plainsboro are also lower than those of both Middlesex County and New Jersey, but to a lesser extent. According to the 2012-16 ACS, the fertility rate of women aged 15 to 50 in Plainsboro was 50 births per 1000 women. As reported by the NJCHS, the 2016 fertility rate was 55.7 births per 1,000 women (ages 15-49) in Middlesex County and was 60.0 births per 1,000 women in New Jersey. However, it should be noted that while the municipal, county, and state 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.

Figures 20 and 21 show the age pyramids of males and females in West Windsor from both the 2000 and 2010 Censuses. The largest number of individuals in West Windsor in 2000 was aged 40-44 for both males and females. As these individuals advance in age, the largest cohort in 2010 was aged 45-49 for both genders. Table 10 shows the numerical and percentage point changes by age class in West Windsor from 2000 to 2010. Since West Windsor grew by more than 5,200 persons (+24.0%) over this time period, there were very few declines. As shown in the table, the greatest numerical declines (shaded red), occurred in the 40-44 age group for males and females. The greatest numerical gains (shaded blue) occurred in the 50-54 age group for males and 60-64 age group for females.

Figure 20
Population Pyramid of West Windsor
2000 Census

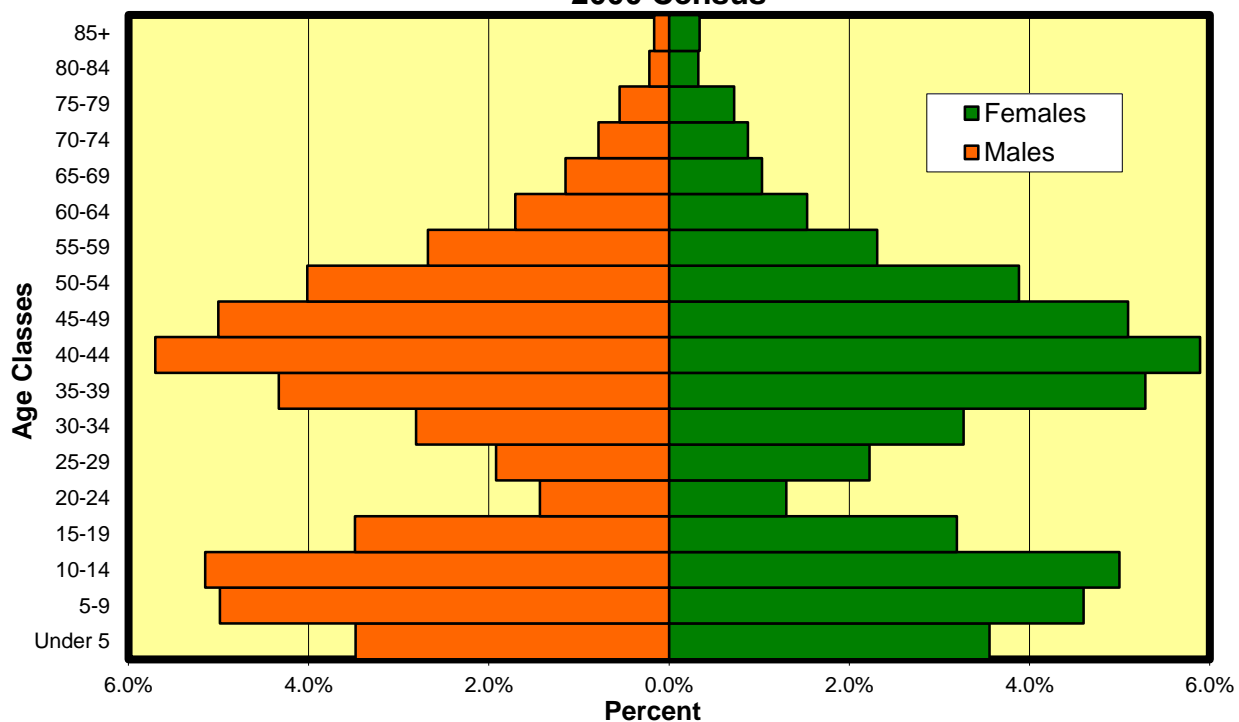


Figure 21
Population Pyramid of West Windsor
2010 Census

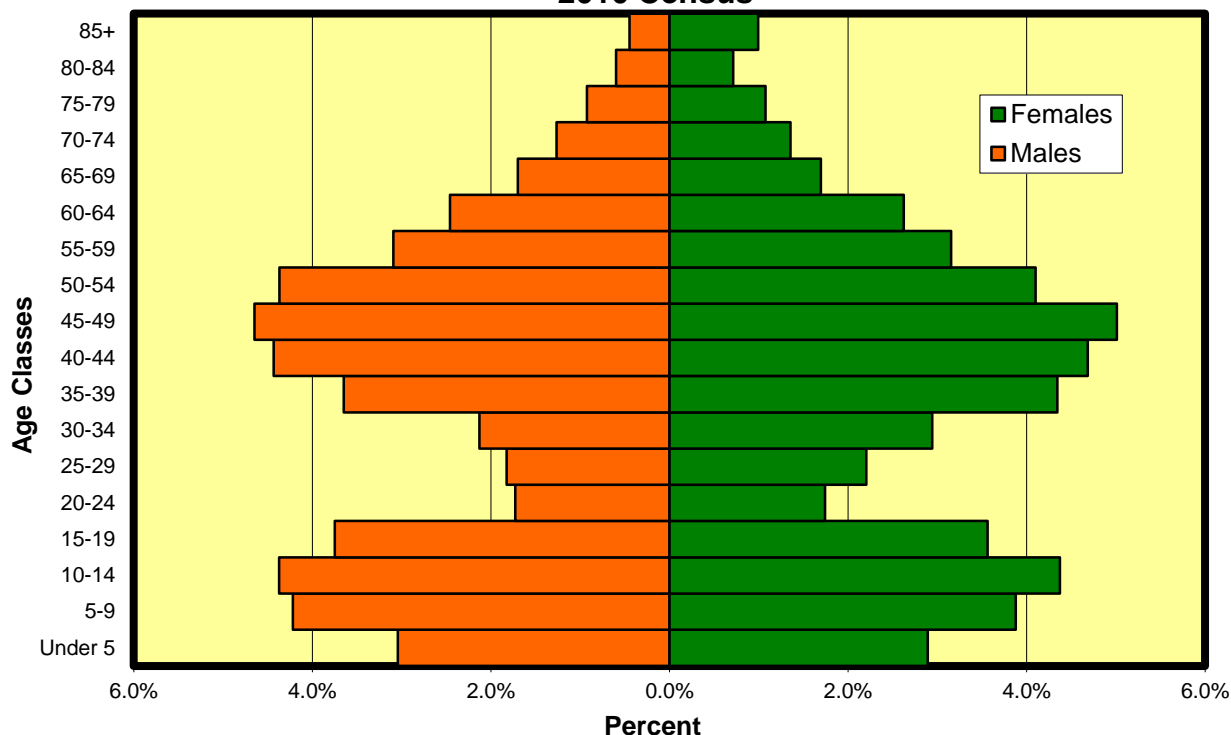


Table 10
Numerical and Percentage Point Changes of Males and Females in West Windsor

Age Group	Males		Females	
	Numerical Change	Percentage Point Change	Numerical Change	Percentage Point Change
Under 5	+65	-0.4	+7	-0.7
5-9	+54	-0.8	+46	-0.7
10-14	+60	-0.8	+93	-0.6
15-19	+254	+0.3	+268	+0.4
20-24	+155	+0.3	+188	+0.4
25-29	+74	-0.1	+112	0.0
30-34	-37	-0.7	+84	-0.3
35-39	+42	-0.7	+22	-0.9
40-44	-45	-1.3	-18	-1.2
45-49	+167	-0.4	+245	-0.1
50-54	+307	+0.4	+263	+0.2
55-59	+254	+0.4	+351	+0.8
60-64	+294	+0.8	+377	+1.1
65-69	+209	+0.5	+235	+0.7
70-74	+172	+0.5	+176	+0.5
75-79	+131	+0.4	+134	+0.4
80-84	+114	+0.4	+123	+0.4
85+	+86	+0.3	+196	+0.7

Figures 22 and 23 show the age pyramids of males and females in Plainsboro from both the 2000 and 2010 Censuses. In general, the shapes of the Plainsboro diagrams are fairly similar to those of West Windsor's. The largest cohort in Plainsboro in 2000 was aged 30-34 for males and 25-29 for females, which is much younger than the largest cohort in West Windsor in 2000. In 2010, the largest cohorts were aged 45-49 for males and 25-29 for females. Table 11 shows that the greatest declines (shaded red), both in number and percentage points, occurred in the 30-34 age group for males and 35-39 age group for females. The largest gains (shaded blue), both in number and percentage points, occurred in the 50-54 age group for males and the 60-64 age group for females. These age groups also experienced the largest gains in West Windsor.

Figure 22
Population Pyramid of Plainsboro
2000 Census

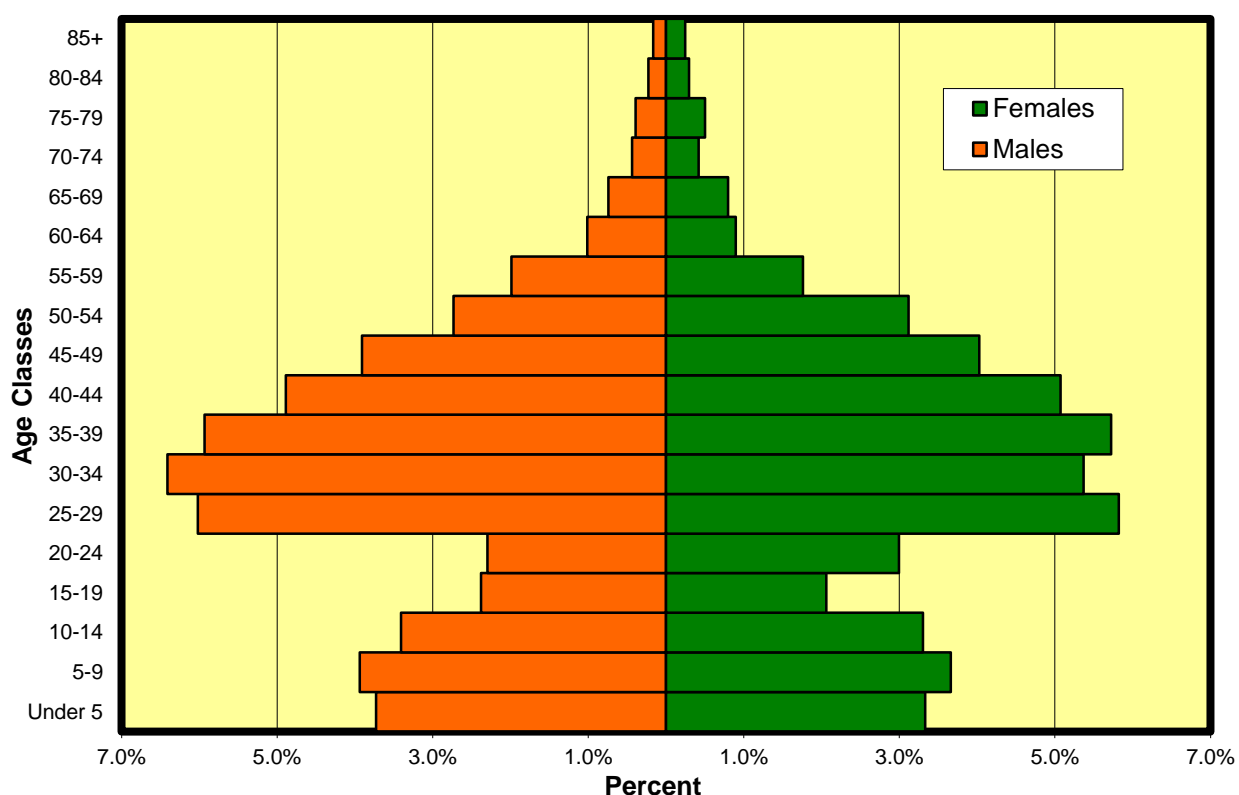


Figure 23
Population Pyramid of Plainsboro
2010 Census

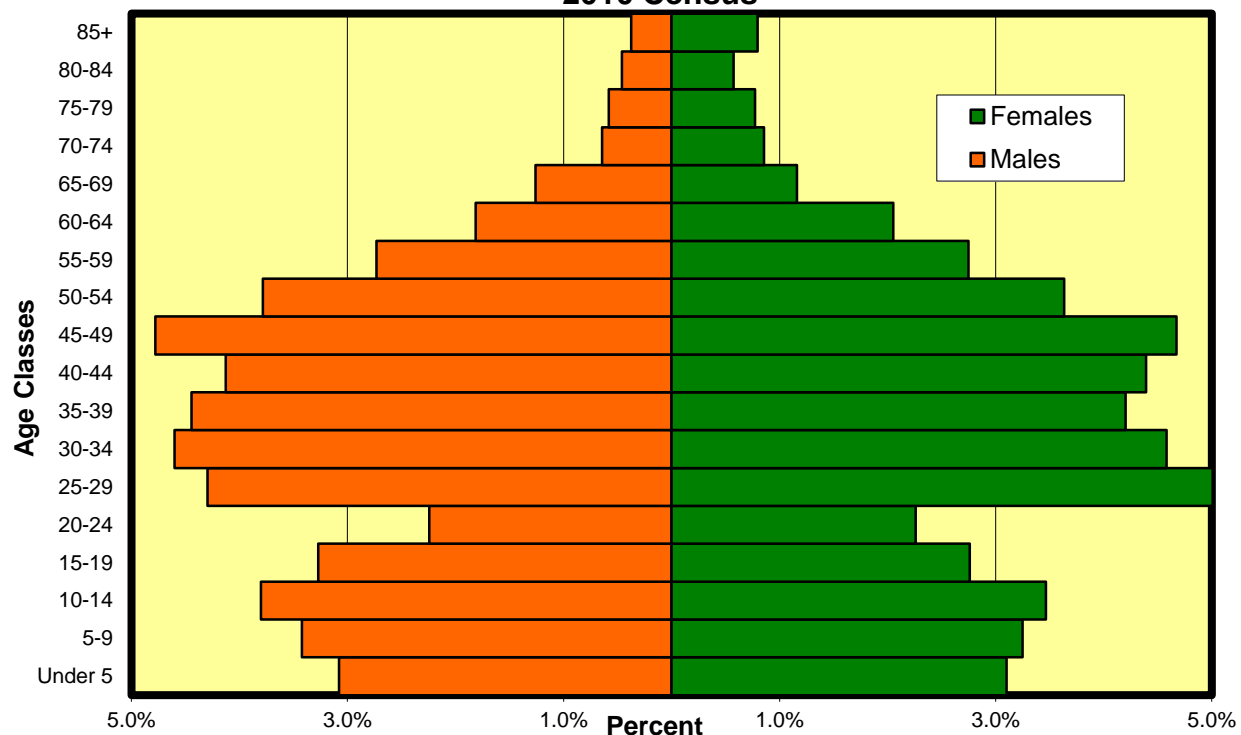


Table 11
Numerical and Percentage Point Change of Males and Females in Plainsboro

Age Group	Males		Females	
	Numerical Change	Percentage Point Change	Numerical Change	Percentage Point Change
Under 5	-46	-0.7	+39	-0.2
5-9	-9	-0.5	+7	-0.4
10-14	+185	+0.4	+129	+0.2
15-19	+271	+0.9	+218	+0.7
20-24	+52	-0.1	-85	-0.7
25-29	-229	-1.7	-25	-0.8
30-34	-238	-1.8	-31	-0.8
35-39	-177	-1.5	-190	-1.5
40-44	-39	-0.8	-15	-0.7
45-49	+309	+0.9	+261	+0.6
50-54	+318	+1.1	+206	+0.5
55-59	+226	+0.7	+276	+1.0
60-64	+212	+0.8	+291	+1.2
65-69	+140	+0.5	+106	+0.4
70-74	+60	+0.2	+112	+0.4
75-79	+55	+0.2	+77	+0.3
80-84	+60	+0.2	+72	+0.3
85+	+53	+0.2	+133	+0.5

New Housing

1. West Windsor Township

The West Windsor Division of Land Use and the West Windsor-Plainsboro Regional School District provided information regarding developments under construction and planned residential developments in the community. A list of developments and planned number of new housing units is shown in Table 12. A total of 664 housing units are planned in West Windsor. Age-restricted housing developments were excluded from the table, as they should have no impact on the school district's enrollment.

Of the proposed new housing, the largest development is Woodstone at Princeton, which would consist of a mix of 443 market-rate and affordable apartment units on Canal Pointe Boulevard. The second-largest planned development is the Maneely Property (developed by Toll Brothers) and will consist of 163 units that will be a mix of 51 townhouses, 40 apartment units over retail stores, and 72 affordable housing units. This development is also proposing to construct 192 short-term stay corporate suites. These are not included in the total count as they are not expected to have students. The remaining four developments in Table 12 are much smaller and do not exceed 25 units in any of the individual projects.

