Appendix   6
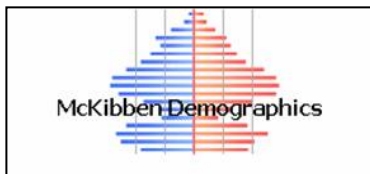
Demographics Study Report   6.1
Cropper GIS Consulting, LLC

Westwood Public Schools, MA Demographic Study

November 2014

Table of Contents

Executive Summary

1. Westwood Public School's fertility rates over the life of the forecasts are below replacement levels. (TFR=1.71 for the district vs. 2.1 for replacement level)

2. Most of the in-migration to the district occurs in the 0-4 and 30-to-44 year old age groups.

3. The locally born 18-to-24 year old population continues to leave the district, going to college or moving to other urban areas.

4. The primary factors causing the districts' enrollment to decrease are the small pre-school age cohorts aging into the school system. A secondary factor is the low rate of in-migration of young families ages 25 to 34.

5. Changes in year-to-year total enrollment (particularly until 2024) will primarily be due to the size of the cohorts entering the school system (grades K and 1) in relation to the size of the cohorts leaving the system (grade 12).

6. As the existing young families begin to age and similar sized grade cohorts begin to enter into the school system, total enrollment will begin to stabilize after 2024.

7. Even if the district continues to have a modest level of new home construction, the rate and magnitude of existing home sales will become the increasingly dominant factor affecting the amount of population and enrollment change.

8. Total enrollment is forecasted to decrease by 153 students, or -4.8%, between 2014-15 and 2019-20. Total enrollment will decline by 159 students, or -5.2%, from 2019-20 to 2024-25.

INTRODUCTION

By demographic principle, distinctions are made between projections and forecasts. A projection extrapolates the past (and present) into the future with little or no attempt to take into account any factors that may impact the extrapolation (e.g., changes in fertility rates, housing patterns or migration patterns) while a forecast results when a projection is modified by reasoning to take into account the aforementioned factors.

To maximize the use of this study as a planning tool, the ultimate goal is not simply to project the past into the future, but rather to assess various factors' impact on the future. The future population and enrollment growth of each school district is influenced by a variety of factors. Not all factors will influence the entire school district at the same level. Some variables may affect different areas at dissimilar magnitudes and rates causing changes at varying points of time within the same district. Forecaster's judgment based on a thorough and intimate study of the district has been used to modify the demographic trends and factors to more accurately predict likely changes. Therefore, strictly speaking, this study is a forecast, not a projection; and the amount of modification of the demographic trends varies between different areas of the district as well as within the timeframe of the forecast.

To calculate population forecasts of any type, particularly for smaller populations such as a school district or its attendance areas, realistic suppositions must be made as to what the future will bring in terms of age specific fertility rates, housing composition, family structure changes and residents' demographic behavior at certain points of the life course. The demographic history of the school district and its interplay with the social and economic history of the area is the starting point and basis of most of these suppositions particularly on key factors such as the age structure of the area. The unique nature of each district's and attendance area's demographic composition and rate of change over time must be assessed and understood to be factors throughout the life of the forecast series. Moreover, no two populations, particularly at the school district and attendance area level, have exactly the same demographic characteristics.

The manifest purpose of these forecasts is to ascertain the demographic factors and their magnitudes that will ultimately influence the enrollment levels in the district's schools. There are of course, other non-demographic factors that affect enrollment levels over time. These factors include, but are not limited to transfer policies within the district; student transfers to and from neighboring districts; placement of "special programs" within school facilities that may serve students from outside the attendance area; state or federal mandates that dictate the movement of students from one facility to another (No Child Left Behind is an excellent example of this factor); the development of charter schools in the district; the prevalence of home schooling in the area; and the dynamics of local private schools.

Unless the district specifically requests the calculation of forecasts that reflect the effects of changes in these non-demographic factors, their influences are held constant for the life of the forecasts. Again, the main function of these forecasts is to determine what impact demographic changes will have on future enrollment. It is quite possible to calculate special "scenario" forecasts to measure the impact and magnitude of school policy modifications as well as planned economic and financial changes. However in this case the results of these population and enrollment forecasts are meant to represent the most likely scenario for demographic changes over the next 10 years in the district and its attendance areas.

The first part of the report will examine the assumptions made in calculating the 10 year population forecasts for the Westwood Public Schools. Since the results of the population forecasts drive the subsequent enrollment forecasts, the assumptions listed in this section are paramount to understanding the area's demographic dynamics. The remainder of the report is an explanation and analysis of the district's population forecasts and how they will shape the district's grade level enrollment forecasts.

DATA

The data used for the forecasts come from a variety of sources. Enrollments by grade and attendance centers were provided by the Westwood Public Schools for school years 2008-2009 to 2014-15. Birth and death data were obtained from the Massachusetts Department of Public Health for the years 2000 through 2012. The net migration values were calculated using Internal Revenue Service migration reports for the years 2000 through 2011. The data used for the calculation of migration models came from the United States Bureau of the Census, 2005 to 2010, and the models were designed using demographic and economic factors. The base age-sex population counts used are from the results of the 2010 Census.

Recently the Census Bureau began releasing annual estimates of demographic variables at the block group and tract level from the American Community Survey (ACS). There has been wide scale reporting of these results in the national, state and local media. However, due to the methodological problems the Census Bureau is experiencing with their estimates derived from ACS data, particularly in areas with a population of less than 60,000, the results of the ACS are not used in these forecasts. For example, given the sampling framework used by the Census Bureau, each year only 150 of the over 5,200 current households in the district would have been included. For comparison, 800 households in the district were included in the sample for the long form questionnaire in the 2000 Census. As a result of this small sample size, the ACS survey results from the last 5 years must be aggregated to produce the tract and block group estimates.

To develop the population forecast models, past migration patterns, current age specific fertility patterns, the magnitude and dynamics of the gross migration, the age specific mortality trends, the distribution of the population by age and sex, the rate and type of existing housing unit sales, and future housing unit construction are considered to be primary variables. In addition, the change in household size relative to the age structure of the forecast area was addressed. While there was a drop in the average household size in Norfolk County as well as most other areas of the state during the previous 20 years, the rate of this decline has been forecasted to slow over the next ten years.

ASSUMPTIONS

For these forecasts, the mortality probabilities are held constant at the levels calculated for the year 2010. While the number of deaths in an area are impacted by and will change given the proportion of the local population over age 65, in the absence of an extraordinary event such as a natural disaster or a breakthrough in the treatment of heart disease, death rates rarely move rapidly in any direction, particularly at the school district or attendance area level. Thus, significant changes are not foreseen in district's mortality rates between now and the year 2024. Any increases forecasted in the number of deaths will be due primarily to the general aging of the district's population and specifically to the increase in the number of residents over age 65.

Similarly, fertility rates are assumed to stay fairly constant for the life of the forecasts. Like mortality rates, age specific fertility rates rarely change quickly or

dramatically, particularly in small areas. Even with the recently reported rise in the fertility rates of the United States, overall fertility rates have stayed within a 10% range for most of the last 40 years. In fact, the vast majority of year to year change in an area's number of births is due to changes in the number of women in child bearing ages (particularly ages 20-34) rather than any fluctuation in an area's fertility rate.

The total fertility rate (TFR), the average number of births a woman will have in her lifetime, is estimated to be 1.71 for the total district for the ten years of the population forecasts. A TFR of 2.1 births per woman is considered to be the theoretical "replacement level" of fertility necessary for a population to remain constant in the absence of in-migration. Therefore, over the course of the forecast period, fertility will not be sufficient, in the absence of net in migration, to maintain the current level of population within the Westwood Public Schools.

A close examination of data for Westwood Public Schools has shown the age specific pattern of net migration will be nearly constant throughout the life of the forecasts. While the number of in and out migrants has changed in past years for Westwood Public Schools (and will change again over the next 10 years), the basic age pattern of the migrants has stayed nearly the same over the last 40 years. Based on the analysis of data it is safe to assume this age specific migration trend will remain unchanged into the future. This pattern of migration shows high out-migration occurring in the locally born 18-to-24 year old age group as young adults leave the area to go to college or move to other urban areas. The second group of out-migrants is those householders aged 70 and older who are downsizing their residences. Most of the local in-migration occurs in the 0-4 and 30-44 age groups (bulk of which is from areas within 50 miles of the city of Westwood) primarily consisting of younger adults.

As the city of Westwood is not currently contemplating any major expansions or contractions, the forecasts also assume the current economic, political, transportation and public works infrastructure (with a few notable exceptions), social, and environmental factors of Westwood Public Schools and its attendance areas will remain the same through the year 2024.

Below is a list of assumptions and issues that are specific to the town of Westwood and Westwood Public Schools. These issues have been used to modify the population forecast models to more accurately predict the impact of these factors on each area's population change. Specifically, the forecasts for Westwood Public Schools assume that throughout the study period:

a. There will be no short term economic recovery in the next 18 months and the national, state or regional economy does not go into deep recession at any time during the 10 years of the forecasts; (Deep recession is defined as four consecutive quarters where the GDP contracts greater than 1% per quarter)

b. Interest rates have reached a historic low and will not fluctuate more than one percentage point in the short term; the interest rate for a 30 year fixed home mortgage stays below 5.5%;

c. The rate of mortgage approval stays at 1999-2002 levels and lenders do not return to "sub-prime" mortgage practices;

d. There are no additional restrictions placed on home mortgage lenders or additional bankruptcies of major credit providers;

e. The rate of housing foreclosures does not exceed 125% of the 2005-2007 average of Norfolk County for any year in the forecasts;

f. All currently planned, platted, and approved housing developments are built out and completed by 2023. All housing units constructed are occupied by 2024;

g. The unemployment rates for Norfolk County will remain below 6.5% for the 10 years of the forecasts;

h. The rate of students transferring into and out of Westwood Public Schools will remain at the 2008-09 to 2014-15 average;

i. The inflation rate for gasoline will stay below 5% per year for the 10 years of the forecasts;

j. There will be no building moratorium within the district;

k. Businesses within the district and Norfolk County will remain viable;

l. The number of existing home sales in the district that are a result of "distress sales" (homes worth less than the current mortgage value) will not exceed 20% of total homes sales in the district for any given year;

m. Housing turnover rates (sale of existing homes in the district) will remain at their current levels. The majority of existing home sales are made by home owners over the age of 55;

n. Private school and home school attendance rates will remain constant;

o. The recent decline in new home construction has ended and building rates have stabilized;

p. The rate of foreclosures for commercial property remains at the 2004-2007 average for Norfolk County;

If a major employer in the district or in the Greater Norfolk County area closes, reduces or expands its operations, the population forecasts would need to be adjusted to reflect the changes brought about by the change in economic and employment conditions. The same holds true for any type of natural disaster, major change in the local infrastructure (e.g., highway construction, water and sewer expansion, changes in zoning regulations etc.), a further economic downturn, any additional weakness in the housing market or any instance or situation that causes rapid and dramatic population changes that could not be foreseen at the time the forecasts were calculated.

The high proportion of high school graduates from Westwood Public Schools that attend college or move to urban areas outside of the district for employment is a significant demographic factor. Their departure is a major reason for the extremely high out-migration in the locally born 18-to-24 age group and was taken into account when calculating these forecasts. The out-migration of graduating high school seniors is expected to continue over the period of the forecasts and the rate of out-migration has been forecasted to remain the same over the life of the forecast series. Given that the district will have progressively larger graduation classes over the next 10 years, (the 12th grade classes over the last four years have averaged 218, the average 12th grade class in 2021 to 2024 should be approximately 249) the number of out migrants from the district will increase.