In March 2018, the Mercer County Superior Court judge ruled that West Windsor is required to build 1,500 affordable housing units by 2025. **Due to the uncertainty of how the township will specifically meet its obligation and the timeline to do so, this ruling was not considered in the impact of new housing on the enrollment projections.**

In addition, Table A1 in the Appendix lists potential residential developments in West Windsor. These developments, which had unknown bedroom distributions, have not been approved and are in the very early stages of planning. Due to the uncertainty of whether these developments will ever be constructed, they are not discussed here. However, the potential impact on the school district is discussed in the Appendix.

Student Yield Analysis of Detached Single-Family Homes

To determine the number of children per housing unit (student yield) of all detached single-family homes in West Windsor, the township's parcel-level database (excluding townhouses, condominiums, duplexes, and apartments) was joined to the school district's 2016-17 student database. A total of 5,648 detached single-family homes were identified. Student yields by housing development for detached single-family homes in 2016-17 are shown in Table 13 and compared to the student yields in 2011-12 as previously shown in the January 2013 demographic study. As the student yields are a snapshot in time, they can change on an annual basis. In 2011-12, the average student yield for detached single-family homes was 0.73. However, in 2016-17, that value has declined to 0.69. In general, developments that were built more recently contain the most children. As a house ages, and assuming the home is not sold, children graduate from the school district, which reduces the student yield in the development.

Table 12
Planned Residential Developments in West Windsor

Subdivision/ Developer	Attendance Areas	Location	Number of Units	Bedroom Distribution	Housing Type	Notes
Woodstone at Princeton	MH-VIL- GMS-HSS	Canal Pointe Boulevard	443	1-3 BR (mix unknown)	Apartments, Market-rate and affordable	To be located on land owned by Princeton Theological Seminary. Rental apartments will have 354 market-rate units and 89 affordable units. Anticipated approval in Spring 2018. 3-4 year expected buildout. Students expected in 2020.
Toll Brothers (Maneely Property)	MH-VIL- GMS-HSS	Bear Brook Road/Old Bear Brook Road	163 (51 TH, 40 APTS above retail, 72 affordable APTS)	3-BR (TH) N/A (APT over Retail) 14 1-BR, 42 2-BR, 16 3- BR (affordable APT)	Townhouse Apartments, Market-rate and affordable	Has received final approval. Students expected in 2018. Project includes 40 apartments above retail, six that will be affordable. Project also includes 192 short-term stay corporate suites (not included in overall unit count). Affordable rental units are for disabled residents (Project Freedom).
Ellsworth Center	MH-VIL- GMS-HSS or MH-VIL- CMS-HSN	Cranbury Road/Princeton- Hightstown Road	20	1-BR (MR APTS) Affordable mix unknown	Apartments, Market-rate and affordable	Has received final approval. Students expected in 2019. Rental apartments will have 16 market-rate units and 4 affordable units
Cherry Grove	MH-VIL- GMS-HSS	Ward Road	6	N/A	Single-Family	Preliminary/final major subdivision pending
Bear Brook Homes LLC	MH-VIL- GMS-HSS	Bear Brook Road	8	N/A	Single-Family	Preliminary major subdivision pending
Princeton Ascend	MH-MR- GMS-HSS	43 Princeton- Hightstown Road	24	N/A	Apartments, Townhouse	Rental apartments (17) will have 12 market-rate units and 5 affordable units. Seven townhouse units to be located above office space.
Total		664 Housing Units				

Sources: West Windsor Township Division of Land Use and the West Windsor-Plainsboro Regional School District

Table 13
West Windsor Student Yields by Detached Single-Family Home Developments

Development	Number of Units	Number of Students ¹	Year Built	2011-12 Student Yield	2016-17 Student Yield
Benford Estates	76	37	1969, some in 1980s	0.55	0.49
Berrien City	140	62	1920s, some back to 1895	0.45	0.44
Birchwood	61	32	Early 1970s	0.69	0.52
Brookline Estates	41	45	1999	1.29	1.10
Brookshyre Estates (I and II)	67	39	Early 1990s	1.09	0.58
Brookside	57	42	1988	0.86	0.74
Chamberlin Estates	16	16	1999-2000	1.19	1.00
Charter/Heritage Club	208	130	1985	0.65	0.63
Colonial Park	100	44	1960s	0.50	0.44
Crown Pointe	95	79	1997-2000	1.07	0.93
Dey Farm Estates	10	2	Built between 1988-2002	0.20	0.20
Dutch Neck Estates	95	74	1985	1.02	0.78
Estates at Princeton Junction	400	444	2005-2006	1.03	1.11
Glen Acres	12	4	Late 1950s	0.42	0.33
Golf View Manor	19	17	1976	1.00	0.89
Grande Preserve	40	28	1996-1997	1.08	0.70
Grovers Mill Estates	102	67	1980	0.55	0.66
Heatherfield	90	78	1989-1990	0.99	0.87
Heatherfield West	45	25	1993	0.82	0.56
Hunters Run	132	76	1994-1995	0.91	0.58
Jefferson Park	103	55	1960s	0.63	0.53
Kings Mill	28	18	1988	0.82	0.64
Kings Point	158	116	1989	0.71	0.73
Kings Point East	31	24	1992	0.81	0.77
Le Parc I	114	80	1986	0.80	0.70
Le Parc II	53	37	1987	0.62	0.70
Long Meadow	68	55	1971	0.74	0.81
Meadows of Windsor Hunt	25	24	1990-1993	0.80	0.96
Mill View Manor	23	14	Early 1980s	0.43	0.61
Millbrook	100	75	1988	0.93	0.75
Old Mill Farms	64	45	1967	0.78	0.70
Penns Neck	106	30	1950	0.42	0.28
Princeton Chase	109	89	1985-1986	0.69	0.82
Princeton Ivy East	113	84	1973	0.69	0.74
Princeton Ivy Estates	120	90	1965	0.70	0.75
Princeton Oaks	257	174	Late 1980s, early 1990s	0.74	0.68
Princeton View	99	66	1984-1986	0.80	0.67
Sherbrooke Estates	112	76	1970	0.66	0.68
Southfield Meadows	90	52	1995	1.18	0.58
Stony Brook	92	71	1986	0.68	0.77
Sunrise (I and II)	85	40	1985, 1988	0.58	0.47
Waterford Estates	66	70	1994-1995	1.04	1.06
Wellington Estates	96	71	Built in 1970s and 1980s	0.73	0.74
Westwinds	69	39	1987	0.46	0.57
West Windsor Estates	99	85	1987	0.98	0.86
Westminster Estates	26	11	1990, 1991	0.42	0.42
Windsor Chase	38	27	1986	0.70	0.71
Windsor Crossing	39	26	1997, 1998	0.77	0.67
Windsor Estates	20	10	Late 1950s	0.79	0.50
Windsor Green	95	65	Built in 1970s and 1980s	0.53	0.68
Windsor Hunt	145	112	1988	0.85	0.77
Windsor Park Estates	134	96	1989	0.95	0.72
Windsor Ridge	33	22	1990	0.67	0.67
Woods at Millbrook	29	17	1993	0.72	0.59
Misc. West Windsor Homes	1,003	568	N/A	0.46	0.57
Total	5,648	3,875		0.73	0.69

Note: ¹Based on 2016-17 enrollment

While dividing the total number of school children by the total number of homes is the simplest way to compute student yields, the main drawback of this computation is that the student yield includes homes owned by all age segments of the population, such as empty-nesters and senior citizens, which would lower the overall student yield. Yields computed in this fashion are likely underestimating the future number of children in proposed developments or from home resales, where families with children are likely to be the buyers.

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

To determine length of ownership, parcel-level records of all detached single-family homes in West Windsor were downloaded from the Monmouth County Tax Board² database. Besides the property address, other variables include block and lot, sale dates and prices, and in most instances, the year that the home was built. Since student yields by length of ownership were analyzed, it was necessary to know the year of the most recent sale. Determining the most recent sale date was not always obvious. Some of the most recent sale dates had a sales price of \$1 or \$100. These "paper sales" were coded as a non-usable deed transaction. These transactions include sales between members of the immediate family, resulting in a change in title but often not a change of the occupant. In these instances, the data were excluded from the analysis and the next most recent sale date was used instead.

One of the limitations of the database was the lack of recorded sales prior to 1978. Since many of the homes have never been sold since 1978, the earliest sale date recorded, the length of ownership exceeded 38 years (using data through 2016) but the exact length of ownership was unknown. The community also had many homes constructed after 1978 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 2016.

² The Monmouth County database provides information for all municipalities in the state.

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

Table 14 following shows the student yields by length of ownership for the PK-12 student population (public school students only). It is expected that longer-held homes will have fewer children, as they would have graduated from the district.

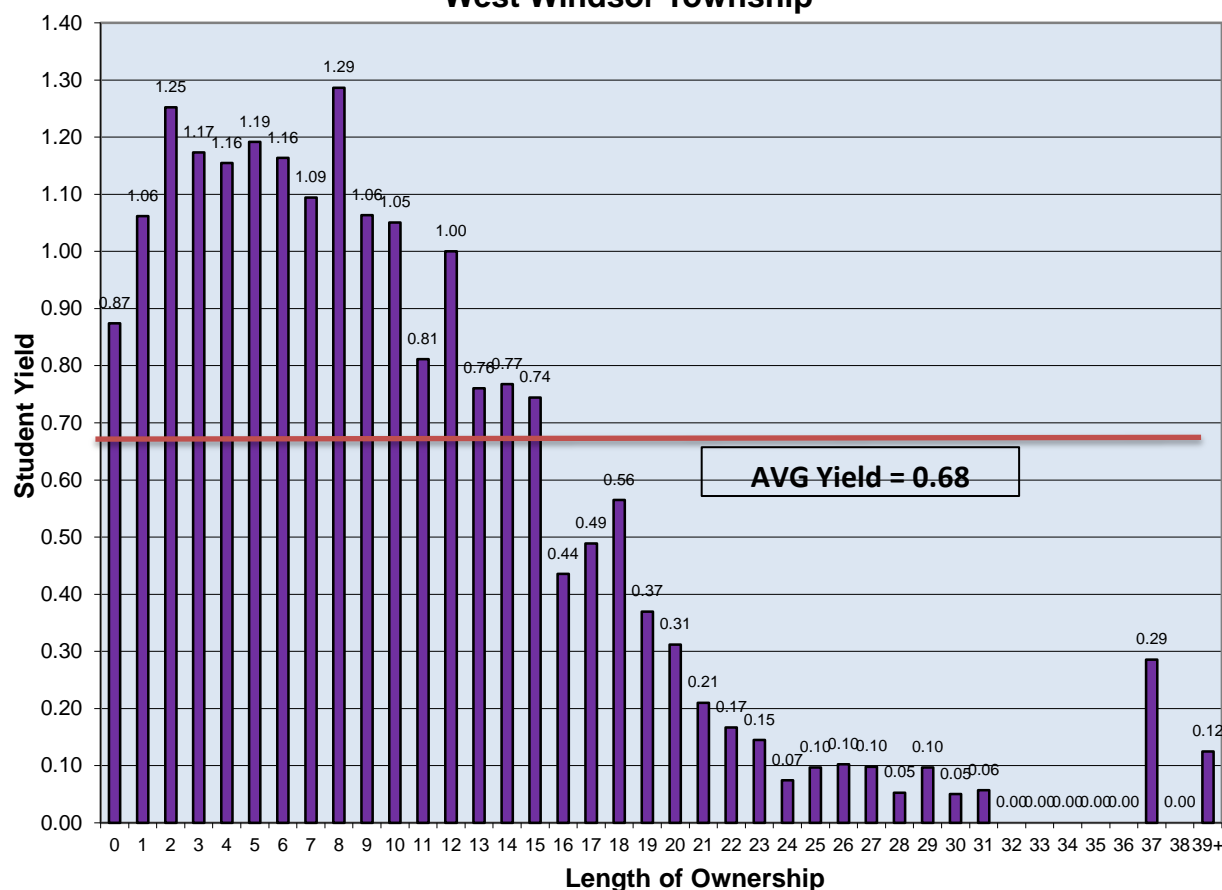
Table 14
Student Yields by Current Length of Ownership in West Windsor
Detached Single-Family Homes

Years of Ownership	Housing Units	Students in 2016-17	Student Yield
0	247	216	0.87
1	242	257	1.06
2	238	298	1.25
3	242	284	1.17
4	200	231	1.16
5	172	205	1.19
6	171	199	1.16
7	159	174	1.09
8	199	256	1.29
9	204	217	1.06
10	218	229	1.05
11	228	185	0.81
12	187	187	1.00
13	163	124	0.76
14	155	119	0.77
15	133	99	0.74
16	179	78	0.44
17	182	89	0.49
18	177	100	0.56
19	157	58	0.37
20	109	34	0.31
21	138	29	0.21
22	120	20	0.17
23	131	19	0.15
24	108	8	0.07
25	93	9	0.10
26	117	12	0.10
27	102	10	0.10
28	76	4	0.05
29	93	9	0.10
30	100	5	0.05
31	70	4	0.06
32	5	0	0.00
33	3	0	0.00
34	10	0	0.00
35	8	0	0.00
36	16	0	0.00
37	7	2	0.29
38	4	0	0.00
39+	482	60	0.12
Total	5,645	3,830	0.68³

³ Some students could not be matched to a unique address, leading to the slightly different average student yield as compared to Table 13.

Figure 24 shows that, in general, student yields slowly increase with length of ownership, peaking at 1.29 children per housing unit with eight (8) years of ownership. Student yields then decline as length of ownership increases. After 20 years of ownership, student yields are typically below 0.20 children per home. While there is a yield that exceeds 0.20 at 37 years of ownership, there are few homes at that length of ownership, and just a few students can greatly influence the magnitude of the student yield.

Figure 24
Student Yields by Length of Ownership
Detached Single-Family Homes
West Windsor Township



Since the length of ownership is a distribution, how can one determine what is the likely student yield in a home resale or newly constructed unit? Since the distribution is a snapshot in time, what is a reasonable student yield to use? Computing the average over the entire length of ownership period underestimates the number of children, since there are so few children at longer lengths of ownership as children graduate from the school district. Unfortunately, there is no research-based metric to determine what part of the distribution should be used to estimate future schoolchildren. Instead, we propose computing an average using all of the years up to the peak student yield, which estimates the maximum impact before student yields begin to decline. As discussed above, the average student yield (0.68) computed from the entire housing stock likely underestimates the actual student yield when a family either moves into a new home or a

resale. If an average student yield is computed for the first eight years of ownership when the peak student yield occurs, the yield increases to 1.13. This is likely a better estimate of the student yield of detached single-family homes in West Windsor.

Student Yield Analysis for Townhouses and Condominiums

Student yields were also computed for townhouses and condominiums in West Windsor by joining the township's parcel-level database with student addresses from the 2016-17 year. Lengths of ownership were not computed as there is a lot of variation of the student yields based on the development's bedroom distribution and whether it has child-friendly amenities, such as a playground or swimming pool. Student yields by housing development for townhouses and condominiums in 2016-17 are shown in Table 15 and compared to the student yields in 2011-12 as previously shown in the January 2013 demographic study. A total of 1,699 units were identified in six (6) separate developments. Student yields were largest in Estates at Princeton Junction (0.85) and Windsor Ponds (0.80), which are newer developments. The overall student yield for townhouses and condominiums in West Windsor was 0.51, which is virtually unchanged from 2011-12.

Table 15
West Windsor Student Yields for Condominiums and Townhouses

Development	Year Built	Bedrooms	Number of Units	Number of Students¹	2011-12 Student Yield	2016-17 Student Yield
Canal Point	1989	2-3	621	238	0.40	0.38
Colonnade Point	1989	2	252	71	0.18	0.28
Estates at Princeton Junction	2006	3	130	110	0.82	0.85
Princeton Green	1992	2-3	143	77	0.51	0.54
Windsor Haven²	1992	2-4	183	77	0.28	0.42
Windsor Ponds²	2002	2-4	370	297	0.85	0.80
Total			1,699	870	0.50	0.51

Note: ¹Based on 2016-17 enrollment

²Contains a mix of market-rate and affordable units

Student Yield Analysis for Apartments

In addition, student yields were computed for apartment complexes in West Windsor. Student yields by housing development for apartments in 2016-17 are shown in Table 16 and compared to the student yields in 2011-12 as previously shown in the January 2013 demographic study. The table is not an all-inclusive list of all apartment units, as it only includes large apartment complexes. A total of 1,838 units were identified in five (5) separate developments. Student yields were largest in Princeton Terrace (0.81) and Windsor Woods (0.71). The overall student yield for apartment units in West Windsor was 0.53, which is slightly higher than 2011-12 (0.50).

Table 16
West Windsor Student Yields for Apartments

Development	Year Built	Bedrooms	Number of Units	Number of Students¹	2011-12 Student Yield	2016-17 Student Yield
Avalon Watch²	1988	1-3	512	183	0.37	0.60
Princeton Terrace²	2012-2015	2	465	378	0.46	0.81
Princeton Theological Seminary	2012	1-3	200	33	N/A	0.17
The Mews at Princeton Junction²	2006	1-3	461 ²	247	0.56	0.54
Windsor Woods²	1983	1-3	200	142	0.74	0.71
Total			1,838	983	0.50	0.53

Note: ¹Based on 2016-17 enrollment

²Contains a mix of market-rate and affordable units

2. Plainsboro Township

The Plainsboro Planning and Zoning Department and the Windsor-Plainsboro Regional School District provided information regarding developments under construction and planned residential developments in the community. A list of developments and planned number of new housing units is shown in Table 17. A total of 498 housing units are planned in Plainsboro. Age-restricted housing developments (e.g., Riverview at Princeton) were excluded from the table, as they should have no impact on the school district's enrollment.