Finally, all demographic trends (i.e., births, deaths, and migration) are assumed to be linear in nature and annualized over the forecast period. For example, if 1,000 births are forecasted for a 5-year period, an equal number, or proportion of the births are assumed to occur every year, 200 per year. Actual year-to-year variations do and will occur, but overall year to year trends are expected to be constant.

METHODOLOGY

The population forecasts presented in this report are the result of using the Cohort-Component Method of population forecasting (Siegel, and Swanson, 2004: 561-601) (Smith et. al. 2004). As stated in the **INTRODUCTION**, the difference between a projection and a forecast is in the use of explicit judgment based upon the unique features of the area under study. Strictly speaking, a cohort projection refers to the future

population that would result if a mathematical extrapolation of historical trends. Conversely, a cohort-component forecast refers to the future population that is expected because of a studied and purposeful selection of the components of change (i.e., births, deaths, and migration) and forecast models are developed to measure the impact of these changes in each specific geographic area.

Five sets of data are required to generate population and enrollment forecasts. These five data sets are:

1. a base-year population (here, the 2010 Census population for Westwood Public Schools and its attendance areas);
2. a set of age-specific fertility rates for each attendance area to be used over the forecast period;
3. a set of age-specific survival (mortality) rates for each attendance area;
4. a set of age-specific migration rates for each attendance area; and
5. Historical enrollment figures by grade.

The most significant and difficult aspect of producing enrollment forecasts is the generation of the population forecasts in which the school age population (and enrollment) is embedded. In turn, the most challenging aspect of generating the population forecasts is found in deriving the rates of change in fertility, mortality, and migration. From the standpoint of demographic analysis, Westwood Public Schools and its ten elementary attendance center districts are classified as "small area" populations (as compared to the population of the state of Massachusetts or to that of the United States). Small area population forecasts are more complicated to calculate because local variations in fertility, mortality, and migration may be more irregular than those at the regional, state or national scale. Especially challenging is the forecast of the migration rates for local areas, because changes in the area's socioeconomic characteristics can quickly change from past and current patterns (Peters and Larkin, 2002.)

The population forecasts for Westwood Public Schools and it attendance areas were calculated using a cohort-component method with the populations divided into male and female groups by five-year age cohorts that range from 0-to-4 years of age to 85 years of age and older (85+). Age and sex specific fertility, mortality, and migration models were constructed to specifically reflect the unique demographic characteristics of each of

Westwood Public Schools' attendance areas as well as the total school district.

The enrollment forecasts were calculated using a modified average survivorship method. Average survivor rates (i.e., the proportion of students who progress from one grade level to the next given the average amount of net migration for that grade level) over the previous five years of year-to-year enrollment data were calculated for grades two through twelve. This procedure is used to identify specific grades where there are large numbers of students changing facilities for non-demographic factors, such as private school transfers or enrollment in special programs.

The survivorship rates were modified or adjusted to reflect the average rate of forecasted in and out migration of 5-to-9, 10-to-14 and 15-to-17 year old cohorts to each of the attendance centers in Westwood Public Schools for the period 2005 to 2010. These survivorship rates then were adjusted to reflect the forecasted changes in age-specific migration the district should experience over the next five years. These modified survivorship rates were used to project the enrollment of grades 2 through 12 for the period 2010 to 2015. The survivorship rates were adjusted again for the period 2015 to 2020 to reflect the predicted changes in the amount of age-specific migration in the districts for the period.

The forecasted enrollments for kindergarten and first grade are derived from the 5-to-9 year old population of the age-sex population forecast at the elementary attendance center district level. This procedure allows the changes in the incoming grade sizes to be factors of forecasted population change and not an extrapolation of previous class sizes. Given the potentially large amount of variation in Kindergarten enrollment due to parental choice, changes in the state's minimum age requirement, and differing district policies on allowing children to start Kindergarten early, first grade enrollment is deemed to be a more accurate and reliable starting point for the forecasts. (McKibben, 1996) The level of the accuracy for both the population and enrollment forecasts at the school district level is estimated to be $\pm 2.0\%$ for the life of the forecasts.

RESULTS AND ANALYSIS OF THE POPULATION FORECASTS

From 2010 to 2020, the populations of Westwood Public Schools, Norfolk County; the state of Massachusetts, and the United States are forecasted to change as follows; Westwood Public Schools will decrease by -2.0%, Norfolk County will grow by 7.5% Massachusetts will increase by 5.1%; and the United States increase by 8.4% (see Table 1).

Table 1: Forecasted Population Change, 2010 to 2020

	2010	2015	2020	10-Year Change
U.S. (in millions)	308	322	334	8.4%
Massachusetts	6,547,629	6,692,000	6,883,000	5.1%
Norfolk County	670,850	695,200	721,400	7.5%
Westwood Public Schools	14,564	14,340	14,270	-2.0%

A number of general demographic factors will influence the growth rate of Westwood Public Schools during this period, and include the following:

a. The Baby Boom generation will have passed through prime childbearing ages by 2003, thereby reducing the overall proportion of the population at risk of having children;

b. The remaining population in childbearing ages (women ages 15-45) will have fewer children;

c. The locally born 18-to-24 year old population, in prime childbearing ages, will continue to leave the area to go to college or to other urban areas, with the magnitude of this out-migration flow slowly increasing; and,

d. The district will experience continued increase in housing stock, with an average of 30 new units being built each year through 2018. New housing construction will continue after that point, with an average of 20 units built per year until 2024.

Westwood Public Schools will continue to experience significant in-migration (movement of new young families into the district) over the next 10 years. However, the size and age structure of the pool of potential in-migrants will change and the effects of the in-migration of families on population growth will be greatly offset by the continued steady growing out-migration of young adults as graduating seniors continue to leave the district.

From 2010 to 2015, the district's total population is forecasted to decrease by 224 or -1.6% to 14,340. From 2015 to 2020, the population is forecasted to continue to decrease by an additional 70 persons or -0.5%. During the ten years of the forecasts, three of the five elementary attendance areas are forecasted to decrease in population with the decline rates ranging from -6.8% in the Deerfield area to -1.1% in the Downey area (See Table 2 for population forecast results of each elementary attendance area).

While all elementary areas will see some amount of gross in-migration, (primarily in the 24-to-39 age group,) all areas also will continue to see gross out-migration. This out-migration primarily will be young adults, 18-to-24 years old, as graduating seniors continue to leave the district to go to college or seek employment in larger urban areas. Consequently, most of the attendance areas will experience a modest reduction in their average household size.

As stated in the **ASSUMPTIONS** and emphasized above, the impact of the high proportion of high school graduates that leave the district to continue on to college or to seek employment in large urban areas is significant to the size and structure of the future population of the district. Up to 70% of all births occur to women between the ages of 20 and 29. As the graduating seniors continue to leave the district, the number of women at risk of childbirth during the next decade declines. Consequently, along with the district's fertility rate below the replacement level, the relatively small number of non-college women in the district ages 20-29 will keep the number of births declining at a modest rate despite the district having a stable population (see the population pyramids in the appendix of this report for a graphic representation of the age distributions of the district and all of the attendance areas).

Table 2: Forecasted Elementary Area Population Change, 2010 to 2020

	2010	2015	2010-2015 Change	2020	2015-2020 Change	2010-2020 Change
Deerfield	2,886	2,730	-5.7%	2,690	-1.5%	-6.8%
Downey	2,851	2,850	0.0%	2,820	-1.1%	-1.1%
Hanlon	2,191	2,220	1.3%	2,260	1.8%	3.1%
Martha Jones	3,052	3,040	-0.4%	3,060	0.7%	0.3%
Sheehan	3,584	3,500	-2.4%	3,440	-1.7%	-4.0%
District Total	14,564	14,340	-1.6%	14,270	-0.5%	-2.0%

As a general rule of thumb, for every two seniors that leave the district, one new household must move into the district to replace the young adults that

have left and to replace their lost potential fertility. Over the course of the forecast period, the average number of graduating seniors will be approximately 250 per year and at least 75% of them will move out of the district within three years of graduation. Using the general rule, approximately 90 new families will be required to move into the district every year or 900 new families for the ten-year study period to replace the graduating seniors and their lost fertility. It is forecasted that the impact of the steadily increasing out-migration of young adults will continue to be mostly offset by young family in-migration and that the total number of births will continue to slightly decline throughout the forecast period.

Another factor that needs to be considered is the birth dynamics of the last twenty years. An examination of national birth trends shows there was a large "Baby Boomlet" born between 1980 and 2000. This Boomlet was nearly as large as the Baby Boom of the 1950s and 1960s. However, unlike the Baby Boom, the Boomlet was a regional and not a national phenomenon (McKibben, et. al. 1999). Because Massachusetts had a rather modest Baby Boomlet, most of the expected enrollment growth will have to result from in-migration and not from an increase in the grade cohort size.

Table 3: Household Characteristics by Elementary Area, 2010 Census

	HH w/ Pop Under 18	% HH w/ Pop Under 18	Total Households	Household Population	Persons Per Household
Deerfield	363	30.3%	1199	2861	2.39
Downey	395	42.6%	928	2851	3.07
Hanlon	327	42.8%	764	2188	2.86
Martha Jones	480	49.1%	979	3052	3.12
Sheehan	527	38.6%	1363	3584	2.63
District Total	**2092**	**40.0%**	**5233**	**14536**	**2.78**

Clearly, the dominant factor that has affected the population growth rates of Westwood Public Schools over the last 20 years has been the number, pace and cost of existing home sales and the number of new homes constructed. However, the dynamics of this in migration flow are more complex than many realize. There is a common misconception that any changes in the economy, housing market or transportation system will have an immediate impact of the size of an area's population and the total impact of that change will be experienced immediately.

Chart 1: Residential Building Permits, Norfolk County, 2000 to 2013
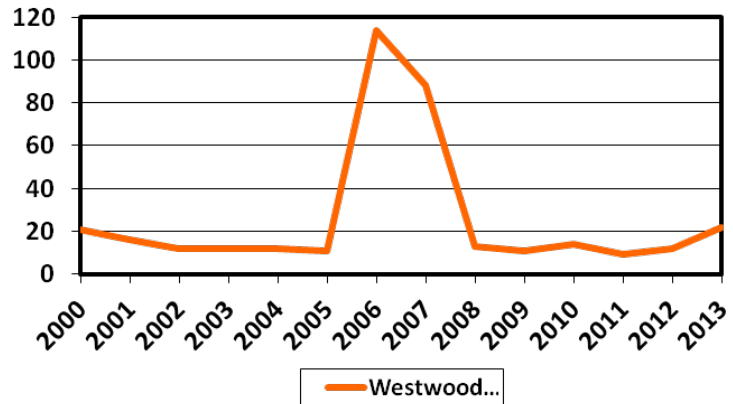
This "delayed demographic reaction" is a key issue when attempting to ascertain the impact and duration of a trend. While it is true that the households moving into these new housing units bring many school age (particularly elementary) children into the district, they also bring many preschool age children as well. Consequently, the full impact of the growth in existing home sales and new home construction is not seen immediately in elementary enrollment as it takes three to seven years for all of the children to age into the schools. This is a key issue since the number of births in Westwood Public Schools is insufficient to maintain current enrollment levels.