The largest development, Princeton Forrestal Village, would consist of 344 market-rate and 50 affordable apartment units, totaling 394 units.

A second development, Place at Plainsboro, is scheduled to begin construction in spring 2018 and will consist of 100 affordable apartment units in a mix of 1-3 bedrooms. Construction will occur in two phases with 70 units being built in the first phase and 30 units in the second phase.

Finally, a small development, Princeton Glen, is currently under construction and will consist of four (4) detached single-family homes. Two of the homes are under construction.

Student Yield Analysis of Detached Single-Family Homes

To determine the number of children per housing unit (student yield) of all detached single-family homes in Plainsboro, the township's parcel-level database (excluding townhouses, condominiums, duplexes, and apartments) was joined to the school district's 2016-17 student database. A total of 2,321 detached single-family homes were identified. Student yields by housing development for detached single-family homes in 2016-17 are shown in Table 18 and compared to the student yields in 2011-12 as previously shown in the January 2013 demographic study. As discussed previously, student yields are a snapshot in time as they can change on an annual basis. In 2011-12, the student yield for detached single-family homes was 0.88. However, in 2016-17, that value has declined to 0.72. In general, developments that were built more recently contain the most children. As a house ages, and assuming the home is not sold, children graduate from the school district, which reduces the student yield in the development.

Like West Windsor, 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. To determine length of ownership, parcel-level records of all detached single-family homes in Plainsboro were downloaded from the Monmouth County Tax Board database. Sale dates for each home were used to compute length of ownership, excluding paper sales. Like West Windsor, there was a lack of recorded sales prior to 1978. Since many of the homes have never been sold since 1978, the earliest sale date recorded, the length of ownership exceeded 38 years (using data through 2016) but the exact length of ownership was unknown. The community also had many homes constructed after 1978 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 2016.

Table 17
Planned Residential Developments in Plainsboro

Subdivision/ Developer	Attendance Areas	Location	Number of Units	Housing Type	Bedroom Distribution	Notes
Princeton Forrestal Village	WC-MR- CMS-HSN	College Road West	394	Apartments, Market-rate and affordable	Market-Rate 20 Studios 219 1-BR 105 2-BR Affordable 10 1-BR 30 2-BR 10 3-BR	Rental apartments will have 344 market-rate units and 50 affordable units. Received final subdivision and site plan approval in 2014.
Princeton Glen Homes	WC-MR- CMS-HSN	Schalks Crossing Road and Perrine Road (Mimosa Court)	4	Single-Family	N/A	Two homes are currently under construction.
Place at Plainsboro	WC-MR- CMS-HSN	Dey Road	100	Affordable Apartments	Phase I 14 1-BR 34 2-BR 22 3-BR Phase II 6 1-BR 14 2-BR 10 3-BR	Received preliminary/ final subdivision and site plan approval in March 2017. Construction to begin March 2018. To be constructed in two phases with 70 units in Phase I and 30 units in Phase II. Will consist of 13 buildings containing 6-8 units each in a two-story townhouse design.
Total	498 Housing Units					

Sources: Plainsboro Planning and Zoning Department and the West Windsor-Plainsboro Regional School District

Table 18
Plainsboro Student Yields by Detached Single-Family Home Developments

Development	Year Built	Number of Units	Number of Students¹	2011-12 Student Yield	2016-17 Student Yield
Beechwood Estates	Late 1970s and 1980	33	16	0.84	0.48
Brentwood Estates	1994	16	8	0.75	0.50
Crossings at Grovers Mill East	1997	179	130	1.08	0.73
Estates at Plainsboro	2002-2004	80	68	1.31	0.85
Gentry	1989	343	240	0.83	0.70
Jefflands	Late 1980s to mid-1990s	13	10	0.92	0.77
Plainsboro Village	2004	51	42	1.05	0.82
Ponds End	1988	49	34	1.00	0.69
Princeton Collection	1979-1980	419	285	0.70	0.68
Princeton Crossing	1991	162	135	0.90	0.83
Princeton Glen at Plainsboro	2012	5	5	N/A	1.00
Princeton Manor	1992	114	63	0.64	0.55
Serina Drive	1998-1999	8	5	1.25	0.63
Shallowbrook Estates	1998	37	28	0.96	0.76
Walker Gordon Farm	1998-2002	355	336	1.14	0.95
Windmere Grove	2004	55	45	1.05	0.82
Windy Brook	1990	15	11	0.47	0.73
Woods at Plainsboro	N/A	10	12	1.00	1.20
Plainsboro Homes Not in Developments	N/A	377	209	0.67	0.55
Total		2,321	1,682	0.88	0.72

Note: ¹Based on 2016-17 enrollment

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

Table 19 following shows the student yields by length of ownership for the PK-12 student population (public school students only) in Plainsboro. It is expected that longer-held homes will have fewer children, as they would have graduated from the district.

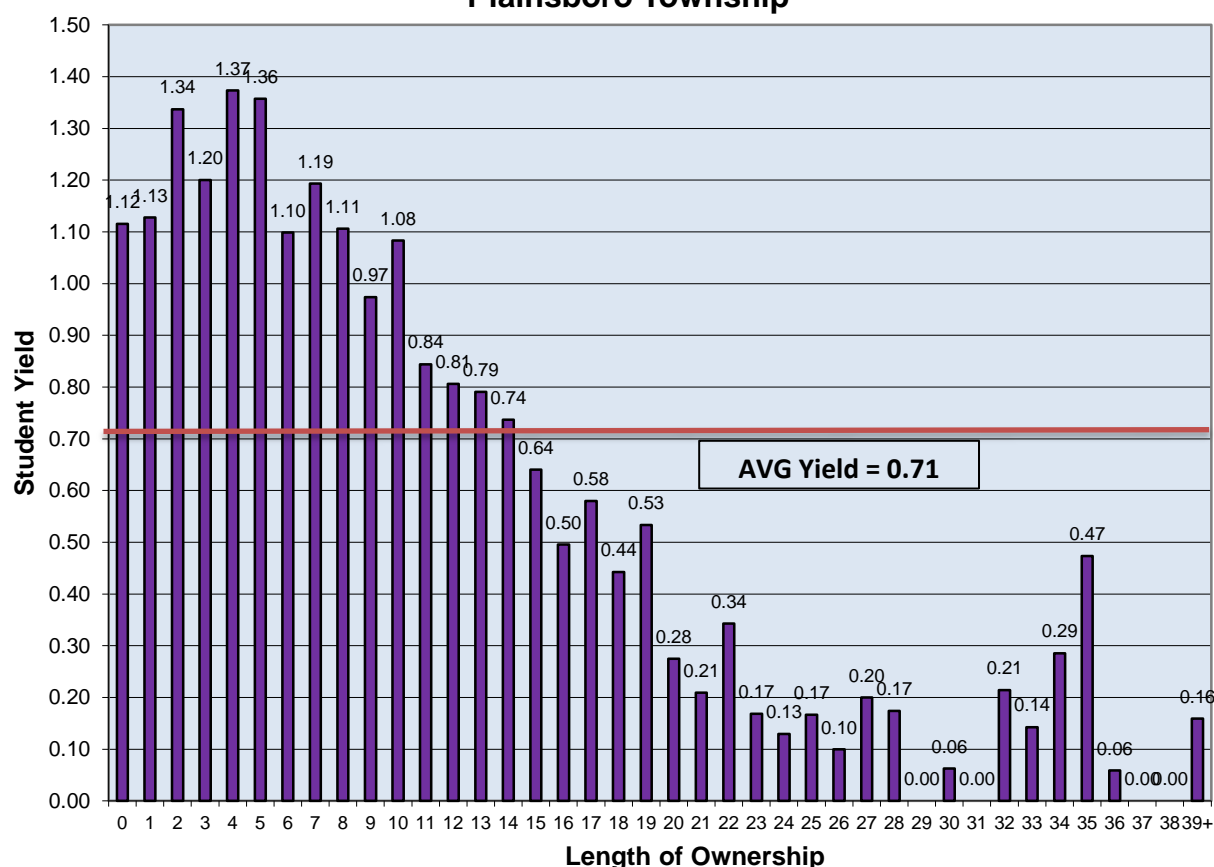
Table 19
Student Yields by Current Length of Ownership in Plainsboro
Detached Single-Family Homes

Years of Ownership	Housing Units	Students in 2016-17	Student Yield
0	104	116	1.12
1	86	97	1.13
2	89	119	1.34
3	100	120	1.20
4	83	114	1.37
5	56	76	1.36
6	81	89	1.10
7	62	74	1.19
8	66	73	1.11
9	76	74	0.97
10	60	65	1.08
11	77	65	0.84
12	124	100	0.81
13	67	53	0.79
14	76	56	0.74
15	89	57	0.64
16	117	58	0.50
17	119	69	0.58
18	113	50	0.44
19	30	16	0.53
20	40	11	0.28
21	43	9	0.21
22	35	12	0.34
23	83	14	0.17
24	54	7	0.13
25	30	5	0.17
26	30	3	0.10
27	20	4	0.20
28	23	4	0.17
29	22	0	0.00
30	32	2	0.06
31	20	0	0.00
32	28	6	0.21
33	21	3	0.14
34	7	2	0.29
35	19	9	0.47
36	17	1	0.06
37	15	0	0.00
38	7	0	0.00
39+	88	14	0.16
Total	2,309	1,647	0.71⁴

⁴ Some students could not be matched to a unique address, leading to the slightly different average student yield as compared to Table 18.

Figure 25 shows that, in general, student yields slowly increase with length of ownership, peaking at 1.37 children per housing unit with four (4) years of ownership. Student yields then decline as length of ownership increases. Student yields are typically below 0.20 children per home after 20 years of ownership. While there are a few exceptions, it is due to the small number of homes at long lengths of ownership, where adding just a few students can greatly influence the student yield.

Figure 25
Student Yields by Length of Ownership
Detached Single-Family Homes
Plainsboro Township



As discussed previously, the average student yield (0.71) computed from the entire housing stock likely underestimates the actual student yield when a family either moves into a new home or a resale. If an average student yield is computed for the first four years of ownership when the peak student yield occurs, the yield increases to 1.23. This is likely a better estimate of the student yield of detached single-family homes in Plainsboro. Student yields for detached single-family homes are slightly higher in Plainsboro as compared to West Windsor (1.13).

Student Yield Analysis for Townhouses and Condominiums

Student yields were also computed for townhouses and condominiums in Plainsboro by joining the township's parcel-level database with student addresses from the 2016-17 year. Lengths of ownership were not computed as there is a lot of variation of the student yields based on the development's bedroom distribution and whether it has child-friendly amenities, such as a playground or swimming pool. Student yields by housing development for townhouses and condominiums in 2016-17 are shown in Table 20 and compared to the student yields in 2011-12 as previously shown in the January 2013 demographic study. A total of 2,090 units were identified in eight (8) separate developments. Student yields were largest in Brittany (0.87) and Hampshire (0.84). The overall student yield for townhouses and condominiums was 0.56, which is slightly higher than 2011-12 (0.50).

Table 20
Plainsboro Student Yields for Condominiums and Townhouses

Development	Year Built	Bedrooms	Number of Units	Number of Students¹	2011-12 Student Yield	2016-17 Student Yield
Ashford	1990-1994	3	107	83	0.76	0.78
Aspen	1985	1-2	352	169	0.39	0.48
Brittany	1986	2-3	274	239	0.93	0.87
Hampshire	1987	2-3	306	258	0.79	0.84
Pond View/ Water's Edge	1981	2	32	20	0.47	0.63
The Villages at Princeton Crossing	1994	1-3	136	79	0.57	0.58
Princeton Landing³	Mid-1980s	2-3	599	200	0.23	0.33
Tamarron³	1986	2-3	284	132	0.36	0.46
Total			2,090	1,180	0.50²	0.56

Notes: ¹Based on 2016-17 enrollment

²Barclay Square was no longer categorized as townhouses. Instead, it is categorized as apartments in this study, which changed the overall yield from the 2011-12 report.

³Contains a mix of market-rate and affordable units

Student Yield Analysis for Apartments

In addition, student yields were computed for apartment complexes in Plainsboro. Student yields by housing development for apartments in 2016-17 are shown in Table 21 and compared to the student yields in 2011-12 as previously shown in the January 2013 demographic study. The table is not an all-inclusive list of all apartment units, as it only includes large apartment complexes. A total of 5,094 units were identified in eight (8) separate developments. Student yields were largest in Wyndhurst (0.52), which contains a mix of market-rate and affordable units. The overall student yield for apartment units in 2016-17 was 0.25, which is nearly unchanged from 2011-12.

Table 21
Plainsboro Student Yields for Apartments

Development	Year Built	Bedrooms	Number of Units	Number of Students¹	2011-12 Student Yield	2016-17 Student Yield
Barclay Square	2005	2-3	220	33	0.31	0.19
Deer Creek	1976	1-2	288	76	0.27	0.26
The Crossing at Plainsboro (Fox Run)	1978	1-2	776	156	0.18	0.20
Hunters Glen	1976	1-2	896	184	0.19	0.21
Addison at Princeton Meadows (Pheasant Hollow)	1981	1-2	440	126	0.29	0.29
Quail Ridge	N/A	0-2	1,032	259	0.23	0.25
Ravens Crest	1984	1-2	1,316	344	0.26	0.26
Wyndhurst³	1994	1-3 BR	126	65	0.50	0.52
Total			5,094	1,243	0.24²	0.25

Notes: ¹Based on 2016-17 enrollment

²Barclay Square was no longer categorized as townhouses. Instead, it is categorized as apartments in this study, which changed the overall yield from the 2011-12 report.

³Contains a mix of market-rate and affordable units

Estimate of Public School Children from New Housing

An estimate was made of the number of public school children that could potentially come from the proposed housing developments in each community. It was assumed that all the developments listed in Tables 12 and 17 will be constructed and occupied during the enrollment projection timeframe. In addition, several other assumptions were made:

1. All affordable and market-rate apartments in Woodstone at Princeton would be occupied over a three-year period (2020-2022) and would have the township's average student yield multiplier for apartments: 0.58⁵.
2. All affordable and market-rate apartments in the Toll Brothers-Maneely Property would be occupied over a two-year period (2018-2019) and would have the township's average student yield multiplier for apartments: 0.58⁶.
3. All affordable and market-rate apartments in Princeton Ascend would be occupied in 2019 and would have the township's average student yield multiplier for apartments: 0.58⁷.
4. All townhouses in Princeton Ascend would be occupied in 2019 and were assumed to have the student yield multiplier as computed for Estates at Princeton Junction (based on newer construction and bedroom size): 0.85.
5. All townhouses in the Toll Brothers-Maneely Property would be occupied over a two-year period (2018-2019) and were assumed to have the student yield multiplier as computed for Estates at Princeton Junction (based on newer construction and bedroom size): 0.85.
6. All market-rate apartments in Ellsworth Center would be occupied in 2019 and were assumed to have the student yield multiplier as computed for Princeton Theological Seminary (comparable bedroom size): 0.17.
7. All detached single-family homes in Cherry Grove and Bear Brook Homes would be occupied in 2019 and were assumed to have the following student yield multiplier: 1.13⁸.
8. All detached single-family homes in Princeton Glen would be occupied in 2018 and were assumed to have the following student yield multiplier: 1.23⁹.

⁵ As the units at Princeton Theological Seminary are not a mix of market-rate and affordable units, they were removed in the student yield calculation.

⁶ Ibid.

⁷ Ibid.

⁸ As derived from the West Windsor current length of ownership for detached single-family homes

⁹ As derived from the Plainsboro current length of ownership for detached single-family homes

9. All market-rate apartments in Princeton Forrestal Village would be occupied over a three-year period (2020-2022) and would have the township's average student yield multiplier for apartments: 0.24¹⁰.
10. All affordable apartments in Princeton Forrestal Village would be occupied over a three-year period (2020-2022) and were assumed to have the student yield multiplier as computed for Wyndhurst: 0.52.
11. All affordable apartments in Place at Plainsboro would be occupied over a two-year period (2019-2020) and were assumed to have the student yield multiplier as computed for Wyndhurst: 0.52.

Based on these student yields, a total of 566 public school children in grades K-12 are projected according to the following distribution:

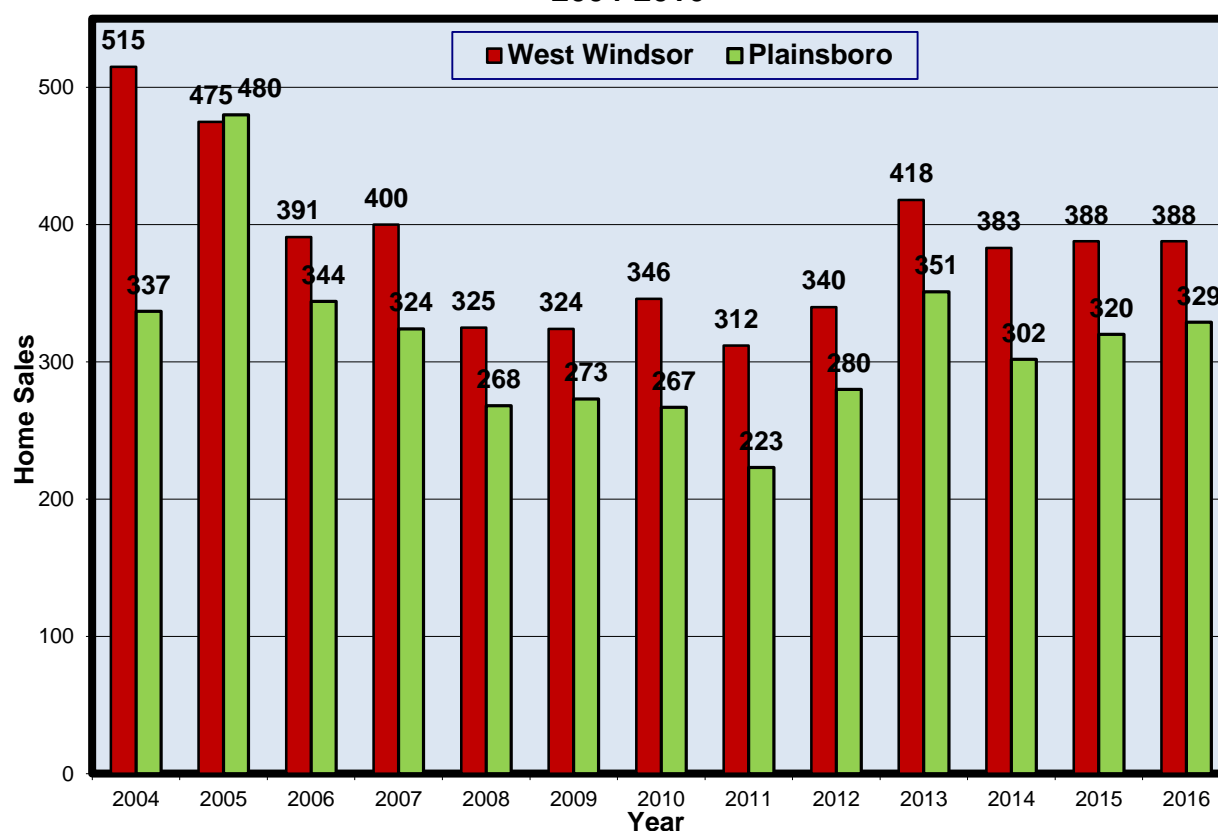
- Woodstone at Princeton (W. Windsor) – 257
- Toll Brothers Maneely Property (W. Windsor) – 108
- Ellsworth Center (W. Windsor) – 3
- Princeton Ascend (W. Windsor) – 16
- Cherry Grove (W. Windsor) – 7
- Bear Brook Homes (W. Windsor) – 9
- Place at Plainsboro (Plainsboro) – 52
- Princeton Forrestal Village (Plainsboro) – 109
- Princeton Glen Homes (Plainsboro) – 5

¹⁰ As Wyndhurst consists of a mix of market-rate and affordable units, they were removed in the student yield calculation.

Home Sales

In Figure 26 below, the number of annual home sales in West Windsor and Plainsboro is shown from 2004-2016. The information was again derived from the Monmouth County Tax Board database, which possesses tax records and home sales for all municipalities in the state. Paper sales were excluded from the totals below. In West Windsor, after having 515 home sales in 2004, the number of sales declined to 312 in 2011 due to the housing market crash and banking crisis. Since then, home sales have rebounded and have ranged from 383-388 in the last three years, yet are far below the peak number of sales that occurred in 2004. In Plainsboro, after peaking at 480 home sales in 2005, the number of sales declined to 223 in 2011. Since then, home sales have slowly increased and have ranged from 302-351 in the last four years, yet are far below the peak number of sales that occurred in 2005.

Figure 26
West Windsor and Plainsboro Home Sales
2004-2016



Historical Residential Construction

With respect to historical new construction in West Windsor, the number of certificates of occupancy (“COs”) issued for new homes has dropped significantly in the last few years as shown in Table 22. While 255 COs were issued in 2013, only 95 housing units have been built in the last four years. From 2012-2017, a total of 423 COs were issued; only 18 were issued for single-family or two-family homes while 405 were issued for multi-family homes. Most of the COs for multi-family homes was likely related to the construction of Princeton Terrace, which consists of 465 apartment units. In Plainsboro, new construction has been limited, as only 24 COs were issued from 2012-2017. Almost all of the COs were issued for single-family or two-family homes.

Table 22
Number of Residential Certificates of Occupancy by Year

	West Windsor Township			Plainsboro Township		
Year	1&2 Family	Multi-Family	Total	1&2 Family	Multi-Family	Total
2012	8	65	73	7	0	7
2013	5	250	255	7	0	7
2014	0	50	50	4	1	5
2015	2	40	42	5	0	5
2016	3	0	3	0	0	0
2017 (thru October)	0	0	0	0	0	0
Total	18	405	423	23	1	24

Source: New Jersey Department of Community Affairs

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. Therefore, it is not appropriate to add all of the new children generated from new housing units without considering the historical period, as double counting would occur. Instead, the estimated number of public school children generated from new housing over the historical period (2012-2017) needs to be subtracted from the estimated number of children from future new housing. The net number of children is then added into the baseline enrollment projections.

In the forthcoming section, the baseline enrollment projections were adjusted for the additional children anticipated from the new housing developments. As described above, assumptions were made regarding the timeline of unit occupation and the distribution of children per grade level.

Enrollment Projections

Enrollments were projected at the school level using cohort-survival ratios based on the last five years of historical enrollment data. Enrollments were computed for each grade from 2018-19 through 2022-23, a five-year period. The projections were completed for a five-year period rather than ten years as a five-year projection is much more reliable. Since birth data are used to project kindergarten students five years later, the ten-year projection in years 6-10 relies on estimated birth counts in order to project the number of kindergarten students. For this reason, elementary projections are much more susceptible to higher error rates in a ten-year projection as compared to middle or high school projections, which rely on either children that have already been born or that are currently enrolled in the district. In addition, it should be noted that the future projections do not take into account the additional 1,500 affordable housing units that West Windsor will be required to build by 2025. Due to the uncertainty of how the township will specifically meet its obligation and the timeline to do so, and the difficulty in reliably projecting future births in small municipalities such as Plainsboro and West Windsor, this report does not project enrollments beyond five years.

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

With respect to grade-level pre-kindergarten students in Village and Town Center, enrollment was projected by computing an average based on historical data and using this value throughout the five-year projection period.

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

As part of the School Funding Reform Act of 2008 (“SFRA”), all school districts in New Jersey are to provide expanded Abbott-quality pre-school programs for at-risk 3- and 4-year olds as outlined in N.J.A.C. 6A:13A. The State of New Jersey intends to provide aid for the full-day program based on projected enrollment. School districts categorized as District Factor Group¹¹ (“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.

¹¹ 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.

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

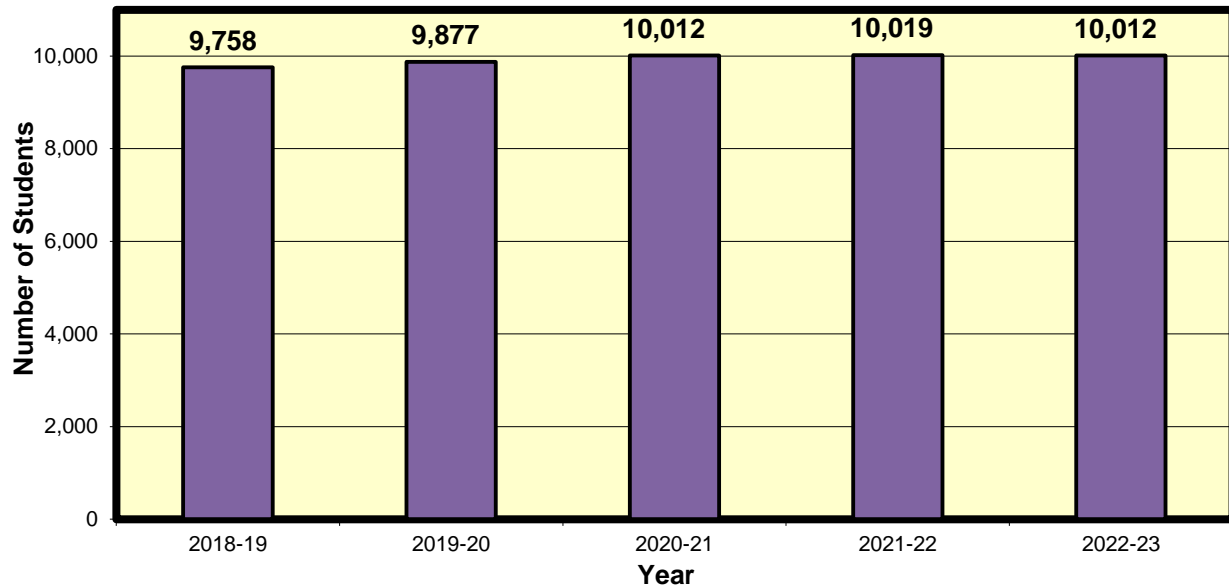
The universe of pre-school children in “Universal” districts is computed by multiplying the 1st grade enrollment in 2007-08 by two. The universe of pre-school children in “Targeted” districts is computed by multiplying the 1st grade enrollment in 2007-08 by two and then multiplying by the percentage of students (K-12) having free or reduced lunch in the district. West Windsor-Plainsboro is a “Targeted” district since its DFG is “J” with a concentration of at-risk pupils less than 40 percent (3.52%). In Table 23 following, the estimated number of total eligible pre-school students is provided with the estimated five-year rollout. As the table shows, there is the potential for 44 pre-kindergarten students as a result of the SFRA. Since it is unclear if and when the program will be funded and subsequently mandated, the forthcoming enrollment projections do not include additional pre-kindergarten students from the SFRA. For the purpose of this study, it has been assumed that the district would educate its pre-school children in-house. If the pre-school program were ever mandated, it does not appear the impact on the school district’s enrollment would be significant.

Table 23
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	44	9	15	22	29	40

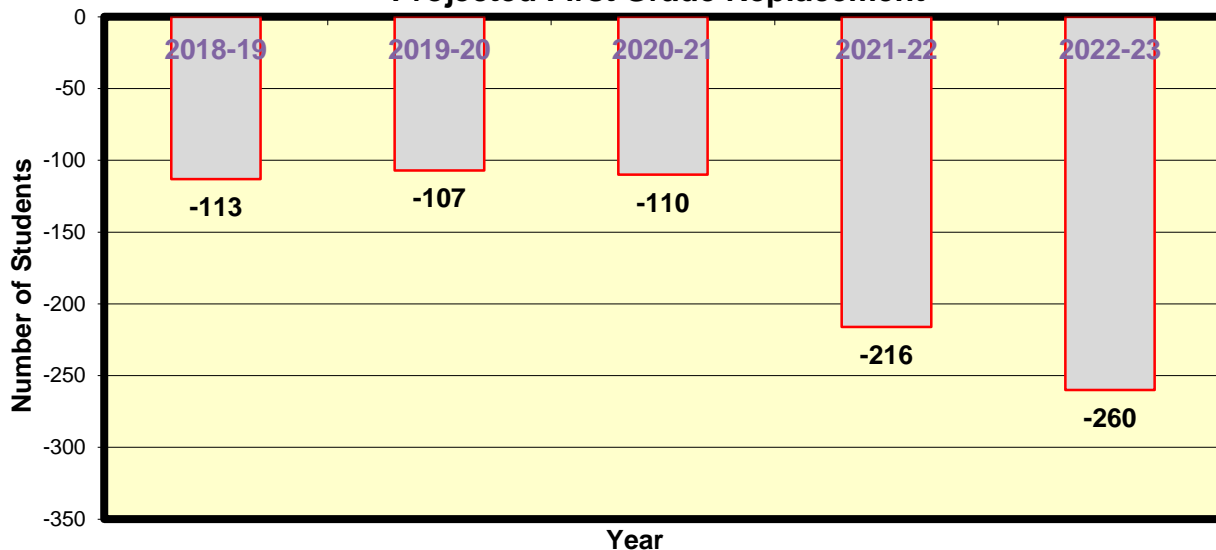
Source: New Jersey Department of Education, Division of Early Childhood Education

Figure 27
West Windsor-Plainsboro Regional School District
Enrollment Projections
2018-19 to 2022-23



As shown in Figure 28, negative first grade replacement is projected for the next five years. The magnitude of the negative first grade replacement is projected to increase by the end of the projection period, peaking at 260 students in 2022-23, which is much greater than the negative first grade replacement that occurred in 2017-18 (-152.5).

Figure 28
West Windsor-Plainsboro Regional School District
Projected First Grade Replacement



Projected Enrollments by Grade Configuration

In Table 25 following, historical and projected enrollments are displayed by elementary, middle, and high school grade configurations (PK-5, 6-8, and 9-12) in West Windsor-Plainsboro Regional. It should be noted that the enrollments of the PK-2, PK-3, 3-5, and 4-5 schools were grouped together for reporting purposes. At the elementary level containing grades PK-5, enrollment is projected to decline, in general, throughout the projection period. In 2022-23, enrollment is projected to be 4,080, which would represent a loss of 141 students from the 2017-18 enrollment of 4,221.

For grades 6-8, enrollment is projected to increase through 2021-22 before reversing trend. Enrollment is projected to be 2,591 in 2022-23, which would represent a gain of 155 students from the 2017-18 enrollment of 2,436.

For grades 9-12, enrollment is projected to increase throughout the projection period. In 2022-23, enrollment is projected to be 3,341, which would be a gain of 320 students from the 2017-18 enrollment of 3,021.

Table 25
West Windsor-Plainsboro Regional School District Projected Enrollments
Grades PK-5, 6-8, and 9-12

Historical	PK-5	6-8	9-12
2017-18	4,221	2,436	3,021
Projected	PK-5	6-8	9-12
2018-19	4,190	2,464	3,104
2019-20	4,212	2,479	3,186
2020-21	4,158	2,579	3,275
2021-22	4,078	2,604	3,337
2022-23	4,080	2,591	3,341
5-year Change	-141	+155	+320

Projections by School

Dutch Neck Elementary School

Historical enrollments for Dutch Neck Elementary School (“Dutch Neck”) from 2012-13 to 2017-18, and projected enrollments from 2018-19 to 2022-23, are shown below in Table 26. Enrollment has been fairly stable, ranging from 668-702 students in the last six years. Enrollment is 687 in 2017-18. Since there are no housing units planned in the Dutch Neck attendance area, the baseline projections were not adjusted. Enrollment is projected to decline throughout the projection period. In 2022-23, enrollment is projected to be 540, which would be a loss of 147 students from the 2017-18 enrollment.

Table 26
Historical and Projected Enrollments of Dutch Neck Elementary School

Year	PK	K	1	2	3	SE ²	PK-3 Total
Historical¹							
2012-13	0	133	171	185	195	18	702
2013-14	1	120	156	183	188	20	668
2014-15	0	145	159	160	191	17	672
2015-16	0	130	184	195	183	0	692
2016-17	0	111	171	204	215	1	702
2017-18	0	160	140	169	218	0	687
CSR 5-Yr. Ratios		2.0803 ³	1.2927	1.0873	1.0897	0.0005 ⁴	
Projected							
2018-19	0	119	207	152	184	0	662
2019-20	0	96	154	225	166	0	641
2020-21	0	116	124	167	245	0	652
2021-22	0	96	150	135	182	0	563
2022-23	0	106	124	163	147	0	540
5-Year Change							-147

Notes: ¹Data as provided by the New Jersey Department of Education (<http://www.nj.gov/education/data/enr/>) and the West Windsor-Plainsboro Regional School District

²Self-contained special education enrollment/Ungraded Students

³Birth-to-kindergarten survival ratio based on birth data five years prior using four years of historical data

⁴Average proportion of self-contained special education/Ungraded students with respect to PK-3 subtotals based on last three years of historical data

Maurice Hawk Elementary School

Historical enrollments for Maurice Hawk Elementary School (“Maurice Hawk”) from 2012-13 to 2017-18, and projected enrollments from 2018-19 to 2022-23, are shown below in Table 27. Prior to 2017-18, enrollment had been decreasing in the school. In 2017-18, enrollment is 749, which is a loss of 133 students from the 2012-13 enrollment of 882. Enrollments, adjusted for housing growth, are projected to slowly decline throughout the projection period. In 2022-23, enrollment is projected to be 717, which would be a decline of 32 students from the 2017-18 enrollment.