Of additional concern are the issues of the district's aging population and the growing number of "empty nest" households, particularly in the Martha Jones attendance area. For example, after the last school age child leaves high school, the household becomes an "empty nest" and most likely will not send any more children to the school system. In most cases, it takes 20 to 30 years before all original (or first time) occupants of a housing area move out and are replaced by new, young families with children. This principle also applies to children leaving elementary school and moving on to middle school. Households can still have school age children in the district's school, but also in effect be "empty nest" of elementary age children.

Table 4: Householder Characteristics by Elementary Districts, 2010 Census

	Percentage of Householders aged 35-54	Percentage of Householders aged 65+	Percentage of Householders Who Own Homes
Deerfield	31.9%	49.8%	83.5%
Downey	46.3%	28.9%	97.3%
Hanlon	49.4%	24.4%	86.2%
Martha Jones	53.5%	22.9%	97.0%
Sheehan	39.6%	36.0%	77.3%
District Total	**43.1%**	**33.8%**	**87.2%**

Note as well the stabilization in the median age of the population in Westwood Public Schools and all of its attendance areas (see population forecasts in the appendix for the median age for each forecast year). The district as a whole will see the median age of its population stay roughly the same from 43.9 in 2010 to 43.4 in 2025. This stable level in median age is due to the assumed continued out migration of elderly homeowners who sell their existing homes to younger families (ages 30 to 44) with children (See Table 4).

As a result of the "empty nest" syndrome, the attendance areas in Westwood Public Schools will see a stable median age of their populations, even while the district as a whole continues to attract some new young families. It should be noted that many of these "childless" households are single persons and/or elderly (See Table 5). Consequently, even if many of these housing units "turnover" and attract households of similar characteristics, they will add little to the number of school age children in the district. Furthermore, many of the empty nest households will "down size" to smaller households within the district. In these cases new housing units may be built in an area, yet there is no corresponding increase in school enrollment.

There are several additional factors that are responsible for the difference between growth in population and growth in housing stock. Included among these factors are: people building new "move up" or retirement homes in the same area or district, (an important point since the children in move up homes tend to be of middle or high school age); children moving out of their parents homes and establishing residence in the same area; the increase in single-individual households; and divorce, with both parents remaining in the same area.

Table 5: Single Person Households and Single Person Households over age 65 by Elementary Districts, 2010 Census

	Percentage of Single Person Households	Percentage of Households single person and 65+
Deerfield	37.2%	32.6%
Downey	13.4%	7.8%
Hanlon	18.7%	8.1%
Martha Jones	12.7%	7.7%
Sheehan	25.6%	18.5%
District Total	**22.7%**	**16.3%**

RESULTS AND ANALYSIS OF ENROLLMENT FORECASTS

Elementary Enrollment (K-5)

The total K-5 elementary enrollment of the district is forecasted to decrease from 1,391 in 2014-15 to 1,273 in 2019-20, a drop of 118 students or 8.5%. From 2019-20 to 2024-25, elementary enrollment is expected to decline by an additional 75 students to 1,245. This will represent a -5.9% decrease over the five-year period. All five of the elementary attendance areas will experience a net decrease in enrollment over the next ten years (see Table 6).

The reason for this declining pattern in elementary enrollment is the convergence of the effects of three factors, all reaching their peak influence roughly by 2019. These factors are the existence of a "dearth" of population in the pre-school ages, the reversal of cohort sizes in the elementary grades and the aging out of households that currently have children under the age of 10. Each of these factors will contribute in part to the growth in elementary enrollment until 2024 and the slight decline afterwards.

There is currently a dearth of population in the district's pre-school population compared to the existing 2 to 7 year old population. An excellent example of this impact of the trend is shown in the single year of age counts of the district from the 2010 Census (See Table 7). The population at age six is closely related to the combined 1st grade enrollment of the public and private students in the district (as it is for all ages and elementary grades). However, note the relatively lower number of residents from age one to four, particularly when compared to the cohort sizes of the age 5 and 7 populations. This trend is an indication of the proportion of households in each area that will produce

elementary age students over the next five years. Despite a substantial in-migration of young families with children under the age of five, these very small "pre-school aged cohorts" will result in a decline in elementary enrollments over the next five to ten years.

Table 6: Total Elementary Enrollment, 2014, 2019, 2024

	2014	2019	*2014-2019 Change*	2024	*2019-2024 Change*	*2014-2024 Change*
Deerfield	247	225	*-8.9%*	223	*-0.9%*	*-9.7%*
Downey	250	227	*-9.2%*	215	*-5.3%*	*-14.0%*
Hanlon	226	228	*0.9%*	219	*-3.9%*	*-3.1%*
Martha Jones	295	264	*-10.5%*	249	*-5.7%*	*-15.6%*
Sheehan	373	314	*-15.8%*	292	*-7.0%*	*-21.7%*
District Total	**1,391**	**1,273**	*-8.5%*	**1,198**	*-5.9%*	***-13.9%***

Secondly, over the last several years, one of the main reasons elementary enrollment was decreasing was due to the fact that the number of children entering Kindergarten and 1st grade was smaller than the number leaving elementary school after completing 5th grade. This trend will continue over at least the next five years. Over the next five years the incoming 1st grade cohorts will average 243 students in size whereas the outgoing 5th grade cohorts have averaged only 211. As long as this imbalance continues (and it is forecasted to do so for at least the next five years) there will be growth in the elementary grades.

The third factor is the rise of the number of empty nest households in the district. In 2010 the district had 43.1% of their households headed by people ages 35-54 (The ages most people have school aged children). The district's proportion of households in these age groups has dropped over the last five years as people aged and the households became empty nest. Unfortunately, the large bubble of now empty nest households, (particularly empty of elementary age students) will not reach their 70s during the life of these forecasts. Post 70 year old households are the stage of life when most downsize, allowing new young families with children to move in.

Table 7: Age Under One to Age Ten Population Counts, by Year of Age, by Elementary Attendance Area: 2010 Census

	Under 1 year	1 year	2 years	3 years	4 years	5 years	6 years	7 years	8 years	9 years	10 years
Deerfield	20	16	23	40	24	41	44	45	49	58	52
Downey	22	20	31	23	41	40	51	53	39	52	60
Hanlon	21	22	33	21	48	29	43	43	43	40	54
Martha Jones	20	28	29	40	45	53	54	68	65	74	70
Sheehan	26	45	36	57	39	65	73	65	55	64	60
Total	**109**	**131**	**152**	**181**	**196**	**228**	**264**	**274**	**251**	**288**	**295**

The demographic factors that will become the most influential over the next ten years are the growth rate of empty nest household in the attendance areas, the number of sales of new and existing homes, the rate and magnitude of existing housing unit "turn over," the relative size of the elementary and pre-school age cohorts and each area's fertility rate. Each of these factors will vary in the scale of their influence and timing of impact on the enrollment trends of any particular elementary area.

As more elementary attendance areas become completely dependent upon existing home sales to attract new families, the overall elementary enrollment trend of the district will decline. Areas such as Hanlon will see their elementary enrollments peak by the end of the decade and then slowly decline. Thus, the best primary short- and long-term indicator for enrollment change in most of the attendance area will be the year-to-year rate of housing turnover. If the Total Fertility Rates of all the attendance areas remain at their current low levels (and they are forecasted to do so) they will insure that enrollments will continue to see slowing growth (or outright declines) even if the levels of net out-migration are greatly reduced.

It is important to note that not all new housing construction results in an increase in elementary enrollment. Frequently in cases where the new home construction is primarily move up houses (priced $417,000 or higher, the lower limits of a jumbo mortgage until 2008) the impact on enrollment is felt more at the middle and high school levels than at the elementary level. These homes are usually purchased by families who have completed their childbearing and the children they do have tend to be ages 10 and older.

Yet equally important are the factors of housing turn-over and "family formation." Areas with existing homes that have a large proportion of housing units owned by their residents and have a large proportion of their homeowners age 65 or older are prime candidates to experience a growing amount of housing turn-over. In Westwood Public Schools an area

such as Deerfield Elementary is an excellent example of this trend. This area, which would normally see a larger drop in its enrollment numbers as the number of households with school age children decline, will see more moderate changes in its student populations as young families move into formerly empty nest housing units.

Additionally, sub-areas that are characterized by the relatively high percentage of rental housing units and large concentrations of young adults tend to have more stable population distribution and enrollment trends. In these cases, young adults or the newly married, move to these areas and establish households. Because the population is in prime child bearing ages, these areas also have both a high absolute number of births and a higher than the district average birth rate. Later, as family size increases, these families often move to single family homes--usually (relatively) moderately priced single family homes in other parts of the school district.

Middle School Enrollment (Grades 5-8)

The total middle school enrollment for the district is forecasted to drop from 798 in 2014-15 to 702 in 2019-20, a 96 student or 12.0% decrease. Between 2019-20 and 2024-25 middle school enrollment is forecasted to decline to 698, a decrease of 4 students or 0.5%. The difference in the size of the individual grade cohorts and the aging of students through the school system are the primary reasons why the middle school enrollment trends deviate from those of the elementary grades.

There are currently smaller grade cohorts enrolled in the elementary school grades compared to those in the middle schools' grade cohorts. As these elementary school cohorts "age" into middle school and larger middle school cohorts age into high school, they increase the overall middle school enrollment level. Note how the size of the incoming 5th grade class is usually smaller than the previous year's 8th grade class, which has now moved on to high school. As long as this "wave" in the enrollment pattern exists, there will be to some degree, an increase in middle school enrollment at least until the 2020-21 school years.

After the 2020-2021 school years, this cohort trend moderates. There will then be grade cohorts entering the middle school grades that are much closer in size compared to those leaving. The result is a stabilization of the middle school enrollment until 2024.

A secondary but equally important factor is the

number of "move up" homes being built in the district. These homes selling in excess of $417,000 tend to have children in the late elementary and middle school ages. Thus, the effect on enrollment from a new housing development with these types of homes would be first seen at grades five through eight. However, as the number of move up homes being constructed in the district declines over the next 10 years, the impact of in-migration will be reduced regarding year to year middle school enrollment trends.

High School Enrollment

Enrollment at the high school level is forecasted to grow from 971 in 2014-15 to 1,032 in 2019-20, an increase of 43 students or 4.3%. After 2019-20, the high school enrollment trend will reverse and begin to decline. The net result for the five-year period 2019-20 to 2024-25 will be a decrease of 80 students to 952 or 7.8%.

The aforementioned effects of changes in cohort size on middle school enrollment are also affecting the growth patterns of the high school population. The difference is that the bulk of the "dearth" cohort sizes will not begin to reach 9th grade until the 2019-20 school year. Over the next five years, the slightly larger sized grade cohorts that are in the middle school enrollment begin to enter high school. Until the larger sized cohorts of students pass through the high school grades, there will be growth in the enrollment at the district's high school, ending in 2019. After that point, high school enrollment will begin to rise.