Table 27
Historical and Projected Enrollments of Maurice Hawk Elementary School

Year	PK	K	1	2	3	SE ²	PK-3 Total
Historical¹							
2012-13	0	204	188	237	239	14	882
2013-14	0	150	226	192	238	12.5	818.5
2014-15	0	166	165	240	203	16	790
2015-16	0	180	189	165	256	0	790
2016-17	0	156	187	207	160	17	727
2017-18	0	131	179	209	216	14	749
CSR 5-Yr. Ratios		0.8871 ³	1.1062	1.0687	1.0343	0.0215 ⁴	
Projected							
2018-19	0	166	151	196	222	15	750
2019-20	0	153	191	169	211	15	739
2020-21	0	130	177	212	183	14	716
2021-22	0	148	152	197	228	14	739
2022-23	0	150	172	170	212	13	717
5-Year Change							-32

Notes: ¹Data as provided by the New Jersey Department of Education (<http://www.nj.gov/education/data/enr/>) and the West Windsor-Plainsboro Regional School District

²Self-contained special education enrollment/Ungraded Students

³Birth-to-kindergarten survival ratio based on birth data five years prior with outlier removed

⁴Average proportion of self-contained special education/Ungraded students with respect to PK-3 subtotals based on last two years of historical data

Town Center Elementary School

Historical enrollments for Town Center Elementary School (“Town Center”) from 2012-13 to 2017-18, and projected enrollments from 2018-19 to 2022-23, are shown below in Table 28. In 2015-16, Town Center changed from a PK-3 to a PK-2 grade configuration. Since the change, enrollment has been declining. In 2017-18, enrollment is 522 students, which is a loss of 61 students from the 2015-16 enrollment of 583. Since there are no housing units planned in the Town Center attendance area, the baseline projections were not adjusted. Enrollment is projected to decline near the end of the projection period. In 2022-23, enrollment is projected to be 492, which would be a loss of 30 students from the 2017-18 enrollment

Table 28
Historical and Projected Enrollments of Town Center Elementary School

Year	PK	K	1	2	3	SE ²	PK-3 Total
Historical¹							
2012-13	15	168	155	175	165	49	727
2013-14	14	170	194	165	176	45	764
2014-15	0	143	187	199	167	36	732
2015-16	32	156	191	204	0	0	583
2016-17	1	143	174	196	0	62	576
2017-18	5	140	152	184	0	41	522
CSR 5-Yr. Ratios		0.8743 ³	1.1535	1.0501	N/A	0.1029 ⁴	
Projected							
2018-19	5	132	161	160		47	505
2019-20	5	155	152	169		50	531
2020-21	5	133	179	160		49	526
2021-22	5	125	153	188		48	519
2022-23	5	136	144	161		46	492
5-Year Change							-30

Notes: ¹Data as provided by the New Jersey Department of Education (<http://www.nj.gov/education/data/enr/>) and the West Windsor-Plainsboro Regional School District

²Self-contained special education enrollment/Ungraded Students

³Birth-to-kindergarten survival ratio based on birth data five years prior with outlier removed

⁴Average proportion of self-contained special education/Ungraded students with respect to PK-2 subtotals based on last two years of historical data

J.V.B. Wicoff Elementary School

Historical enrollments for J.V.B. Wicoff Elementary School (“Wicoff”) from 2012-13 to 2017-18, and projected enrollments from 2018-19 to 2022-23, are shown below in Table 29. After peaking at 481 students in 2013-14, enrollment has been slowly declining in Wicoff. In 2017-18, enrollment is 449, which is similar to the 2012-13 enrollment of 452. Enrollments, adjusted for housing growth, are projected to slowly increase throughout the projection period. In 2022-23, enrollment is projected to be 501, which would be a gain of 52 students from the 2017-18 enrollment.

Table 29
Historical and Projected Enrollments of J.V.B Wicoff Elementary School

Year	PK	K	1	2	3	SE ²	PK-3 Total
Historical¹							
2012-13	16	90	101	112	107	26	452
2013-14	21	108	109	108	113	22	481
2014-15	13	84	115	109	110	31	462
2015-16	0	122	105	112	110	0	449
2016-17	0	99	129	109	110	11	458
2017-18	0	93	111	130	104	11	449
CSR 5-Yr. Ratios		0.9667 ³	1.1234	1.0049	0.9910	0.0249 ⁴	
Projected							
2018-19	0	108	105	112	129	11	465
2019-20	0	107	123	109	113	11	463
2020-21	0	108	126	130	114	11	489
2021-22	0	105	124	131	132	11	503
2022-23	0	108	120	129	133	11	501
5-Year Change							+52

Notes: ¹Data as provided by the New Jersey Department of Education (<http://www.nj.gov/education/data/enr/>) and the West Windsor-Plainsboro Regional School District

²Self-contained special education enrollment/Ungraded Students

³Birth-to-kindergarten survival ratio based on birth data five years prior using three years of historical data

⁴Average proportion of self-contained special education/Ungraded students with respect to PK-3 subtotals based on last two years of historical data

Millstone River School

Historical enrollments for the Millstone River School (“Millstone River”) from 2012-13 to 2017-18, and projected enrollments from 2018-19 to 2022-23, are shown below in Table 30. In 2015-16, Millstone River changed from a grade 4-5 to a grade 3-5 grade school. Since the change, enrollment has been fairly stable, ranging from 1,035 to 1,088 students per year. Enrollments, adjusted for housing growth, are projected to be fairly stable for the next three years before declining near the end of the projection period. In 2022-23, enrollment is projected to be 1,049, which would be a loss of 39 students from the 2017-18 enrollment of 1,088.

Table 30
Historical and Projected Enrollments of the Millstone River School

Year	PK	3	4	5	SE ²	PK, 3-5 Total
Historical¹						
2012-13	0	0	412	391	47	850
2013-14	4	0	387	405	43	839
2014-15	0	0	424	397	54	875
2015-16	0	214	385	452	0	1,051
2016-17	0	205	428	387	15	1,035
2017-18	0	208	415	445	20	1,088
CSR 5-Yr. Ratios		1.0472 ³	2.0122	1.0342	0.0142 ⁴	
Projected						
2018-19	0	194	413	429	15	1,051
2019-20	0	171	454	430	15	1,070
2020-21	0	182	406	473	14	1,075
2021-22	0	171	396	422	13	1,002
2022-23	0	200	424	411	14	1,049
5-Year Change						-39

Notes: ¹Data as provided by the New Jersey Department of Education (<http://www.nj.gov/education/data/enr/>) and the West Windsor-Plainsboro Regional School District

²Self-contained special education enrollment/Ungraded Students

³Grade 2-3 ratio computed using grade 2 enrollments from Town Center.

⁴Average proportion of self-contained special education/Ungraded students with respect to 3-5 subtotals based on last two years of historical data

Village School

Historical enrollments for the Village School from 2012-13 to 2017-18, and projected enrollments from 2018-19 to 2022-23, are shown below in Table 31. Since instituting a pre-kindergarten program in the school in 2015-16, enrollment has been fairly stable. Enrollment is 726 in 2017-18. With the exception of 2020-21, enrollments, adjusted for housing growth, are projected to be higher in the next five years. In 2022-23, enrollment is projected to be 781, which would be a gain of 55 students from the 2017-18 enrollment.

Table 31
Historical and Projected Enrollments of the Village School

Year	PK	4	5	SE ²	PK, 4-5 Total
Historical¹					
2012-13	0	325	297	17	639
2013-14	15	365	335	17	732
2014-15	0	317	370	27	714
2015-16	46	327	340	0	713
2016-17	42	345	346	8	741
2017-18	51	312	347	16	726
CSR 5-Yr. Ratios		1.0410 ³	1.0375	0.0130 ⁴	
Projected					
2018-19	46	372	329	10	757
2019-20	46	319	393	10	768
2020-21	46	306	339	9	700
2021-22	46	372	325	9	752
2022-23	46	333	393	9	781
5-Year Change					+55

Notes: ¹Data as provided by the New Jersey Department of Education (<http://www.nj.gov/education/data/enr/>) and the West Windsor-Plainsboro Regional School District

²Self-contained special education enrollment/Ungraded Students

³Districtwide grade 3-4 ratio

⁴Average proportion of self-contained special education/Ungraded students with respect to 4-5 subtotals based on last two years of historical data

Community Middle School

Historical enrollments for Community Middle School (“Community”) from 2012-13 to 2017-18, and projected enrollments from 2018-19 to 2022-23, are shown below in Table 32. Since 2013-14, enrollment has been generally increasing. In 2017-18, enrollment is 1,172, which is a gain of 56 students from the 2012-13 enrollment of 1,116. Enrollments, adjusted for housing growth, are projected to increase throughout the projection period. In 2022-23, enrollment is projected to be 1,347, which would be a gain of 175 students from the 2017-18 enrollment.

Table 32
Historical and Projected Enrollments of Community Middle School

Year	6	7	8	SE ²	6-8 Total
Historical¹					
2012-13	360	350	352	54	1,116
2013-14	345	357	356	36	1,094
2014-15	386	352	347	51	1,136
2015-16	383	407	362	0	1,152
2016-17	393	372	397	18	1,180
2017-18	373	398	390	11	1,172
CSR 5-Yr. Ratios	1.0399 ³	1.0147	1.0061	0.0125 ⁴	
Projected					
2018-19	428	378	400	15	1,221
2019-20	442	435	382	16	1,275
2020-21	424	452	442	16	1,334
2021-22	477	432	458	16	1,383
2022-23	407	487	437	16	1,347
5-Year Change					+175

Notes: ¹Data as provided by the New Jersey Department of Education (<http://www.nj.gov/education/data/enr/>) and the West Windsor-Plainsboro Regional School District

²Self-contained special education enrollment/Ungraded Students

³Districtwide grade 5-6 ratio

⁴Average proportion of self-contained special education/Ungraded students with respect to 6-8 subtotals based on last two years of historical data

Grover Middle School

Historical enrollments for Grover Middle School (“Grover”) from 2012-13 to 2017-18, and projected enrollments from 2018-19 to 2022-23, are shown below in Table 33. Historical enrollments have been trending higher in the last four years. In 2017-18, enrollment is 1,264, which is a gain of 86 students from the 2012-13 enrollment of 1,178. Enrollments, adjusted for housing growth, are projected to be fairly stable in the next five years, ranging from 1,204-1,245 students per year. In 2022-23, enrollment is projected to be 1,244, which would be slightly lower than the 2017-18 enrollment.

Table 33
Historical and Projected Enrollments of Grover Middle School

Year	6	7	8	SE ²	6-8 Total
Historical¹					
2012-13	396	384	398	0	1,178
2013-14	353	409	393	0	1,155
2014-15	387	367	406	1	1,161
2015-16	412	402	374	0	1,188
2016-17	417	431	416	0	1,264
2017-18	401	414	448	1	1,264
CSR 5-Yr. Ratios	1.0399 ³	1.0293	1.0215	0.0003 ⁴	
Projected					
2018-19	400	417	426	0	1,243
2019-20	355	417	432	0	1,204
2020-21	442	371	432	0	1,245
2021-22	375	461	385	0	1,221
2022-23	377	391	476	0	1,244
5-Year Change					-20

Notes: ¹Data as provided by the New Jersey Department of Education (<http://www.nj.gov/education/data/enr/>) and the West Windsor-Plainsboro Regional School District

²Self-contained special education enrollment/Ungraded Students

³Districtwide grade 5-6 ratio

⁴Average proportion of self-contained special education/Ungraded students with respect to 6-8 subtotals

West Windsor-Plainsboro High School North

Historical enrollments for West Windsor-Plainsboro High School North from 2012-13 to 2017-18, and projected enrollments from 2018-19 to 2022-23, are shown below in Table 34. Prior to 2017-18, enrollment had been declining in the school. In 2017-18, enrollment is 1,431, which is a loss of 178.5 students from the 2012-13 enrollment of 1,609.5. Enrollments, adjusted for housing growth, are projected to steadily increase throughout the projection period. In 2022-23, enrollment is projected to be 1,641, which would be a gain of 210 students from the 2017-18 enrollment.

Table 34
Historical and Projected Enrollments of
West Windsor-Plainsboro High School North

Year	9	10	11	12	SE ²	9-12 Total
Historical¹						
2012-13	384	413.5	385.5	379.5	47	1,609.5
2013-14	340	377	399	383	48.5	1,547.5
2014-15	335	334.5	373	384	58	1,484.5
2015-16	347	343.5	337.5	366.5	7	1,401.5
2016-17	342	326	339	328	44.5	1,379.5
2017-18	385	344	333	345	24	1,431
CSR 5-Yr. Ratios	0.9573 ³	0.9727	1.0042	0.9948	0.0252 ⁴	
Projected						
2018-19	374	374	345	331	36	1,460
2019-20	385	365	377	344	37	1,508
2020-21	369	378	370	378	37	1,532
2021-22	425	361	382	369	38	1,575
2022-23	441	416	364	381	39	1,641
5-Year Change						+210

Notes: ¹Data as provided by the New Jersey Department of Education (<http://www.nj.gov/education/data/enr/>) and the West Windsor-Plainsboro Regional School District

²Self-contained special education enrollment/Ungraded Students

³Grade 8-9 ratio using grade 8 enrollments from Community Middle School

⁴Average proportion of self-contained special education/Ungraded students with respect to 9-12 subtotals based on last two years of historical data

West Windsor-Plainsboro High School South

Historical enrollments for West Windsor-Plainsboro High School South from 2012-13 to 2017-18, and projected enrollments from 2018-19 to 2022-23, are shown below in Table 35. Enrollment has been very stable in the school, ranging from 1,588-1,608.5 students per year. In 2017-18, enrollment is 1,590. Enrollments, adjusted for housing growth, are projected to steadily increase through 2021-22 before reversing trend. In 2022-23, enrollment is projected to be 1,700, which would be a gain of 110 students from the 2017-18 enrollment.

Table 35
Historical and Projected Enrollments of
West Windsor-Plainsboro High School South

Year	9	10	11	12	SE ²	9-12 Total
Historical¹						
2012-13	370	430	397.5	401.5	0	1,599
2013-14	411	371	430	395.5	1	1,608.5
2014-15	397	407	366	429.5	0	1,599.5
2015-16	413	402	412.5	360.5	0	1,588
2016-17	372	409	404.5	406.5	0	1,592
2017-18	417	377	403	392	1	1,590
CSR 5-Yr. Ratios	0.9985 ³	1.0019	0.9958	0.9773	0.0003 ⁴	
Projected						
2018-19	450	420	378	396	0	1,644
2019-20	429	455	422	372	0	1,678
2020-21	435	434	457	417	0	1,743
2021-22	435	440	436	451	0	1,762
2022-23	388	440	442	430	0	1,700
5-Year Change						+110

Notes: ¹Data as provided by the New Jersey Department of Education (<http://www.nj.gov/education/data/enr/>) and the West Windsor-Plainsboro Regional School District

²Self-contained special education enrollment/Ungraded Students

³Grade 8-9 ratio using grade 8 enrollments from Grover Middle School

⁴Average proportion of self-contained special education/Ungraded students with respect to 9-12 subtotals

Housing Turnover Analysis

In a completely independent analysis, historical housing turnover rates by length of ownership in West Windsor and Plainsboro were used along with current student yields by length of ownership to project the number of students from 2017-2021, a five-year period. To accomplish this task, 8,030 housing units in West Windsor and 5,491 housing units in Plainsboro designated as Class 2 properties (1- to 4-family homes) were analyzed. Mixed-use properties (commercial and residential combined) and farms were excluded. In addition, apartments were also excluded since the length of time a tenant occupies a residence cannot be determined. Since West Windsor and Plainsboro each have their own unique housing market, this analysis was performed separately for each community. To complete this analysis, three inputs were needed:

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

1. West Windsor Township

Turnover Rates

To compute turnover rates, parcel-level data 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 1978, providing 38 years of historical sale data through 2016. However, data were limited prior to 1985 as there were very few sales recorded.

Each cohort of homes was followed to see when it was sold next to compute the housing turnover rate by length of ownership. As an example, we will assume a house was built in 1972 and its three most recent sale dates in the database were 1992, 1995, and 1999. We cannot assume that the first length of ownership is 20 years since the house may have been sold prior to 1978, the earliest year sales were recorded. The first length of ownership is three years (1992 to 1995) whereby the home then becomes part of the 1995 cohort. After being sold four years later in 1999, the house becomes part of the 1999 cohort. Each time a home is sold, it becomes part of a different cohort of homes. In this example, the house was in three separate cohorts. Turnover rates were then computed by dividing the number of homes sold at a particular length of ownership by the total number of homes in the cohort. For instance, in West Windsor's 2000 cohort, 61 homes sold in the first year of ownership out of 721 homes, resulting in a turnover rate of 8.5%. An additional 48 homes were sold in the second year of ownership, resulting in a turnover rate of 6.7%. Turnover rates by length of ownership were computed and capped at 16 years for this cohort, since 2016 is the most recent year that sales data were available. Since the oldest sales were from 1978, computing turnover rates was possible on long-held homes, with lengths of ownership up to 38 years.

In short, for each year from 1978-2016, there is a distribution of turnover rates by length of ownership. Length of ownership data was not collected for homes built or sold in 2017 as the data

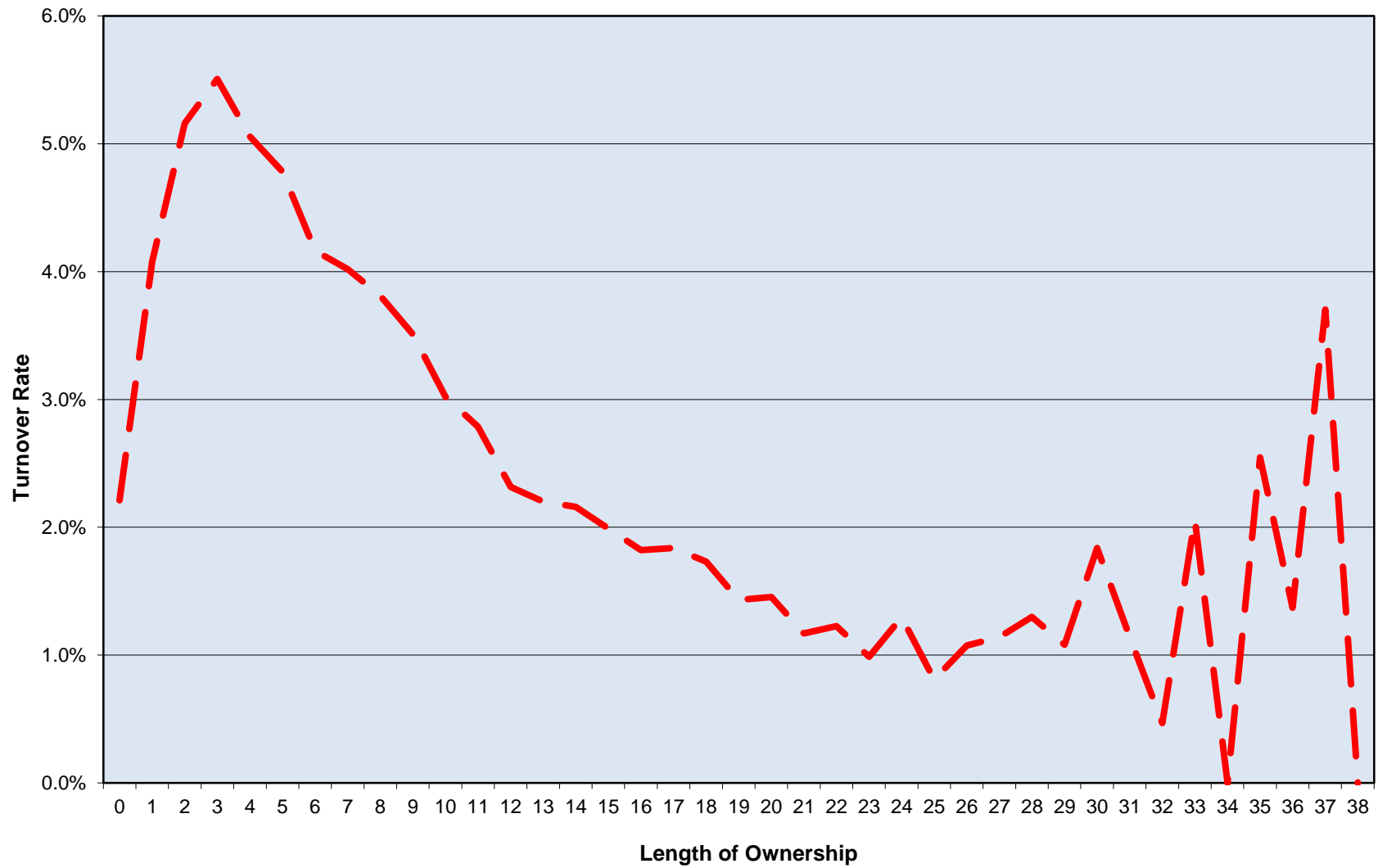
were incomplete. Obviously, there is not much information for homes with recent sale dates, such as 2013, since these homes may not have been sold again or would only have turnover rates by length of ownership of up to three years. At the other end of the spectrum, there were not many home sales in the 1970s and early 1980s since there were fewer homes in West Windsor and homeowners tended to stay in their homes longer and not “move up” to a bigger home.

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 2000s, the turnover rate for the first year of ownership in West Windsor was approximately 8-9%, 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 was approximately 1-3%, which is a significantly lower rate, as homeowners had difficulty selling their homes.

Figure 29 shows the distribution of turnover rates by length of ownership in West Windsor from 1985-2000 using a 3-year moving average to smooth out unusual year-to-year variations in the turnover rates. Although data were collected from 1978-2016, turnover rates for homes sold before 1985 are not shown as sales data were limited. In addition, home sales after 2000 are not shown, as they would only have maximum lengths of ownership of 16 years or less. While there is still a lot of variation even after using the three-year moving average, the figure shows that turnover rates decrease as lengths of ownership increase.

In Figure 30 following, weighted-average turnover rates by length of ownership are shown, which combines length of ownership data from all of the historical years. This data takes into account all housing market cycles, both when the housing market was very strong, such as the early to mid-2000s, and when it was weak, such as the period after the banking and financial crises of 2008. As the figure shows, turnover rates are greatest in West Windsor at three years of ownership before declining as turnover rates are lowest for longer lengths of ownership. For homes with 20 or more years of ownership, turnover rates were typically less than 1.5%. While there appears to be several spikes in the turnover rate after 30 years of ownership, this is misleading since there were very few homes at these lengths of ownership and a few sales had a large impact on the turnover rate.

Figure 30
Historical Weighted-Average Turnover Rates by Length of Ownership
West Windsor Township



Current Distribution of Homes by Length of Ownership

The second input variable, current length of ownership, was computed by simply subtracting the most recent sale date from 2016. Paper sales were excluded. Figure 31 shows the current length of ownership distribution for 1- to 4-family homes in West Windsor. Since some homes did not have a sales date, they have been owned at least 39 years, as the oldest sales data were from 1978. From zero to three years of ownership, the number of homes is fairly uniform before declining in the fourth year of ownership. After the fourth year of ownership, the number of homes is fairly stable through 17 years of ownership. After this time, the number of homes then steadily decreases as the length of ownership increases. After 31 years of ownership, the number of homes at each ownership length is very small with fewer than 20 homes at each year of ownership. A total of 481 homes (6.0%) have never been sold, and therefore have been owned 39 or more 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 linking the West Windsor parcel-level property database with 2016-17 student address data, which was provided by the school district. Table 36 shows the student yields by length of ownership for the PK-12 student population. It is expected that longer-held homes will have fewer children, as they would have graduated from the district. For the 2016-17 school year, we were able to match 4,463 West Windsor resident students to an address in the West Windsor property database that had a Class 2 property code (1- to 4-family homes). Additional children lived either in apartments, farms, or were unmatched and were excluded from the analysis.

Figure 32 shows that, in general, student yields slowly increase, peaking at 1.01 children per housing unit at eight (8) years of ownership. Student yields then steadily decline as length of ownership increases. After 26 years of ownership, student yields are typically below 0.10 children per home. While there is a spike in the student yield at 37 years of ownership, this is misleading since there are very few homes at this length of ownership (seven homes) and one or two additional students can have a large impact on the student yield.

It should be noted that student yields by length of ownership may change over time. The distribution shown represents the student yields based on the 2016-17 enrollment data and should be considered as a “snapshot” in time. There is no way of predicting what the future student yield distribution by length of ownership will be. In comparing the student yield distribution from the January 2013 demographic study to the distribution in this study, they are fairly similar. In 2013, peak student yield (1.02) occurred at five years of ownership before declining.

Figure 31
Current Number of Homes by Length of Ownership
West Windsor Township

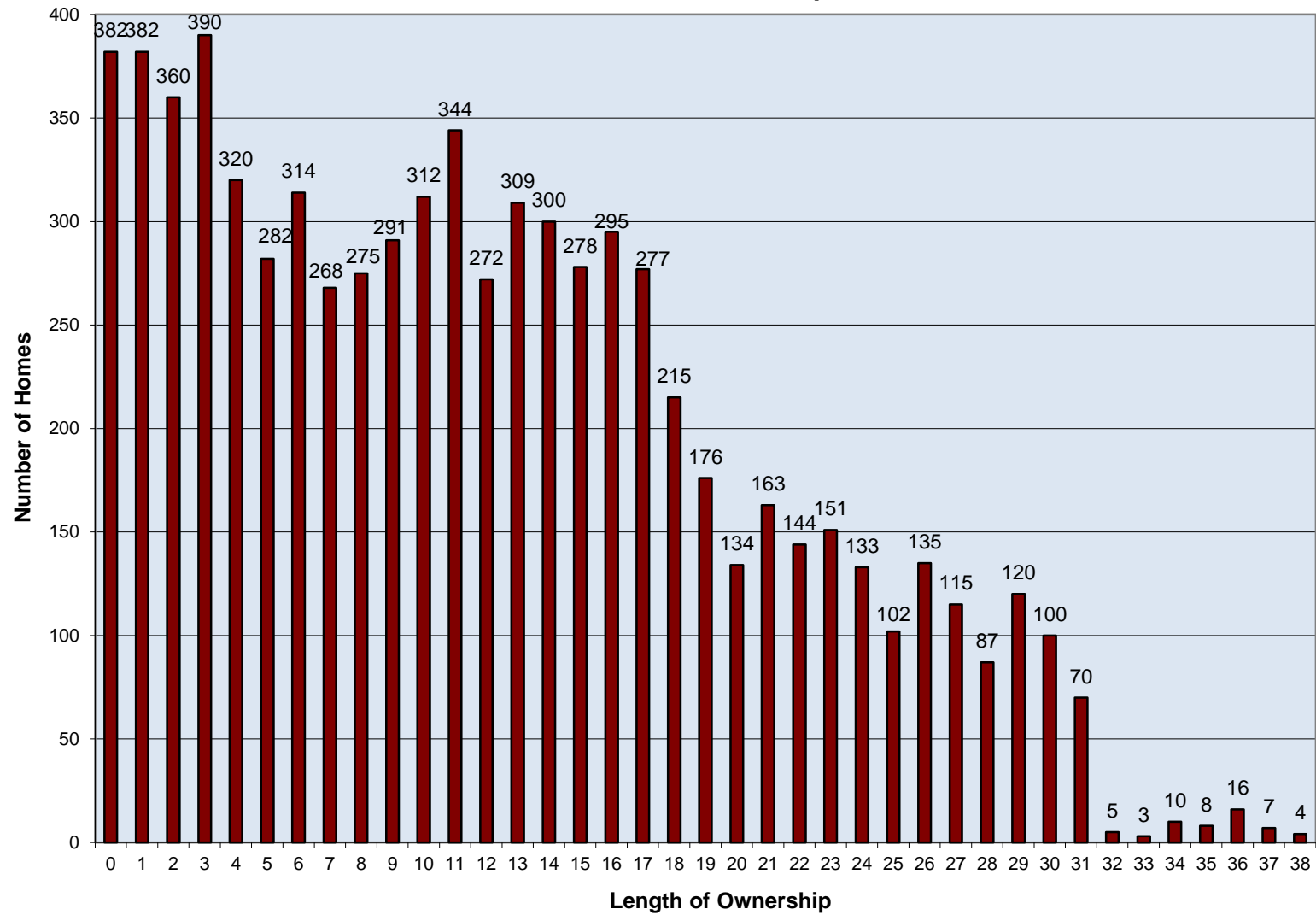
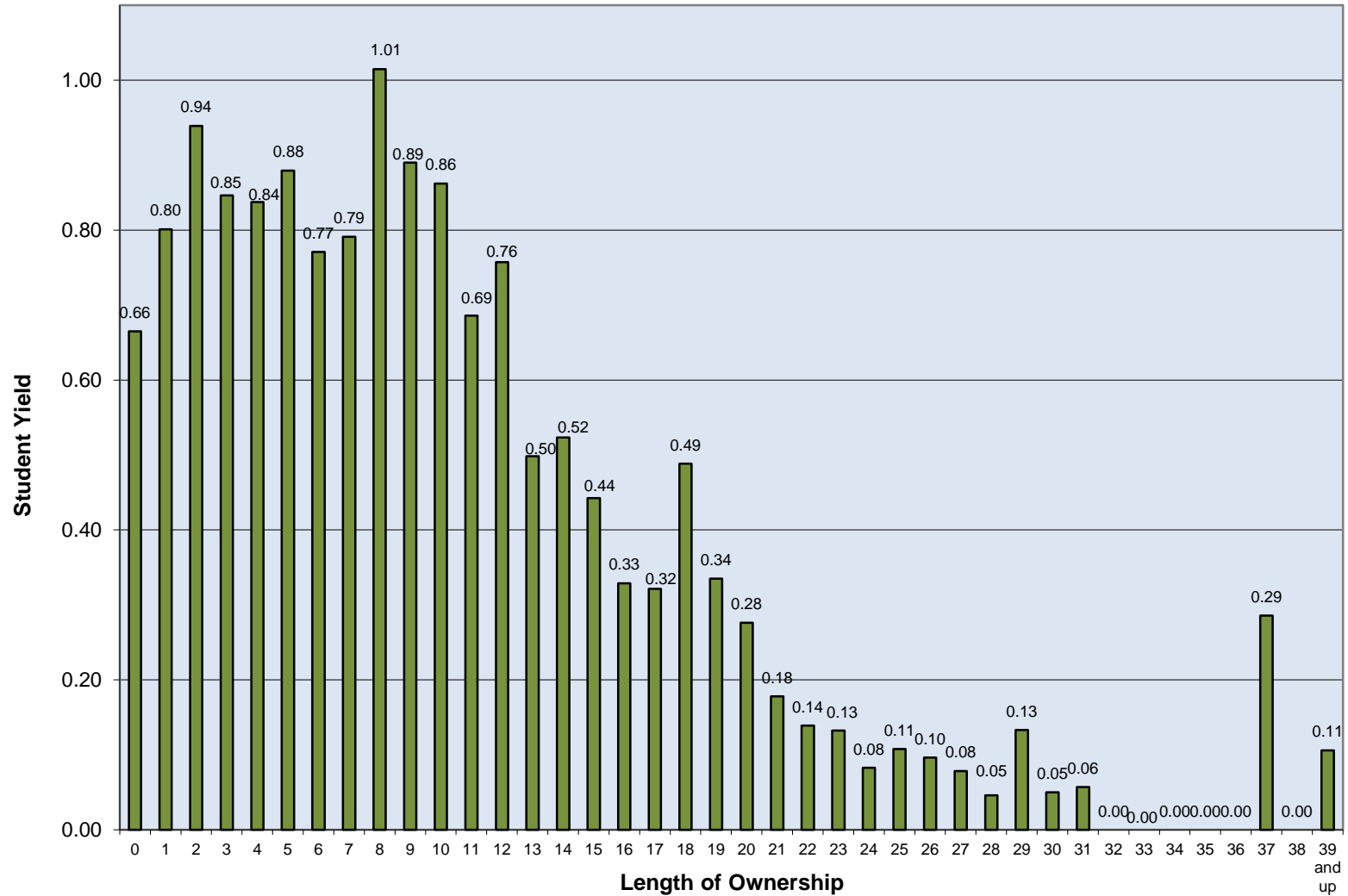


Table 36
Student Yields by Current Length of Ownership
West Windsor Township

Years of Ownership	Number of Homes 2016-17	Number of Students 2016-17	Student Yield
0	382	254	0.66
1	382	306	0.80
2	360	338	0.94
3	390	330	0.85
4	320	268	0.84
5	282	248	0.88
6	314	242	0.77
7	268	212	0.79
8	275	279	1.01
9	291	259	0.89
10	312	269	0.86
11	344	236	0.69
12	272	206	0.76
13	309	154	0.50
14	300	157	0.52
15	278	123	0.44
16	295	97	0.33
17	277	89	0.32
18	215	105	0.49
19	176	59	0.34
20	134	37	0.28
21	163	29	0.18
22	144	20	0.14
23	151	20	0.13
24	133	11	0.08
25	102	11	0.11
26	135	13	0.10
27	115	9	0.08
28	87	4	0.05
29	120	16	0.13
30	100	5	0.05
31	70	4	0.06
32	5	0	0.00
33	3	0	0.00
34	10	0	0.00
35	8	0	0.00
36	16	0	0.00
37	7	2	0.29
38	4	0	0.00
39+	481	51	0.11

Figure 32
Student Yields by Length of Ownership
West Windsor Township



2. Plainsboro Township

Turnover Rates

Like West Windsor, Plainsboro parcel-level data were also obtained from the Monmouth County Tax Board database. The earliest sale date utilized from the database was 1978, providing 38 years of historical sale data through 2016.

Figure 33 shows the distribution of turnover rates by length of ownership in Plainsboro from 1985-2000 using a 3-year moving average to smooth out unusual year-to-year variations in the turnover rates. Although data were collected from 1978-2016, turnover rates for homes sold before 1985 are not shown as sales data were limited. In addition, home sales after 2000 are not shown, as they would only have maximum lengths of ownership of 16 years or less. As the figure shows, the shape of the distribution is quite different than West Windsor's. Turnover rates increased for longer lengths of ownership before declining.

In Figure 34 following, weighted-average turnover rates by length of ownership are shown, which combines length of ownership data from all of the historical years. This data takes into account all housing market cycles, both when the housing market was very strong, such as the early to mid-2000s, and when it was weak, such as the period after the banking and financial crises of 2008. As the figure shows, turnover rates are greatest at 21 years of home ownership. At lengths of ownership exceeding 23 years, turnover rates were between 3-4%, which is much greater than West Windsor's, which typically ranged from 1-2%.