It is important to note that the vast majority of this future high school enrollment growth will be a result of students aging into those grades. Specifically, students who already live in the district (and not in-migration of students ages 14 to 18) will be the primary cause of the forecasted increase in high school enrollment. Additionally, as was mentioned earlier, these forecasts represent the demographic changes that will affect high school enrollment. Any changes in the district's student transfer policy and/or changes in special high school level programs will need to be added or subtracted from the forecast result

High school enrollment is the most difficult of all the grade levels to project. The reason for this is the varying and constantly changing dropout rates, particularly in grades 10 and 11. For these forecasts the dropout rates at the high school were calculated for each grade over the last five years. These five-year averages were then held constant for the life of the forecast. The effects of any policy changes dealing with any school's dropout rates, program placement or reassignment of

former students to new grade levels will need to be added or subtracted from the forecast results.

REFERENCES

McKibben, J.
> The Impact of Policy Changes on Forecasting for
School Districts. <u>Population Research and Policy Review</u>, Vol. 15, No. 5-6, December 1996

McKibben, J., M. Gann, and K. Faust.
> The Baby Boomlet's Role in Future College
> Enrollment. <u>American Demographics</u>, June
> 1999.

Peters, G. and R. Larkin
> Population Geography. 7<u>th</u> Edition. Dubuque,
IA: Kendall Hunt Publishing. 2002.

Siegel, J. and D. Swanson
> <u>The Methods and Materials of Demography:</u>
> <u>Second Edition</u>, Academic Press: New York,
> New York. 2004.

Smith, S., J. Tayman and D. Swanson
> <u>State and Local Population Projections</u>,
> Academic Press, New York, New York. 2001.

Appendix A: Population Pyramids (Age/Sex)

Westwood, MA Total Population – 2010 Census

Males   Females
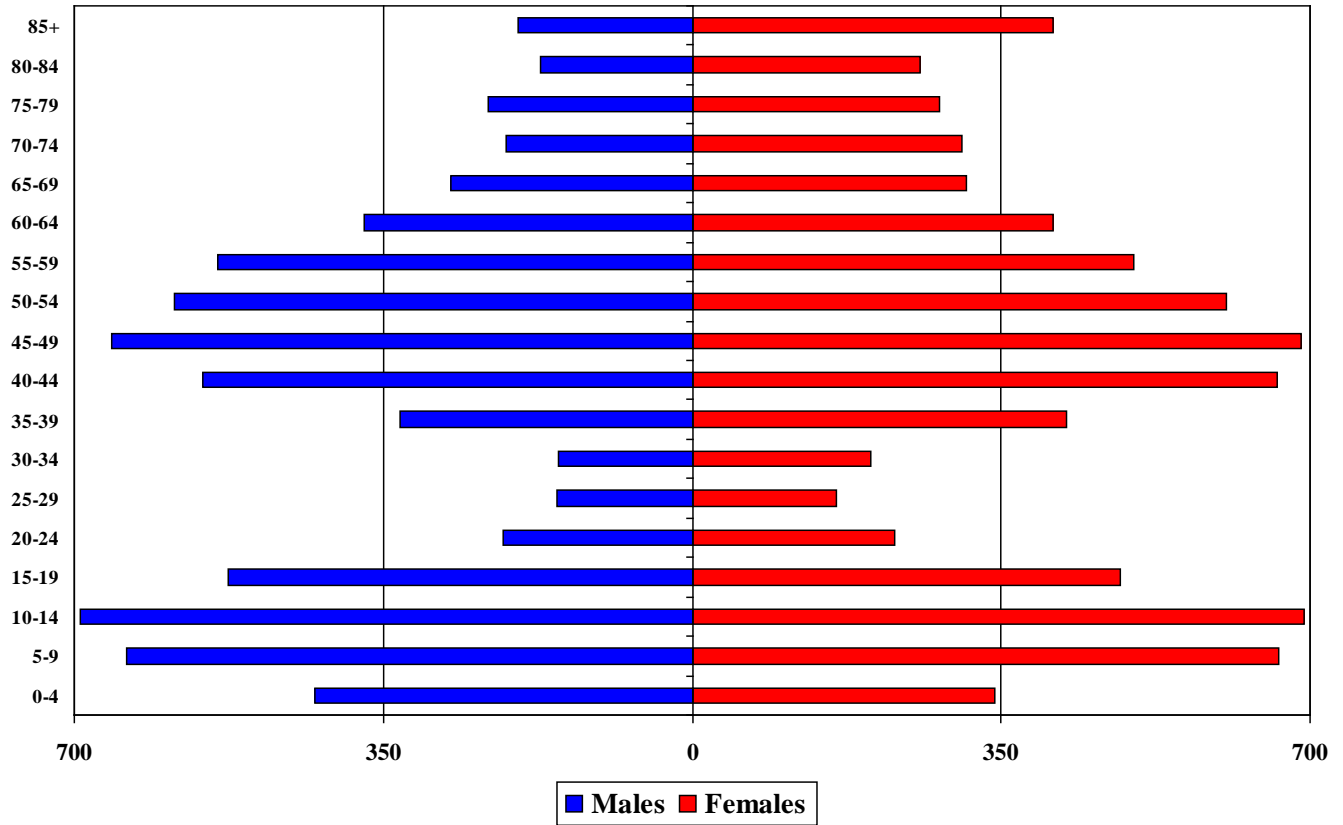
Deerfield School Total Population – 2010 Census
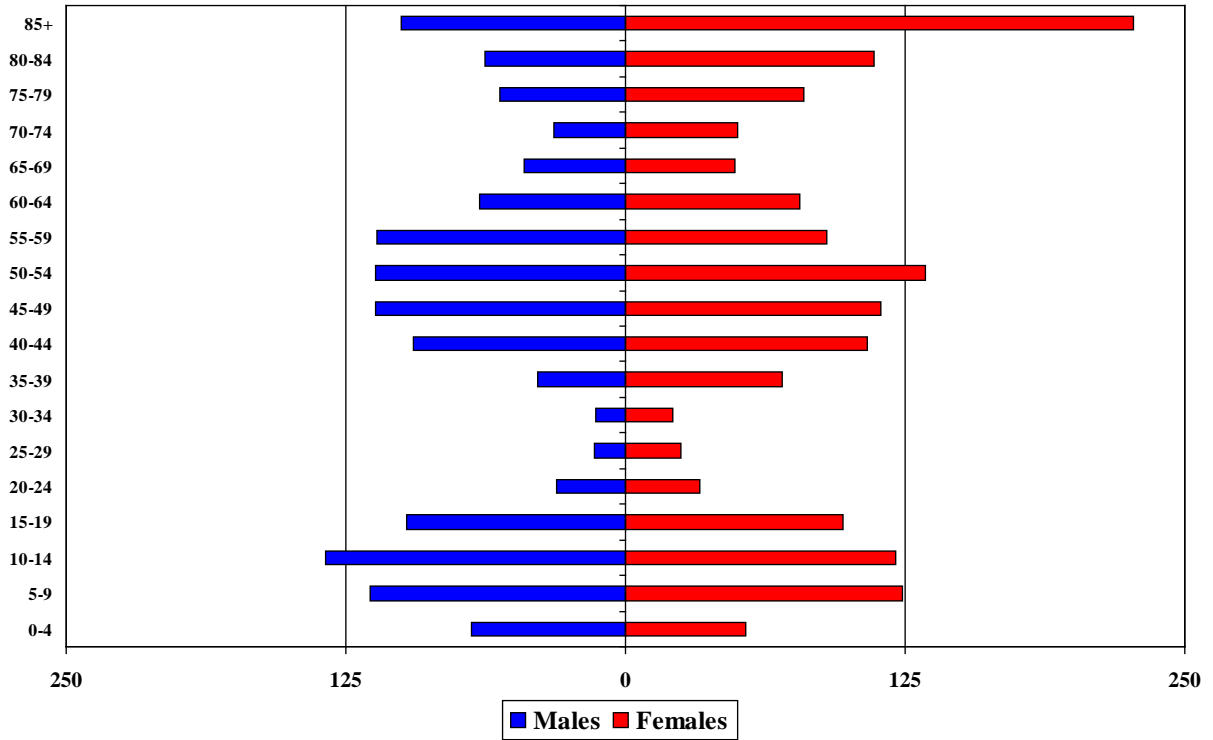
Downey School Total Population – 2010 Census
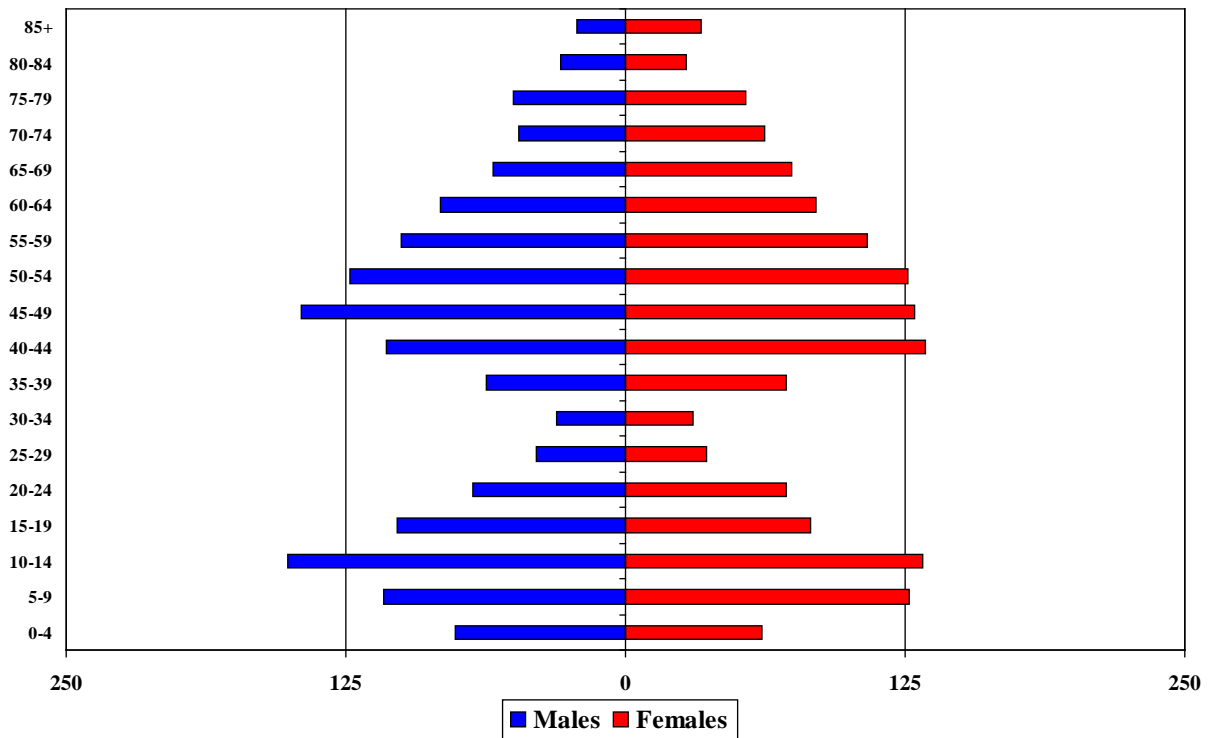
Paul Hanlon School Total Population – 2010 Census
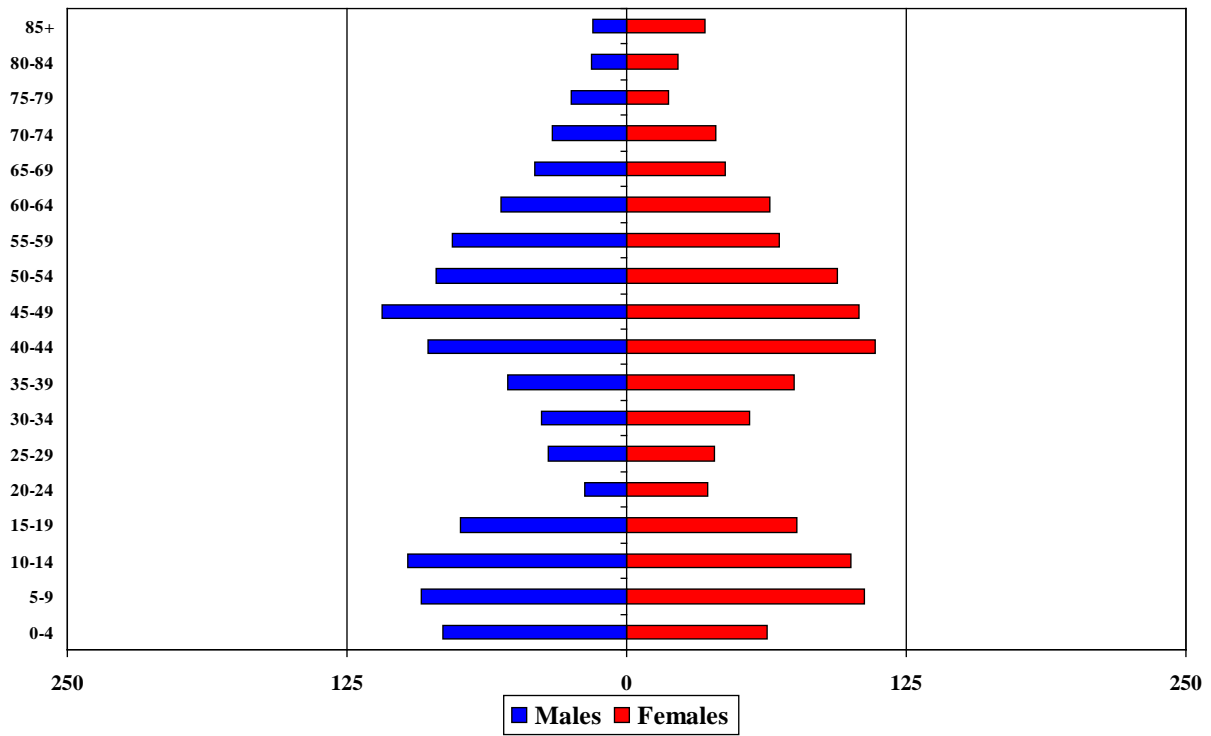
Martha Jones School Total Population – 2010 Census
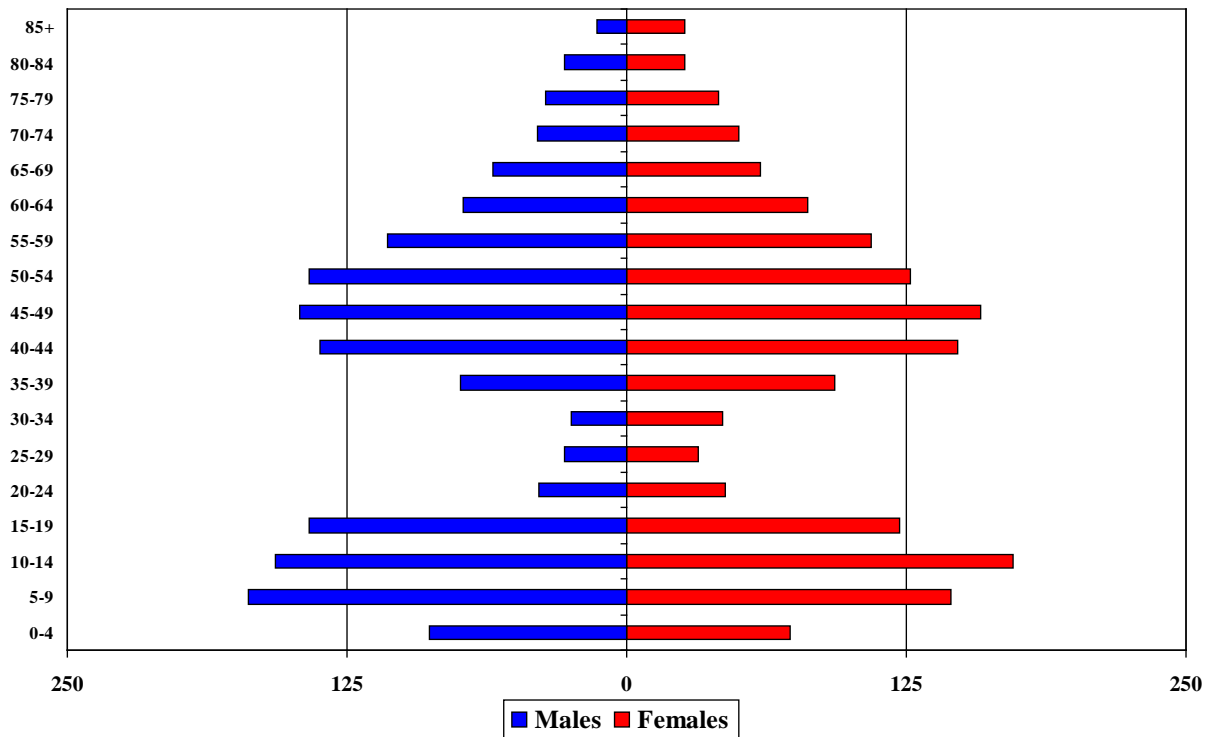
Sheehan School Total Population – 2010 Census
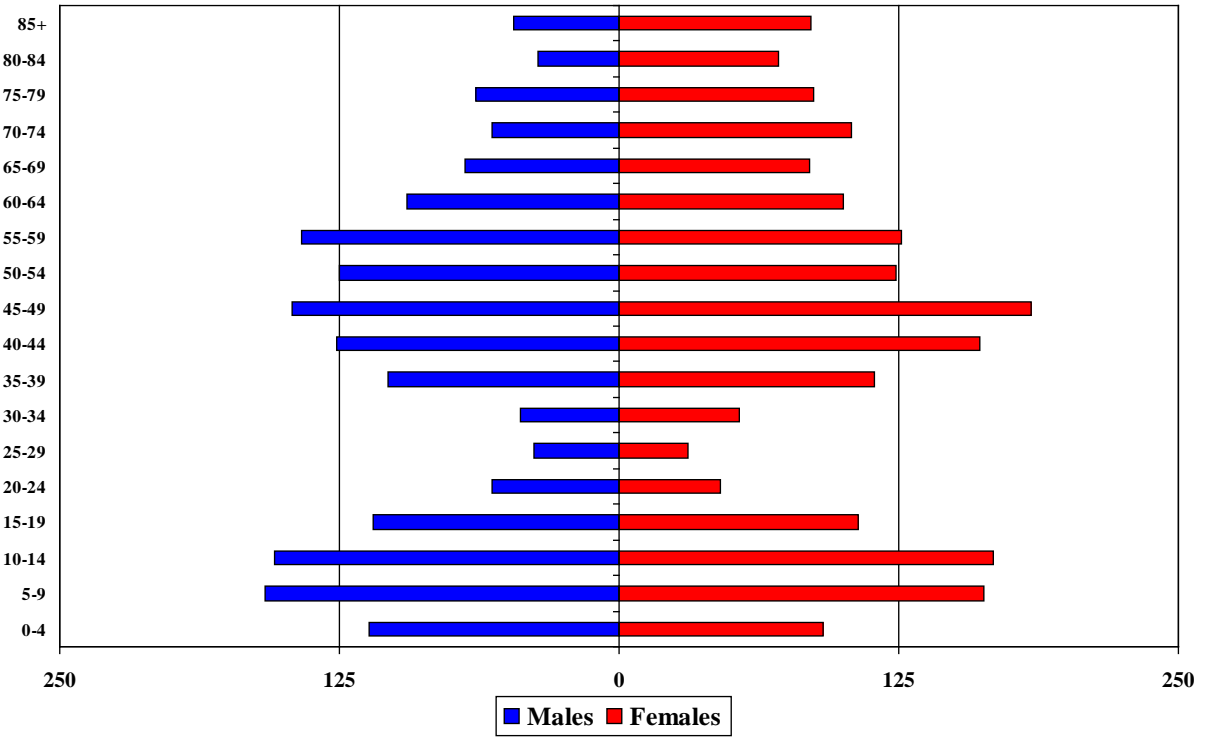
Appendix B: Enrollment Forecast Tables