Current Distribution of Homes by Length of Ownership

As discussed previously, the second input variable, current length of ownership, was computed by simply subtracting the most recent sale date from 2016. Figure 35 shows the current length of ownership distribution for 5,491 1- to 4-family homes in Plainsboro. Since some homes did not have a sales date, they have been owned at least 39 years, as the oldest sales data used were from 1978. Plainsboro's greatest number of homes occurred at zero years of ownership, indicating newly purchased homes. In general, the number of homes then steadily decreases as the length of ownership increases. Only 88 homes (1.6%) have never been sold, and therefore have been owned 39 or more years, which is a much smaller number than that of West Windsor (481). In essence, Plainsboro does not have a large number of homes with long lengths of ownership, indicating they are more likely to be sold than advance to a long-held home.

Figure 33
Turnover Rates by Length of Ownership
3-Year Moving Average in Plainsboro Township
1985-2000

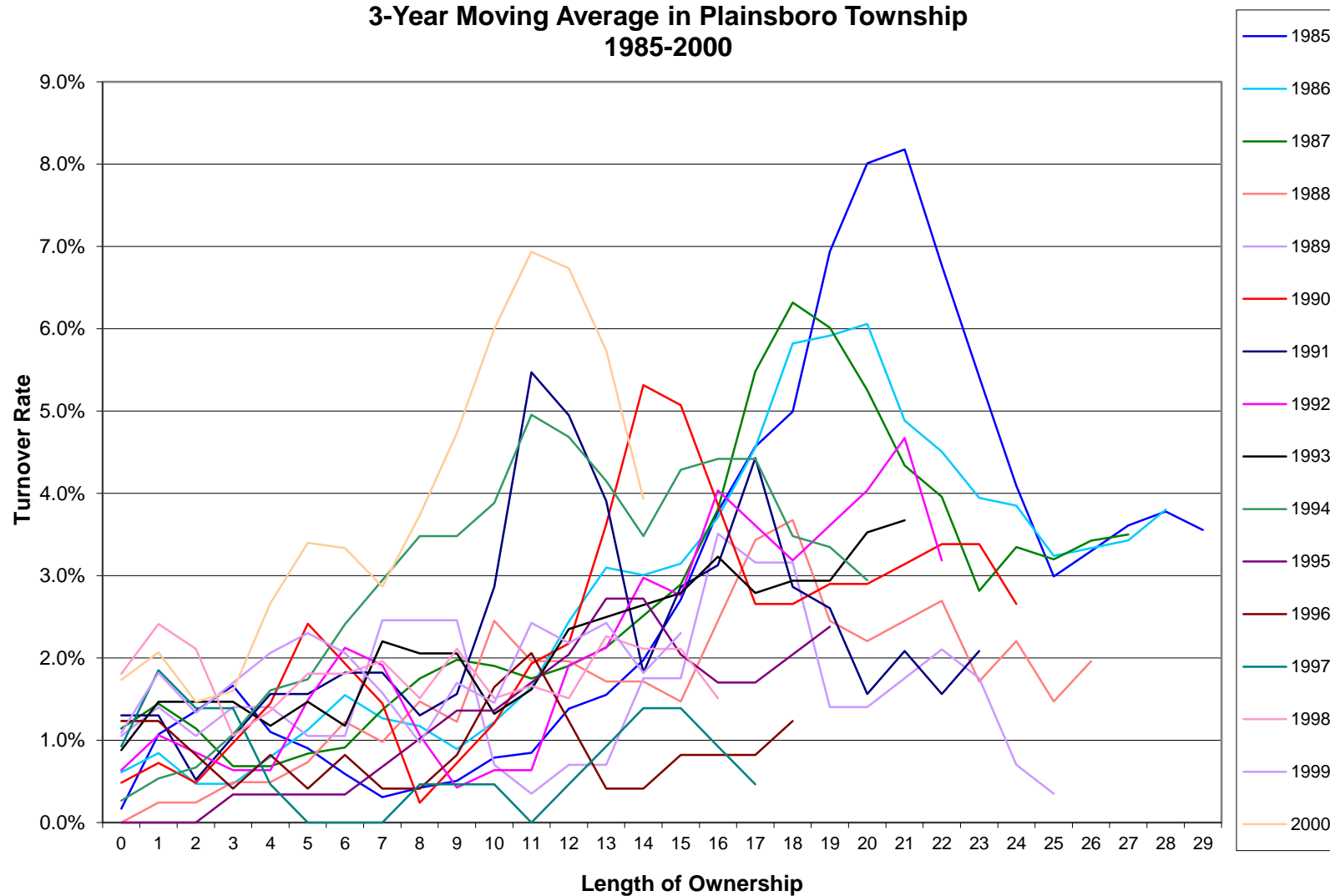


Figure 34
Historical Weighted-Average Turnover Rates by Length of Ownership
Plainsboro Township

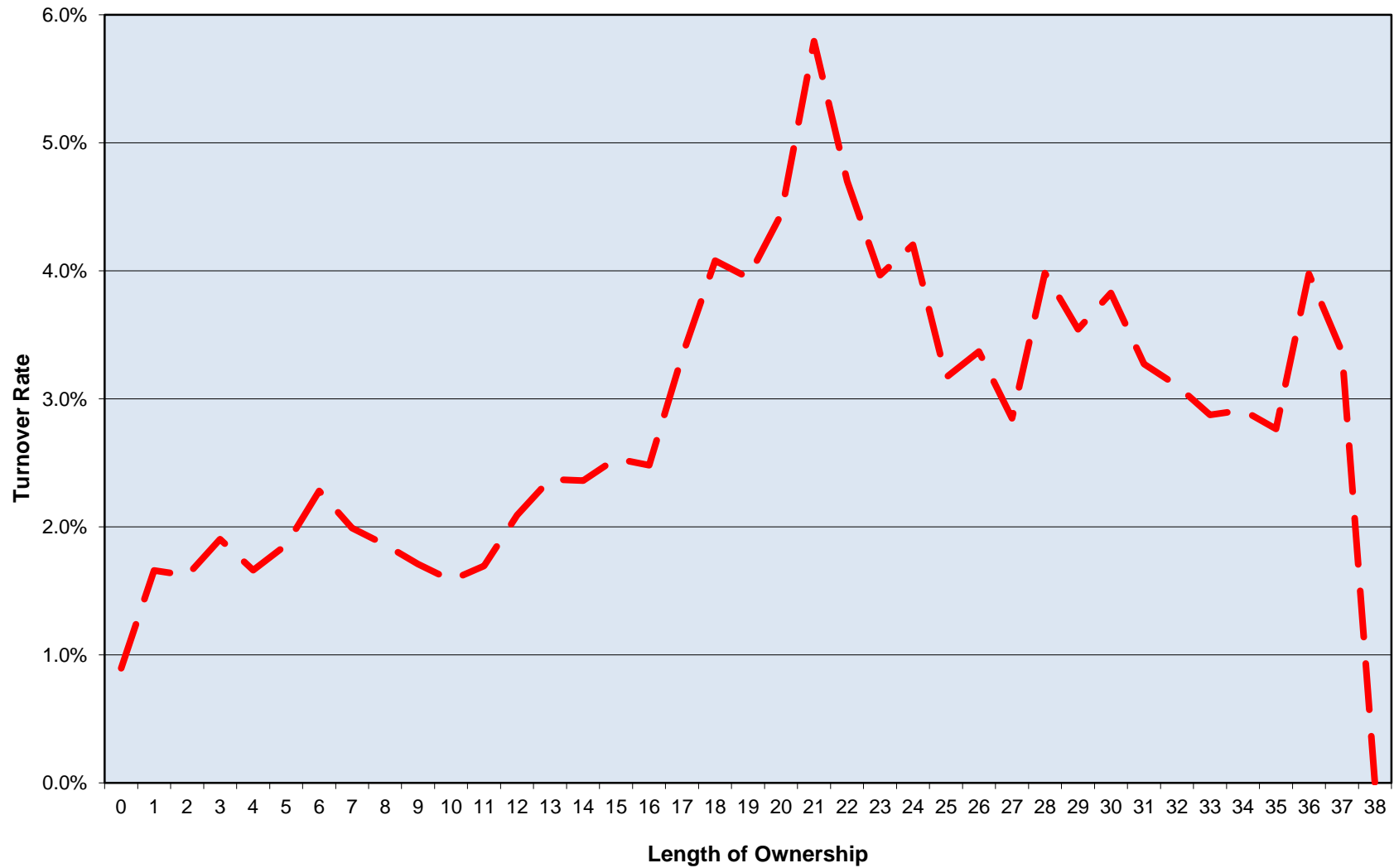
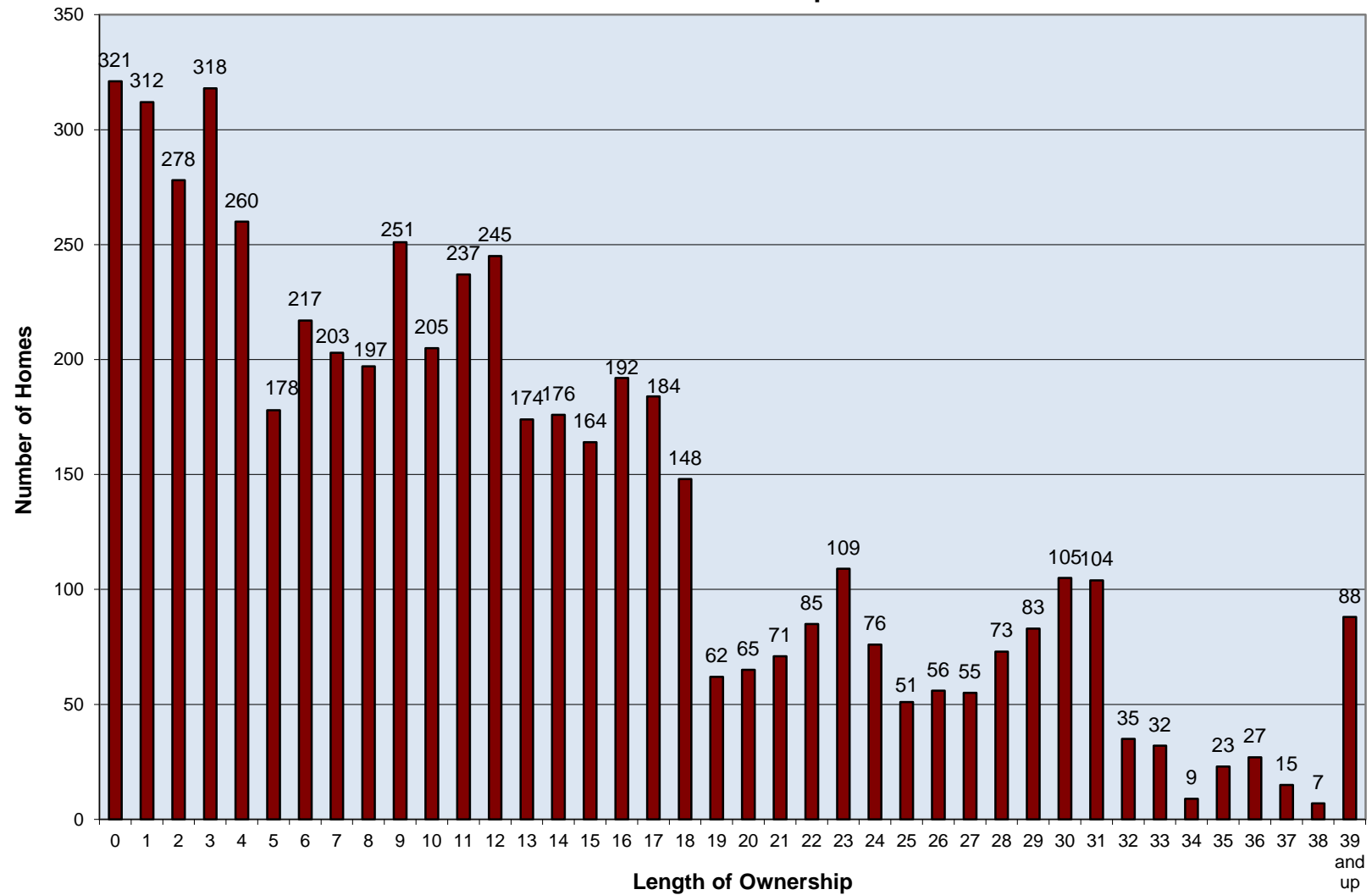


Figure 35
Current Number of Homes by Length of Ownership
Plainsboro Township



Student Yields by Length of Ownership

The third variable, student yields by length of ownership, was determined by linking the Plainsboro parcel-level property database with 2016-17 student address data, which was provided by the school district. Table 37 shows the student yields by length of ownership for the PK-12 student population. It is expected that longer-held homes will have fewer children, as they would have graduated from the district. We were able to match 2,843 Plainsboro resident students in 2016-17 to an address in the Plainsboro property database that had a Class 2 property code (1- to 4-family homes). Additional children lived either in apartments, farms, or were unmatched and were excluded from the analysis.

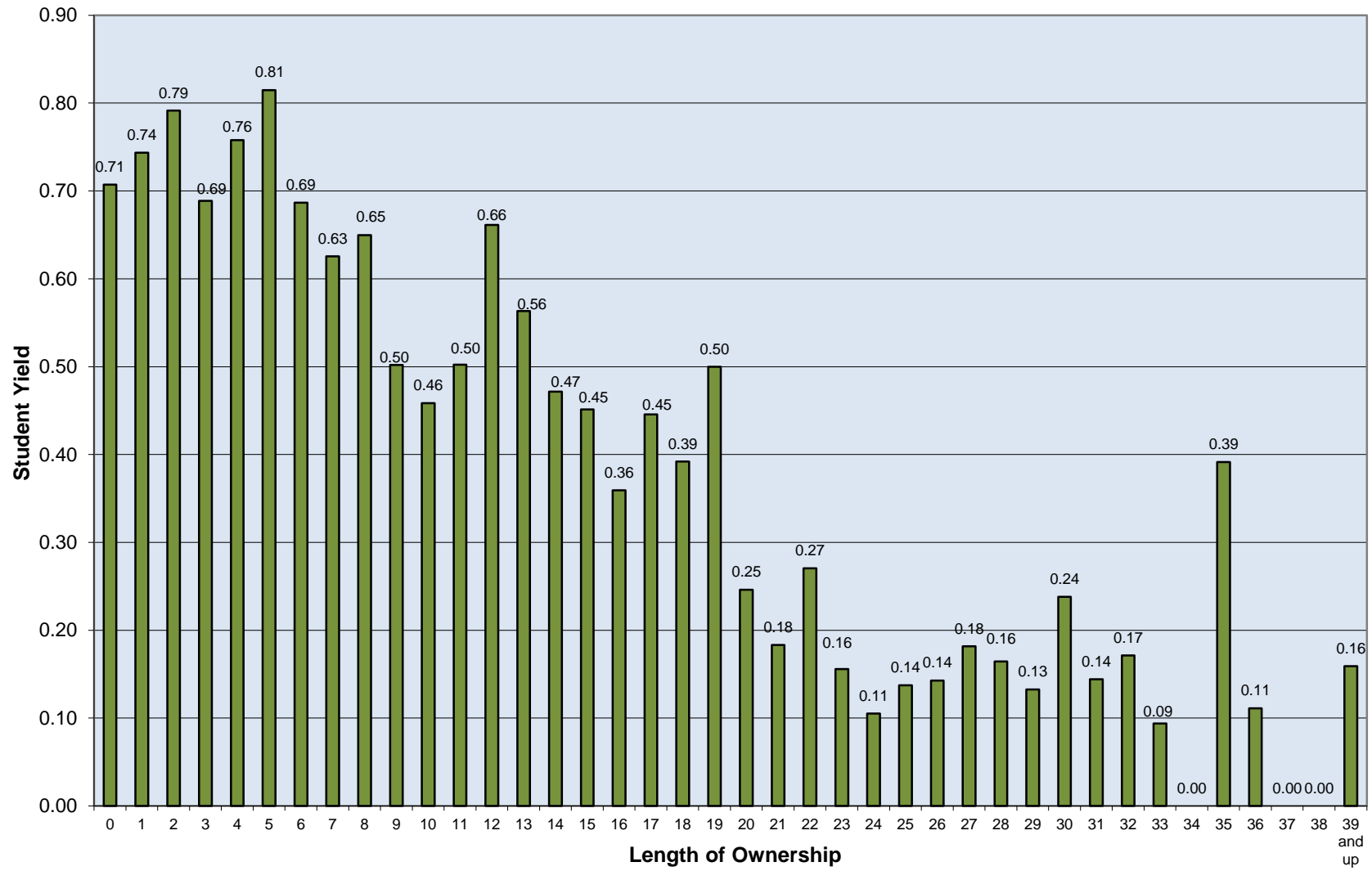
Figure 36 shows that, in general, student yields slowly increase, peaking at 0.81 children per housing unit at five (5) years of ownership, which is lower than the peak student yield in West Windsor (1.01). Student yields then steadily decline as length of ownership increases. After 22 years of ownership, student yields are typically below 0.20 children per home. While there is a spike in the student yield at 35 years of ownership, this is misleading since there are very few homes at this length of ownership (23 homes) and one or two additional students can have a large impact on the student yield.