Westwood Public Schools: Total District Enrollment

	2010-11	2011-12	2012-13	2013-14	2014-15	2015-16	2016-17	2017-18	2018-19	2019-20	2020-21	2021-22	2022-23	2023-24	2024-25
PK	49	46	47	47	47	47	47	47	47	47	47	47	47	47	47
K	217	225	184	211	206	207	201	195	189	185	186	184	180	178	181
1	243	226	235	207	213	220	218	212	206	200	196	194	192	188	186
2	268	250	230	249	209	218	224	222	216	210	207	203	201	199	195
3	232	274	253	240	252	211	220	225	223	217	215	212	207	205	202
4	255	243	274	264	248	257	217	224	231	228	226	224	221	216	214
5	260	268	244	273	263	250	259	217	226	233	232	230	228	225	220
Total: PK-5	1524	1532	1467	1491	1438	1410	1386	1342	1338	1320	1309	1294	1276	1258	1245
Change		8	-65	24	-53	-28	-24	-44	-4	-18	-11	-15	-18	-18	-13
%-Change		0.5%	-4.2%	1.6%	-3.6%	-1.9%	-1.7%	-3.2%	-0.3%	-1.3%	-0.8%	-1.1%	-1.4%	-1.4%	-1.0%
	2010-11	2011-12	2012-13	2013-14	2014-15	2015-16	2016-17	2017-18	2018-19	2019-20	2020-21	2021-22	2022-23	2023-24	2024-25
6	261	263	276	253	272	268	255	264	221	231	240	239	237	235	232
7	223	262	260	273	255	267	263	250	259	217	229	238	237	235	233
8	257	225	257	257	271	250	262	258	245	254	215	227	236	235	233
Total: 6-8	741	750	793	783	798	785	780	772	725	702	684	704	710	705	698
Change		9	43	-10	15	-13	-5	-8	-47	-23	-18	20	6	-5	-7
%-Change		1.2%	5.7%	-1.3%	1.9%	-1.6%	-0.6%	-1.0%	-6.1%	-3.2%	-2.6%	2.9%	0.9%	-0.7%	-1.0%
	2010-11	2011-12	2012-13	2013-14	2014-15	2015-16	2016-17	2017-18	2018-19	2019-20	2020-21	2021-22	2022-23	2023-24	2024-25
9	211	257	210	254	247	276	255	267	263	250	262	221	234	243	242
10	227	218	257	211	257	251	280	259	271	267	256	269	227	240	249
11	224	222	215	256	214	252	246	274	254	266	264	253	266	225	238
12	212	225	224	211	253	210	247	241	269	249	263	261	250	263	223
Total: 9-12	874	922	906	932	971	989	1028	1041	1057	1032	1045	1004	977	971	952
Change		48	-16	26	39	18	39	13	16	-25	13	-41	-27	-6	-19
%-Change		5.5%	-1.7%	2.9%	4.2%	1.9%	3.9%	1.3%	1.5%	-2.4%	1.3%	-3.9%	-2.7%	-0.6%	-2.0%
	2010-11	2011-12	2012-13	2013-14	2014-15	2015-16	2016-17	2017-18	2018-19	2019-20	2020-21	2021-22	2022-23	2023-24	2024-25
Total: PK-12	3139	3204	3166	3206	3207	3184	3194	3155	3120	3054	3038	3002	2963	2934	2895
Change		65	-38	40	1	-23	10	-39	-35	-66	-16	-36	-39	-29	-39
%-Change		2.1%	-1.2%	1.3%	0.0%	-0.7%	0.3%	-1.2%	-1.1%	-2.1%	-0.5%	-1.2%	-1.3%	-1.0%	-1.3%

Forecasts Developed November 2014

Green cells (2014-15 and earlier) are historical data

Blue cells (2015-16 and later) are forecasted years

Deerfield Elementary

	2010-11	2011-12	2012-13	2013-14	2014-15	2015-16	2016-17	2017-18	2018-19	2019-20	2020-21	2021-22	2022-23	2023-24	2024-25
K	39	37	41	28	41	37	36	35	34	33	35	36	36	36	36
1	42	41	38	47	30	38	39	38	37	36	35	36	37	37	38
2	43	44	41	44	46	31	39	40	39	38	37	36	37	38	38
3	36	45	42	40	45	45	30	38	39	38	37	36	35	36	37
4	46	40	45	49	41	47	47	31	40	41	40	39	38	37	38
5	45	50	36	46	44	40	46	46	30	39	40	39	38	37	36
Total K-5	251	257	243	254	247	238	237	228	219	225	224	222	221	221	223
Change		6	-14	11	-7	-9	-1	-9	-9	6	-1	-2	-1	0	2
% Change		2.4%	-5.4%	4.5%	-2.8%	-3.6%	-0.4%	-3.8%	-3.9%	2.7%	-0.4%	-0.9%	-0.5%	0.0%	0.9%

Forecasts Developed November 2014

Green cells (2014-15 and earlier) are historical data

Blue cells (2015-16 and later) are forecasted years

Downey Elementary

	2010-11	2011-12	2012-13	2013-14	2014-15	2015-16	2016-17	2017-18	2018-19	2019-20	2020-21	2021-22	2022-23	2023-24	2024-25
K	33	43	28	38	29	36	35	35	34	33	32	32	31	31	32
1	47	34	46	30	45	35	37	36	36	35	34	33	33	32	32
2	51	47	40	47	30	48	37	39	38	38	38	37	36	36	35
3	46	52	50	42	48	31	49	38	40	39	40	40	38	37	37
4	50	46	52	52	43	49	32	50	39	41	40	41	41	39	38
5	52	53	49	52	55	45	51	33	52	41	43	42	43	43	41
Total K-5	279	275	265	261	250	244	241	231	239	227	227	225	222	218	215
Change		-4	-10	-4	-11	-6	-3	-10	8	-12	0	-2	-3	-4	-3
% Change		-1.4%	-3.6%	-1.5%	-4.2%	-2.4%	-1.2%	-4.1%	3.5%	-5.0%	0.0%	-0.9%	-1.3%	-1.8%	-1.4%

Forecasts Developed November 2014

Green cells (2014-15 and earlier) are historical data

Blue cells (2015-16 and later) are forecasted years

Hanlon Elementary

	2010-11	2011-12	2012-13	2013-14	2014-15	2015-16	2016-17	2017-18	2018-19	2019-20	2020-21	2021-22	2022-23	2023-24	2024-25
K	35	36	23	47	36	40	39	38	37	37	37	36	35	34	35
1	36	36	39	23	39	40	42	41	40	39	39	38	37	36	35
2	43	37	35	45	22	37	38	40	39	38	38	38	37	36	35
3	39	41	36	38	46	21	36	36	38	37	37	37	37	36	35
4	37	41	40	38	43	47	22	37	37	39	39	39	39	39	38
5	36	37	41	40	40	44	48	22	38	38	41	41	41	41	41
Total K-5	226	228	214	231	226	229	225	214	229	228	231	229	226	222	219
Change		2	-14	17	-5	3	-4	-11	15	-1	3	-2	-3	-4	-3
% Change		0.9%	-6.1%	7.9%	-2.2%	1.3%	-1.7%	-4.9%	7.0%	-0.4%	1.3%	-0.9%	-1.3%	-1.8%	-1.4%

Forecasts Developed November 2014

Green cells (2014-15 and earlier) are historical data

Blue cells (2015-16 and later) are forecasted years

Martha Jones Elementary

	2010-11	2011-12	2012-13	2013-14	2014-15	2015-16	2016-17	2017-18	2018-19	2019-20	2020-21	2021-22	2022-23	2023-24	2024-25
K	49	52	38	46	38	43	42	40	39	38	38	37	36	36	36
1	49	50	54	41	48	43	45	44	42	41	40	40	39	38	37
2	62	51	49	55	44	50	45	47	46	44	43	42	42	41	40
3	61	64	54	55	55	46	52	47	49	48	47	46	45	45	43
4	69	64	63	53	56	54	45	51	46	48	49	48	47	46	46
5	69	68	65	60	54	55	53	44	50	45	49	50	49	48	47
Total K-5	359	349	323	310	295	291	282	273	272	264	266	263	258	254	249
Change		-10	-26	-13	-15	-4	-9	-9	-1	-8	2	-3	-5	-4	-5
% Change		-2.8%	-7.4%	-4.0%	-4.8%	-1.4%	-3.1%	-3.2%	-0.4%	-2.9%	0.8%	-1.1%	-1.9%	-1.6%	-2.0%

Forecasts Developed November 2014

Green cells (2014-15 and earlier) are historical data

Blue cells (2015-16 and later) are forecasted years

Sheehan Elementary

	2010-11	2011-12	2012-13	2013-14	2014-15	2015-16	2016-17	2017-18	2018-19	2019-20	2020-21	2021-22	2022-23	2023-24	2024-25
K	61	57	54	52	62	51	49	47	45	44	44	43	42	41	42
1	69	65	58	66	51	64	55	53	51	49	48	47	46	45	44
2	69	71	65	58	67	52	65	56	54	52	51	50	49	48	47
3	50	72	71	65	58	68	53	66	57	55	54	53	52	51	50
4	53	52	74	72	65	60	71	55	69	59	58	57	56	55	54
5	58	60	53	75	70	66	61	72	56	70	59	58	57	56	55
Total K-5	360	377	375	388	373	361	354	349	332	329	314	308	302	296	292
Change		17	-2	13	-15	-12	-7	-5	-17	-3	-15	-6	-6	-6	-4
% Change		4.7%	-0.5%	3.5%	-3.9%	-3.2%	-1.9%	-1.4%	-4.9%	-0.9%	-4.6%	-1.9%	-1.9%	-2.0%	-1.4%

Forecasts Developed November 2014

Green cells (2014-15 and earlier) are historical data

Blue cells (2015-16 and later) are forecasted years

Thurson Middle School

	2010-11	2011-12	2012-13	2013-14	2014-15	2015-16	2016-17	2017-18	2018-19	2019-20	2020-21	2021-22	2022-23	2023-24	2024-25
6	261	263	276	253	272	268	255	264	221	231	240	239	237	235	232
7	223	262	260	273	255	267	263	250	259	217	229	238	237	235	233
8	257	225	257	257	271	250	262	258	245	254	215	227	236	235	233
Total: 6-8	741	750	793	783	798	785	780	772	725	702	684	704	710	705	698
Change		9	43	-10	15	-13	-5	-8	-47	-23	-18	20	6	-5	-7
% Change		1.2%	5.7%	-1.3%	1.9%	-1.6%	-0.6%	-1.0%	-6.1%	-3.2%	-2.6%	2.9%	0.9%	-0.7%	-1.0%

Forecasts Developed November 2014

Green cells (2014-15 and earlier) are historical data

Blue cells (2015-16 and later) are forecasted years

Westwood High School

	2010-11	2011-12	2012-13	2013-14	2014-15	2015-16	2016-17	2017-18	2018-19	2019-20	2020-21	2021-22	2022-23	2023-24	2024-25
9	211	257	210	254	247	276	255	267	263	250	262	221	234	243	242
10	227	218	257	211	257	251	280	259	271	267	256	269	227	240	249
11	224	222	215	256	214	252	246	274	254	266	264	253	266	225	238
12	212	225	224	211	253	210	247	241	269	249	263	261	250	263	223
Total: 9-12	874	922	906	932	971	989	1028	1041	1057	1032	1045	1004	977	971	952
Change		48	-16	26	39	18	39	13	16	-25	13	-41	-27	-6	-19
% Change		5.5%	-1.7%	2.9%	4.2%	1.9%	3.9%	1.3%	1.5%	-2.4%	1.3%	-3.9%	-2.7%	-0.6%	-2.0%

Forecasts Developed November 2014

Green cells (2014-15 and earlier) are historical data

Blue cells (2015-16 and later) are forecasted years

Appendix C: Population Forecast Tables

Westwood Public Schools

Males	2010	2015	2020	2025
0-4	427	320	310	300
5-9	641	670	560	510
10-14	694	680	700	590
15-19	526	540	540	560
20-24	214	290	300	310
25-29	154	220	270	300
30-34	151	240	280	360
35-39	331	300	370	420
40-44	554	380	350	430
45-49	658	540	380	370
50-54	587	640	530	360
55-59	538	570	620	520
60-64	372	480	520	560
65-69	274	300	400	420
70-74	210	200	210	310
75-79	231	150	150	160
80-84	172	150	100	80
85+	197	170	140	110
Total	6,931	6,840	6,730	6,670

Females	2010	2015	2020	2025
0-4	342	310	300	280
5-9	664	590	560	510
10-14	693	690	620	580
15-19	485	530	560	480
20-24	230	240	310	330
25-29	163	220	240	310
30-34	203	230	310	320
35-39	424	360	390	430
40-44	662	470	410	450
45-49	689	660	470	420
50-54	605	680	650	460
55-59	501	580	660	630
60-64	408	470	560	630
65-69	311	340	400	490
70-74	306	260	290	350
75-79	281	250	220	240
80-84	258	210	200	150
85+	408	410	390	350
Total	7,633	7,500	7,540	7,410

Total	2010	2015	2020	2025
0-4	769	630	610	580
5-9	1,305	1,260	1,120	1,020
10-14	1,387	1,370	1,320	1,170
15-19	1,011	1,070	1,100	1,040
20-24	444	530	610	640
25-29	317	440	510	610
30-34	354	470	590	680
35-39	755	660	760	850
40-44	1,216	850	760	880
45-49	1,347	1,200	850	790
50-54	1,192	1,320	1,180	820
55-59	1,039	1,150	1,280	1,150
60-64	780	950	1,080	1,190
65-69	585	640	800	910
70-74	516	460	500	660
75-79	512	400	370	400
80-84	430	360	300	230
85+	605	580	530	460
Total	14,564	14,340	14,270	14,080
Median Age	43.9	44.4	43.4	42.6

	2010 to 2015	2015 to 2020	2020 to 2025
Births	450	450	450
Deaths	1,030	950	920
Natural Increase	-580	-500	-470
Net Migration	390	370	330
Change	-190	-130	-140

Differences between period Totals may not equal Change due to rounding.