As discussed previously, student yields by length of ownership may change over time. In comparing the Plainsboro student yield distribution from the January 2013 demographic study with the current distribution in this study, they are quite different. In 2013, student yields were fairly uniform through 14 years of ownership before declining. In 2013, peak student yield (0.75) occurred at eight years of ownership.

Table 37
Student Yields by Current Length of Ownership
Plainsboro Township

Years of Ownership	Number of Homes 2016-17	Number of Students 2016-17	Student Yield
0	321	227	0.71
1	312	232	0.74
2	278	220	0.79
3	318	219	0.69
4	260	197	0.76
5	178	145	0.81
6	217	149	0.69
7	203	127	0.63
8	197	128	0.65
9	251	126	0.50
10	205	94	0.46
11	237	119	0.50
12	245	162	0.66
13	174	98	0.56
14	176	83	0.47
15	164	74	0.45
16	192	69	0.36
17	184	82	0.45
18	148	58	0.39
19	62	31	0.50
20	65	16	0.25
21	71	13	0.18
22	85	23	0.27
23	109	17	0.16
24	76	8	0.11
25	51	7	0.14
26	56	8	0.14
27	55	10	0.18
28	73	12	0.16
29	83	11	0.13
30	105	25	0.24
31	104	15	0.14
32	35	6	0.17
33	32	3	0.09
34	9	3	0.00
35	23	9	0.39
36	27	3	0.11
37	15	0	0.00
38	7	0	0.00
39+	88	14	0.16

Figure 36
Student Yields by Length of Ownership
Plainsboro Township



Enrollment Projections Based on Housing Turnover

Projecting enrollment based on housing turnover is a process very similar to the Cohort-Survival Ratio (“CSR”) method, which is often used by demographers to project future student enrollments. As discussed previously, when using CSR, enrollments are projected based on historical “survival” ratios of students from one grade to the next. Average survival ratios are used to advance the current number of students into future grades. In the housing turnover method¹², 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 38 shows the process in greater detail. The West Windsor historical weighted average turnover rates by length of ownership are shown along with the current length of ownership distribution. The projected number of turnovers is computed (Column D) by multiplying the turnover rate at a length of ownership (Column B) by the number of homes at that same length of ownership (Column C). The number of homes that “survive” to be one year older is shown in Column E. Column F is identical to Column E except that the projected total number of homes sold in 2017, 222 from Column D, becomes the number of homes with zero years of ownership in the following year.

Table 39 shows the projected number of homes by length of ownership in West Windsor for 2017-2021 using the method described above assuming that the turnover rates presented in the table will continue into the future. However, if the average turnover rates are used, the predicted annual number of home sales (222 as shown in the table) would be much lower than that which occurred from 2014-2016 (383-388). The turnover rates reflect home selling patterns from an older historical period that may not be reflective of the current housing market. To increase the number of sales to current levels, the maximum turnover rate from the last twenty years was used for 0-19 years of ownership.

Finally, one of the key variables affecting future enrollments in the housing turnover model is the number of long-held homes. As shown previously, student yields for homes with 26 or more years of ownership in West Windsor are typically less than 0.10. 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 20 or more years of ownership, to prevent them from advancing into long-held lengths of ownership with low student yields. Therefore, turnover rates for homes with 20 or more years of ownership were increased to 4.0% to increase the number of sales to current levels. Simply stated, this scenario seeks to minimize the number of

¹²The 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.

homes with long lengths of ownership and low student yields while maximizing the number of homes with short lengths of ownership and high student yields, and aims to keep the number of home sales at or near current levels.

A similar process was used to project the number of homes by length of ownership in Plainsboro from 2017-2021 as shown in Table 40. Like West Windsor, if the average turnover rates are used, the predicted annual number of home sales (approximately 125-130 per year) would be much lower than that which occurred from 2014-2016 (302-329). To increase the number of sales to current levels, the maximum turnover rate from the last twenty years was again used for 0-19 years of ownership. In addition, to reduce the number of homes with 20 or more years of ownership that have low student yields and to increase home sales to current levels, turnover rates were increased to 5.5% for homes with 20 or more years of ownership.

Finally, Tables 41 and 42 show the projected number of West Windsor and Plainsboro students by length of ownership from 2017-2021. This was computed by multiplying the projected number of homes by length of ownership with the student yields by length of ownership in each respective community. After summing the projected number of students at each length of ownership, the output is the total number of students residing in Class 2 housing units in each year.

Table 43 combines the number of students from each community with the number of resident students living in apartment units, farms, or were unmatched (a constant) to derive the school district's total enrollment. 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. Figures 29 and 33 previously showed the variability in the turnover rates with length of ownership. As the table shows, the total number of students is projected to decline over the five-year projection period and be 9,319 in 2021-22.

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 this case, enrollment is not likely to grow due to housing turnover; other factors, such as higher fertility rates or new residential construction, would lead to enrollment growth.

Table 38
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	2.2%	382	8		222
1	4.1%	382	16	374	374
2	5.2%	360	19	366	366
3	5.5%	390	21	341	341
4	5.1%	320	16	369	369
5	4.8%	282	13	304	304
6	4.2%	314	13	269	269
7	4.0%	268	11	301	301
8	3.8%	275	10	257	257
9	3.5%	291	10	265	265
10	3.0%	312	9	281	281
11	2.8%	344	10	303	303
12	2.3%	272	6	334	334
13	2.2%	309	7	266	266
14	2.2%	300	6	302	302
15	2.0%	278	6	294	294
16	1.8%	295	5	272	272
17	1.8%	277	5	290	290
18	1.7%	215	4	272	272
19	1.4%	176	3	211	211
20	1.5%	134	2	173	173
21	1.2%	163	2	132	132
22	1.2%	144	2	161	161
23	1.0%	151	1	142	142
24	1.3%	133	2	150	150
25	0.8%	102	1	131	131
26	1.1%	135	1	101	101
27	1.1%	115	1	134	134
28	1.3%	87	1	114	114
29	1.1%	120	1	86	86
30	1.8%	100	2	119	119
31	1.1%	70	1	98	98
32	0.5%	5	0	69	69
33	2.1%	3	0	5	5
34	0.0%	10	0	3	3
35	2.5%	8	0	10	10
36	1.4%	16	0	8	8
37	3.7%	7	0	16	16
38	0.0%	4	0	7	7
39 and up	0.0%	481	0	485	485
Total		8,030	222		

Table 39
Projected Number of Homes in West Windsor by Length of Ownership
2017-2021

Years of Ownership	Average Turnover Rate	Turnover Rate Used	2016 (Actual)	2017	2018	2019	2020	2021
0	2.2%	4.3%	382	379	374	374	376	373
1	4.1%	9.1%	382	366	363	358	358	360
2	5.2%	7.8%	360	347	333	330	325	325
3	5.5%	9.2%	390	332	320	307	304	300
4	5.1%	7.0%	320	354	301	291	279	276
5	4.8%	7.0%	282	298	329	280	271	259
6	4.2%	5.5%	314	262	277	306	260	252
7	4.0%	5.0%	268	297	248	262	289	246
8	3.8%	4.6%	275	255	282	236	249	275
9	3.5%	5.1%	291	262	243	269	225	238
10	3.0%	4.4%	312	276	249	231	255	214
11	2.8%	4.2%	344	298	264	238	221	244
12	2.3%	2.2%	272	330	285	253	228	212
13	2.2%	3.1%	309	266	323	279	247	223
14	2.2%	2.1%	300	299	258	313	270	239
15	2.0%	2.5%	278	294	293	253	306	264
16	1.8%	2.3%	295	271	287	286	247	298
17	1.8%	1.9%	277	288	265	280	279	241
18	1.7%	2.7%	215	272	283	260	275	274
19	1.4%	6.3%	176	209	265	275	253	268
20	1.5%	4.0%	134	165	196	248	258	237
21	1.2%	4.0%	163	129	158	188	238	248
22	1.2%	4.0%	144	156	124	152	180	228
23	1.0%	4.0%	151	138	150	119	146	173
24	1.3%	4.0%	133	145	132	144	114	140
25	0.8%	4.0%	102	128	139	127	138	109
26	1.1%	4.0%	135	98	123	133	122	132
27	1.1%	4.0%	115	130	94	118	128	117
28	1.3%	4.0%	87	110	125	90	113	123
29	1.1%	4.0%	120	84	106	120	86	108
30	1.8%	4.0%	100	115	81	102	115	83
31	1.1%	4.0%	70	96	110	78	98	110
32	0.5%	4.0%	5	67	92	106	75	94
33	2.1%	4.0%	3	5	64	88	102	72
34	0.0%	4.0%	10	3	5	61	84	98
35	2.5%	4.0%	8	10	3	5	59	81
36	1.4%	4.0%	16	8	10	3	5	57
37	3.7%	4.0%	7	15	8	10	3	5
38	0.0%	4.0%	4	7	14	8	10	3
39 and up	0.0%	4.0%	481	466	454	449	439	431
Total			8,030	8,030	8,030	8,030	8,030	8,030

Table 41
Projected Number of West Windsor Students
Based on Length of Ownership and Student Yields
2017-2021

Years of Ownership	Yield	2016 (Actual)	2017	2018	2019	2020	2021
0	0.66	254	252	249	249	250	248
1	0.80	306	293	291	287	287	288
2	0.94	338	326	313	310	305	305
3	0.85	330	281	271	260	257	254
4	0.84	268	296	252	244	234	231
5	0.88	248	262	289	246	238	228
6	0.77	242	202	213	236	200	194
7	0.79	212	235	196	207	229	195
8	1.01	279	259	286	239	253	279
9	0.89	259	233	216	239	200	212
10	0.86	269	238	215	199	220	185
11	0.69	236	204	181	163	152	167
12	0.76	206	250	216	192	173	161
13	0.50	154	133	161	139	123	111
14	0.52	157	156	135	164	141	125
15	0.44	123	130	130	112	135	117
16	0.33	97	89	94	94	81	98
17	0.32	89	93	85	90	90	77
18	0.49	105	133	138	127	134	134
19	0.34	59	70	89	92	85	90
20	0.28	37	46	54	68	71	65
21	0.18	29	23	28	33	42	44
22	0.14	20	22	17	21	25	32
23	0.13	20	18	20	16	19	23
24	0.08	11	12	11	12	9	12
25	0.11	11	14	15	14	15	12
26	0.10	13	9	12	13	12	13
27	0.08	9	10	7	9	10	9
28	0.05	4	5	6	4	5	6
29	0.13	16	11	14	16	11	14
30	0.05	5	6	4	5	6	4
31	0.06	4	5	6	4	6	6
32	0.00	0	0	0	0	0	0
33	0.00	0	0	0	0	0	0
34	0.00	0	0	0	0	0	0
35	0.00	0	0	0	0	0	0
36	0.00	0	0	0	0	0	0
37	0.29	2	4	2	3	1	1
38	0.00	0	0	0	0	0	0
39 and up	0.11	51	49	48	48	47	46
Total		4,463	4,369	4,264	4,155	4,066	3,986

Table 42
Projected Number of Plainsboro Students
Based on Length of Ownership and Student Yields
2017-2021

Years of Ownership	Yield	2016 (Actual)	2017	2018	2019	2020	2021
0	0.71	227	224	225	223	223	224
1	0.74	232	229	227	228	226	226
2	0.79	220	234	232	229	230	229
3	0.69	219	183	194	192	190	191
4	0.76	197	227	189	201	199	196
5	0.81	145	201	231	193	205	203
6	0.69	149	115	159	183	152	162
7	0.63	127	128	98	136	156	131
8	0.65	128	122	122	94	131	149
9	0.50	126	93	88	88	68	94
10	0.46	94	109	80	76	77	59
11	0.50	119	96	112	82	78	79
12	0.66	162	149	120	140	102	98
13	0.56	98	129	118	96	111	82
14	0.47	83	75	98	90	73	84
15	0.45	74	76	68	89	82	67
16	0.36	69	55	56	51	66	61
17	0.45	82	79	63	65	58	77
18	0.39	58	69	66	53	54	49
19	0.50	31	70	83	80	64	66
20	0.25	16	14	32	37	36	29
21	0.18	13	11	10	22	26	25
22	0.27	23	18	16	14	31	37
23	0.16	17	12	10	9	7	17
24	0.11	8	11	8	6	5	5
25	0.14	7	10	13	10	8	7
26	0.14	8	7	10	13	10	8
27	0.18	10	10	8	12	16	12
28	0.16	12	9	8	7	10	13
29	0.13	11	9	6	6	5	8
30	0.24	25	19	15	11	10	9
31	0.14	15	14	11	9	6	6
32	0.17	6	17	16	12	10	7
33	0.09	3	3	9	8	6	5
34	0.00	3	0	0	0	0	0
35	0.39	9	4	11	11	32	31
36	0.11	3	2	1	3	3	9
37	0.00	0	0	0	0	0	0
38	0.00	0	0	0	0	0	0
39 and up	0.16	14	14	16	19	21	21
Total		2,843	2,847	2,829	2,798	2,787	2,776

Table 43
Projected Number of West Windsor-Plainsboro Regional Students
Based on Length of Ownership and Student Yields
2017-2021

	2017	2018	2019	2020	2021
West Windsor	4,369	4,264	4,155	4,066	3,986
Plainsboro	2,847	2,829	2,798	2,787	2,776
Students from apartments, farms, or unmatched locations	2,557	2,557	2,557	2,557	2,557
Total	9,773	9,650	9,510	9,410	9,319

Appendix

Table A1
Pending Residential Developments in West Windsor

Subdivision/ Developer	Attendance Areas	Location	Number of Units	Bedroom Distribution	Housing Type	Notes
Four Hundred Steps	TBD	Cranbury Road	100	TBD	Apartment	Currently discussing options with township officials. Might be dorm space for Princeton University students
Transit Village (District 1)	MH-VIL- GMS-HSS	Washington Road	800	TBD	Townhouse/ Apartment Market-rate and affordable	Project is a mixed-use Transit-Oriented Development (TOD). 100 units (12.5%) to be set aside as affordable units. A new developer is in negotiations with township. Students expected in 2020.
Lowes Center- Garden Homes	MH-VIL- GMS-HSS	Old Meadow Road	650	TBD	Apartments, Market-rate and affordable	Has not received approval. Approximately 162 units (25%) to be set aside as affordable units. Students expected in 2021.
American Properties (Thompson Property)	DN-VIL- GMS-HSS	Old Trenton Road	179	TBD	Townhouse, Market-rate and affordable	Has not received approval.
Howard Hughes Property	TBD	Quakerbridge Road/Clarksville Road, Route 1	1,976 (927 APT, 353 TH, 460 SF, 236 Age-Restricted)	TBD	Apartment, Townhouse, Single-Family	Former American Cyanamid site currently zoned for research and office manufacturing. Construction might take place in three phases over a 15-year period.

Pending New Developments in West Windsor

As shown in Table A1, there are several pending developments in West Windsor that have not received approval. An estimate was made of the number of public school children that could potentially come from these developments. It should be clearly stated that this is a rough estimate, as specific details of the proposed developments, such as bedroom distribution, were unavailable, which are needed to compute the estimated number of public school children. Due to the unavailability of the bedroom distributions for each development and the uncertainty of whether the proposed residential developments will get constructed, as well as the timeline of occupation, the baseline enrollment projections were not adjusted for the additional children anticipated from these pending developments. It is recommended that the Board continue to monitor the status of these developments to determine the future impact on the school district.

To compute the estimated number of public school children, several assumptions were made:

1. All detached single-family homes in Howard Hughes were assumed to have the following student yield multiplier: 1.13¹³.
2. All market-rate and affordable apartment units (Howard Hughes, Lowes Center, Transit Village and Four Hundred Steps) were assumed to have the township's average student yield multiplier for apartments: 0.53.
3. All market-rate and affordable townhouse units (Howard Hughes and American Properties) were assumed to have the township's average student yield multiplier for townhouses: 0.51.

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

- Four Hundred Steps – 53
- Transit Village – 424
- Lowes Center – 345
- American Properties – 91
- Howard Hughes – 1,191

In total, 2,104 public school children are projected to be generated from the new housing developments. It should be noted that this estimate may be lower, particularly if the student yields in Transit Village and Four Hundred Steps, which will be located near the train station, are similar to that of transit-oriented developments (“TOD”). Historically, TODs have fewer students than housing developments not located near mass transit. In a study by the Rutgers University Center for Urban Policy Research (“CUPR”) ¹⁴, ten recently constructed TODs were analyzed to determine the number of public school children per housing unit. Of the ten developments, only one, Morristown, had a similar District Factor Group to West Windsor and

¹³ As derived from the West Windsor current length of ownership for detached single-family homes.

¹⁴ Listokin, David, et al. (2006). *Who Lives in New Jersey Housing?*, Rutgers University Center for Urban Policy Research.

had a student yield of only 0.01 children per unit. Nine of the ten developments had yields of 0.10 public school children or less for each housing unit. In the 2,183 units they analyzed, there were a total of 47 public school children, a yield of 0.02 students per housing unit. Unfortunately, the existing data is limited in projecting the number of children from a TOD. If the data from CUPR is used where Transit Village and Four Hundred Steps had 0.02 public school children per housing unit, only 18 children would come from these developments. This would lower the total number of students from the pending developments from 2,104 to 1,645.