Deerfield Elementary

Males	2010	2015	2020	2025
0-4	69	50	60	60
5-9	114	120	110	100
10-14	134	120	130	110
15-19	98	110	100	110
20-24	31	40	50	50
25-29	14	30	40	50
30-34	13	30	50	60
35-39	39	60	80	90
40-44	95	40	60	80
45-49	112	90	40	60
50-54	112	110	90	40
55-59	111	110	100	90
60-64	65	100	100	100
65-69	45	60	90	90
70-74	32	30	40	70
75-79	56	20	20	30
80-84	63	40	10	10
85+	100	80	50	30
Total	1,302	1,240	1,220	1,230

Females	2010	2015	2020	2025
0-4	54	50	50	50
5-9	124	110	110	100
10-14	121	130	120	110
15-19	97	90	110	90
20-24	33	40	40	60
25-29	25	30	40	40
30-34	21	40	50	60
35-39	70	70	90	90
40-44	108	70	70	90
45-49	114	110	70	60
50-54	134	110	110	70
55-59	90	130	110	100
60-64	78	90	130	100
65-69	49	70	80	120
70-74	50	40	60	70
75-79	80	40	30	50
80-84	111	60	30	20
85+	227	210	170	130
Total	1,584	1,490	1,470	1,410

Total	2010	2015	2020	2025
0-4	123	100	110	110
5-9	237	230	220	200
10-14	255	250	250	220
15-19	195	200	210	200
20-24	64	80	90	110
25-29	38	60	80	90
30-34	34	70	100	120
35-39	109	130	170	180
40-44	203	110	130	170
45-49	226	200	110	120
50-54	246	220	200	110
55-59	201	240	210	190
60-64	142	190	230	200
65-69	94	130	170	210
70-74	82	70	100	140
75-79	137	60	50	80
80-84	174	100	40	30
85+	327	290	220	160
Total	2,886	2,730	2,690	2,640
Median Age	49.1	48.4	44.4	42.6

	2010 to 2015	2015 to 2020	2020 to 2025
Births	90	90	90
Deaths	330	250	210
Natural Increase	-240	-160	-120
Net Migration	90	90	80
Change	-150	-70	-40

Differences between period Totals may not equal Change due to rounding.

Downey Elementary

Males	2010	2015	2020	2025
0-4	76	60	60	60
5-9	108	120	90	90
10-14	151	120	120	100
15-19	102	110	80	90
20-24	68	90	100	70
25-29	40	70	80	100
30-34	31	60	80	100
35-39	62	50	80	100
40-44	107	60	50	80
45-49	145	110	60	50
50-54	123	140	100	60
55-59	100	120	140	100
60-64	83	90	110	130
65-69	59	70	80	90
70-74	48	50	50	60
75-79	50	40	40	40
80-84	29	30	20	20
85+	22	20	20	20
Total	1,404	1,410	1,360	1,360

Females	2010	2015	2020	2025
0-4	61	60	60	50
5-9	127	100	90	90
10-14	133	130	110	100
15-19	83	90	100	80
20-24	72	70	80	90
25-29	36	70	70	80
30-34	30	50	90	80
35-39	72	50	70	100
40-44	134	70	50	80
45-49	129	130	70	50
50-54	126	130	130	70
55-59	108	120	120	130
60-64	85	100	120	120
65-69	74	70	90	100
70-74	62	70	60	80
75-79	54	50	60	50
80-84	27	40	40	40
85+	34	40	50	50
Total	1,447	1,440	1,460	1,440

Total	2010	2015	2020	2025
0-4	137	120	120	110
5-9	235	220	180	180
10-14	284	250	230	200
15-19	185	200	180	170
20-24	140	160	180	160
25-29	76	140	150	180
30-34	61	110	170	180
35-39	134	100	150	200
40-44	241	130	100	160
45-49	274	240	130	100
50-54	249	270	230	130
55-59	208	240	260	230
60-64	168	190	230	250
65-69	133	140	170	190
70-74	110	120	110	140
75-79	104	90	100	90
80-84	56	70	60	60
85+	56	60	70	70
Total	2,851	2,850	2,820	2,800
Median Age	43.6	44.8	42.5	40.6

	2010 to 2015	2015 to 2020	2020 to 2025
Births	90	100	100
Deaths	170	180	190
Natural Increase	-80	-80	-90
Net Migration	80	70	60
Change	0	-10	-30

Differences between period Totals may not equal Change due to rounding.

Hanlon Elementary

Males	2010	2015	2020	2025
0-4	82	70	60	60
5-9	92	120	100	90
10-14	98	100	120	110
15-19	74	80	80	110
20-24	19	30	30	40
25-29	35	20	30	30
30-34	38	60	40	50
35-39	53	40	60	50
40-44	89	70	60	70
45-49	109	90	70	60
50-54	85	110	90	60
55-59	78	80	100	80
60-64	56	70	80	90
65-69	41	40	60	60
70-74	33	30	30	40
75-79	25	20	20	20
80-84	16	20	20	10
85+	15	10	10	10
Total	1,038	1,060	1,060	1,040

Females	2010	2015	2020	2025
0-4	63	60	60	60
5-9	106	100	100	90
10-14	100	110	100	110
15-19	76	80	90	90
20-24	36	30	40	50
25-29	39	40	30	40
30-34	55	60	60	50
35-39	75	60	70	60
40-44	111	90	80	80
45-49	104	110	90	70
50-54	94	100	110	90
55-59	68	90	100	110
60-64	64	70	90	100
65-69	44	50	50	80
70-74	40	30	40	40
75-79	19	30	30	30
80-84	23	10	30	20
85+	35	40	30	30
Total	1,153	1,160	1,200	1,200

Total	2010	2015	2020	2025
0-4	145	130	120	120
5-9	198	220	200	180
10-14	198	210	220	220
15-19	150	160	170	200
20-24	55	60	70	90
25-29	74	60	60	70
30-34	93	120	100	100
35-39	128	100	130	110
40-44	200	160	140	150
45-49	213	200	160	130
50-54	179	210	200	150
55-59	146	170	200	190
60-64	121	140	170	190
65-69	85	90	110	140
70-74	74	60	70	80
75-79	44	50	50	50
80-84	39	30	50	30
85+	50	50	40	40
Total	2,191	2,220	2,260	2,240
Median Age	41.4	41.6	42.1	41.0

	2010 to 2015	2015 to 2020	2020 to 2025
Births	80	70	70
Deaths	120	120	120
Natural Increase	-40	-50	-50
Net Migration	70	70	60
Change	30	20	10

Differences between period Totals may not equal Change due to rounding.

Martha Jones Elementary

Males	2010	2015	2020	2025
0-4	88	60	60	60
5-9	169	140	120	110
10-14	157	170	150	120
15-19	142	130	150	120
20-24	39	70	60	80
25-29	28	40	70	60
30-34	25	40	50	80
35-39	74	50	60	70
40-44	137	100	70	90
45-49	146	130	100	80
50-54	142	140	130	90
55-59	107	140	140	130
60-64	73	100	130	130
65-69	60	60	80	110
70-74	40	40	40	60
75-79	36	30	30	30
80-84	28	20	20	20
85+	13	20	20	20
Total	1,503	1,480	1,480	1,460

Females	2010	2015	2020	2025
0-4	73	60	60	60
5-9	145	130	120	110
10-14	173	150	130	120
15-19	122	150	130	110
20-24	44	50	80	50
25-29	32	40	50	80
30-34	43	40	60	60
35-39	93	70	70	80
40-44	148	120	90	90
45-49	158	150	120	100
50-54	127	160	140	110
55-59	109	120	150	140
60-64	81	100	120	150
65-69	60	70	90	110
70-74	50	50	60	80
75-79	41	40	40	50
80-84	26	30	30	30
85+	26	30	40	40
Total	1,550	1,560	1,580	1,570

Total	2010	2015	2020	2025
0-4	161	120	120	120
5-9	313	270	240	220
10-14	330	320	280	240
15-19	264	280	280	230
20-24	83	120	140	130
25-29	60	80	120	140
30-34	68	80	110	140
35-39	167	120	130	150
40-44	285	220	160	180
45-49	304	280	220	180
50-54	269	300	270	200
55-59	216	260	290	270
60-64	154	200	250	280
65-69	120	130	170	220
70-74	90	90	100	140
75-79	77	70	70	80
80-84	54	50	50	50
85+	39	50	60	60
Total	3,052	3,040	3,060	3,030
Median Age	41.4	43.0	43.4	44.0

	2010 to 2015	2015 to 2020	2020 to 2025
Births	90	90	90
Deaths	150	160	170
Natural Increase	-60	-70	-80
Net Migration	60	60	60
Change	0	-10	-20

Differences between period Totals may not equal Change due to rounding.

Sheehan Elementary

Males	2010	2015	2020	2025
0-4	112	80	70	60
5-9	158	170	140	120
10-14	154	170	180	150
15-19	110	110	130	130
20-24	57	60	60	70
25-29	38	60	50	60
30-34	44	50	60	70
35-39	103	100	90	110
40-44	126	110	110	110
45-49	146	120	110	120
50-54	125	140	120	110
55-59	142	120	140	120
60-64	95	120	100	110
65-69	69	70	90	70
70-74	57	50	50	80
75-79	64	40	40	40
80-84	36	40	30	20
85+	47	40	40	30
Total	1,684	1,650	1,610	1,580

Females	2010	2015	2020	2025
0-4	91	80	70	60
5-9	163	150	140	120
10-14	167	170	160	140
15-19	107	120	130	110
20-24	45	50	70	80
25-29	31	40	50	70
30-34	54	40	50	70
35-39	114	110	90	100
40-44	161	120	120	110
45-49	184	160	120	140
50-54	124	180	160	120
55-59	126	120	180	150
60-64	100	110	100	160
65-69	85	80	90	80
70-74	104	70	70	80
75-79	87	90	60	60
80-84	71	70	70	40
85+	86	90	100	100
Total	1,900	1,850	1,830	1,790

Total	2010	2015	2020	2025
0-4	203	160	140	120
5-9	322	320	280	240
10-14	320	340	340	290
15-19	217	230	260	240
20-24	102	110	130	150
25-29	70	100	100	130
30-34	98	90	110	140
35-39	217	210	180	210
40-44	287	230	230	220
45-49	330	280	230	260
50-54	249	320	280	230
55-59	269	240	320	270
60-64	195	230	200	270
65-69	153	150	180	150
70-74	161	120	120	160
75-79	151	130	100	100
80-84	107	110	100	60
85+	133	130	140	130
Total	3,584	3,500	3,440	3,370
Median Age	44.2	44.1	43.9	43.8

	2010 to 2015	2015 to 2020	2020 to 2025
Births	100	100	100
Deaths	260	240	230
Natural Increase	-160	-140	-130
Net Migration	90	80	70
Change	-70	-60	-60

Differences between period Totals may not equal Change due to rounding.

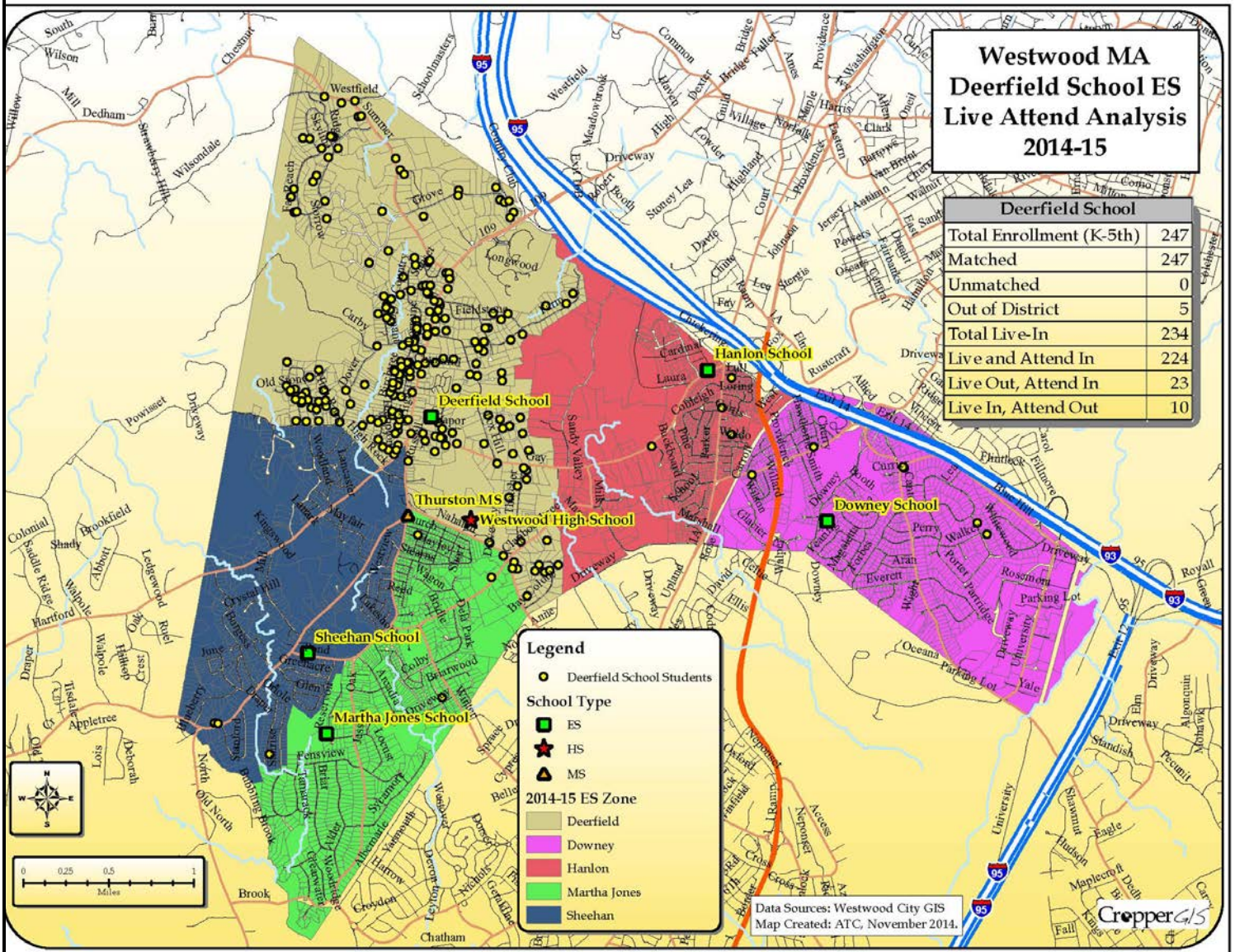**Appendix D: Live Attend Analysis**

This map series focuses on illustrating the geographic distribution of Westwood Public Schools' 2014-2015 students in relation to school attendance boundaries.

Here is an example of a map from this series.

Basic Map Elements

The legend explains how different features are represented, either by a point (e.g. schools and students), or by an area/polygon (e.g. attendance boundaries). The scale bar references the distance ratio of the map in relation to the real world.

Please note that each yellow dot represents a student's address, at which, multiple students could reside. Therefore, counting the number of dots shown on the map might not reflect the student population accurately.

Westwood MA
Deerfield School ES
Live Attend Analysis
2014-15

Deerfield School	
Total Enrollment (K-5th)	247
Matched	247
Unmatched	0
Out of District	5
Total Live-In	234
Live and Attend In	224
Live Out, Attend In	23
Live In, Attend Out	10

Live-Attend Tables

Each map has a table listing various statistics about the student data in this region. Here is a guide for reading this table:

Deerfield School	
Total Enrollment (K-5th)	247
Matched	247
Unmatched	0
Out of District	5
Total Live-In	234
Live and Attend In	224
Live Out, Attend In	23
Live In, Attend Out	10

Total Enrollment – number of students attending Deerfield ES.

Matched – number of students attending Deerfield ES whose addresses were located by the GIS, and placed on the map.

Unmatched - number of students whose addresses were not able to be located, and have not been placed on the map.

Out of District – number of students who live outside of the Westwood Public School boundaries, yet attend this school.

Total Live-In – number of students who live within the school's attendance boundary, who are in the K-5th grade cohort. The 'total-live in' statistic here indicates there are 234 K-5th grade students living within the Deerfield ES attendance boundary.

Live and Attend In – number of K-5th students who live within the attendance boundary, and also attend that school. In this example, 224 K-5th grade students who live within the Deerfield ES attendance boundary also attend Deerfield ES.

Live Out, Attend In – number of K-5th students who live outside of the Deerfield ES attendance boundary, but attend Deerfield ES. Any student records that are unmatched are not included in this count, since it is not known whether or not these unmatched students live within or outside the attendance boundary in question. Due to the methods used to calculate the statistics in this table, this is the only circumstance where this is relevant.

Live In, Attend Out – number of K-5th students who live inside the Deerfield ES attendance boundary, yet attend a different elementary school.

LIVE ATTEND MATRIX

The tables below give details on the schools that students attend and the school zones where they live. The schools of attendance are listed on the left while the zones where students live schools of attendance are listed on the top line. The first table includes all students in Kindergarten through Fifth Grade. The numbers highlighted in green are counts of students who attend the assigned schools for the zones where they live.

K-5th Matrix

Where Students Live

Where Students Attend		Total Live In (K-5th)	Deerfield	Downey	Hanlon	Martha Jones	Sheehan	Out of District	Live Out Attend In
Total Attending (K-5th)		234	235	225	287	369	41		
DEERFIELD SCHOOL	247	224	6	4	5	3	5	23	
DOWNEY SCHOOL	250	2	229	3	4	5	7	21	
PAUL HANLON SCHOOL	226	1		218			7	8	
MARTHA JONES SCHOOL	295	2			274	6	13	21	
WILLIAM E. SHEEHAN SCHOOL	373	5			4	355	9	18	
Live In Attend Out		10	6	7	13	14			

Westwood MA Deerfield School ES Live Attend Analysis 2014-15

Deerfield School	
Total Enrollment (K-5th)	247
Matched	247
Unmatched	0
Out of District	5
Total Live-In	234
Live and Attend In	224
Live Out, Attend In	23
Live In, Attend Out	10
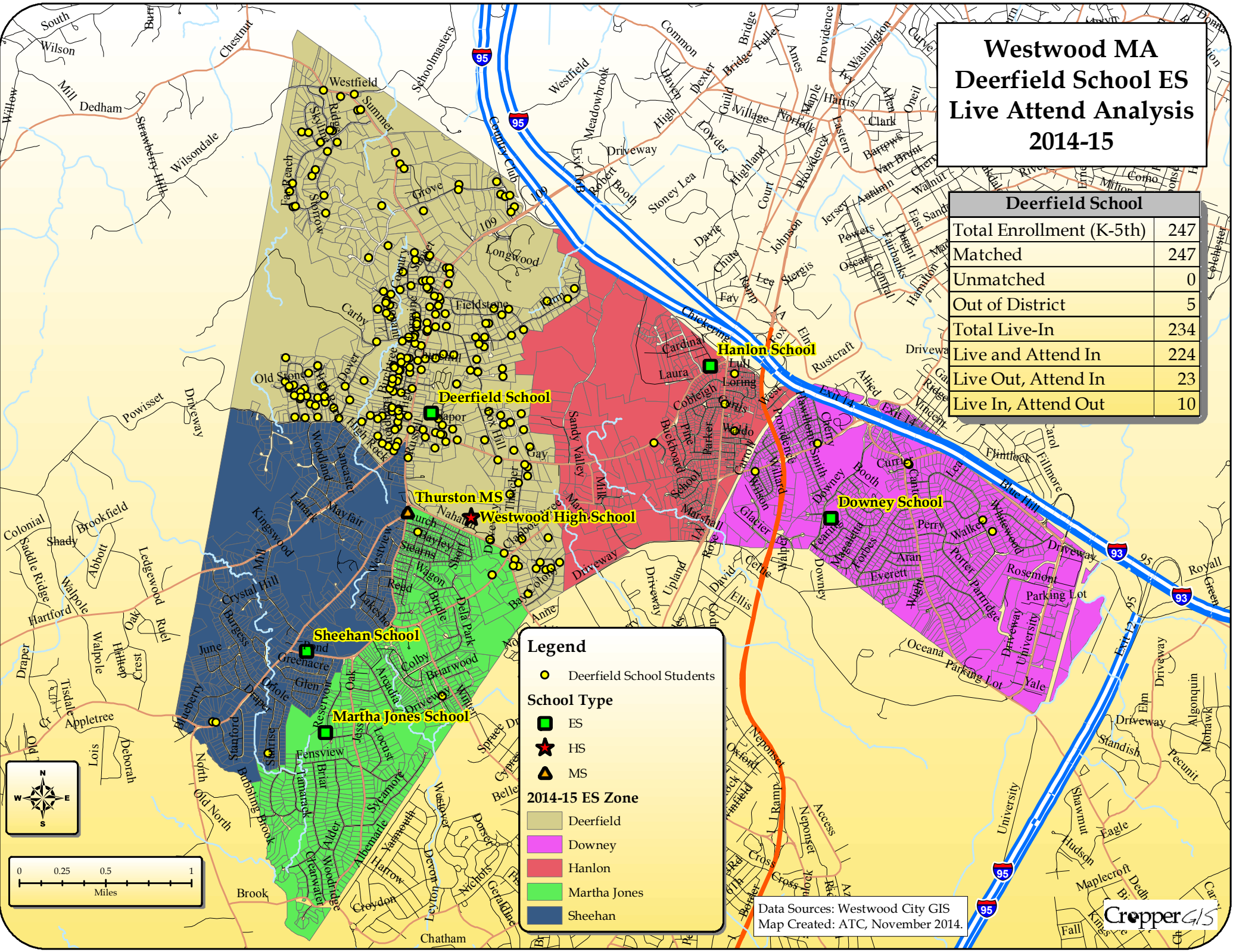
Legend

Deerfield School Students (●)

School Type

ES (■)

HS (★)

MS (▲)

2014-15 ES Zone

- Deerfield
- Downey
- Hanlon
- Martha Jones
- Sheehan

Hanlon School

Deerfield School

Thurston MS

Westwood High School

Downey School

Sheehan School

Martha Jones School

0 0.25 0.5 1
Miles

Cropper GIS

Westwood MA
Downey School ES
Live Attend Analysis
2014-15

Downey School	
Total Enrollment (K-5th)	250
Matched	250
Unmatched	0
Out of District	7
Total Live-In	235
Live and Attend In	229
Live Out, Attend In	21
Live In, Attend Out	6
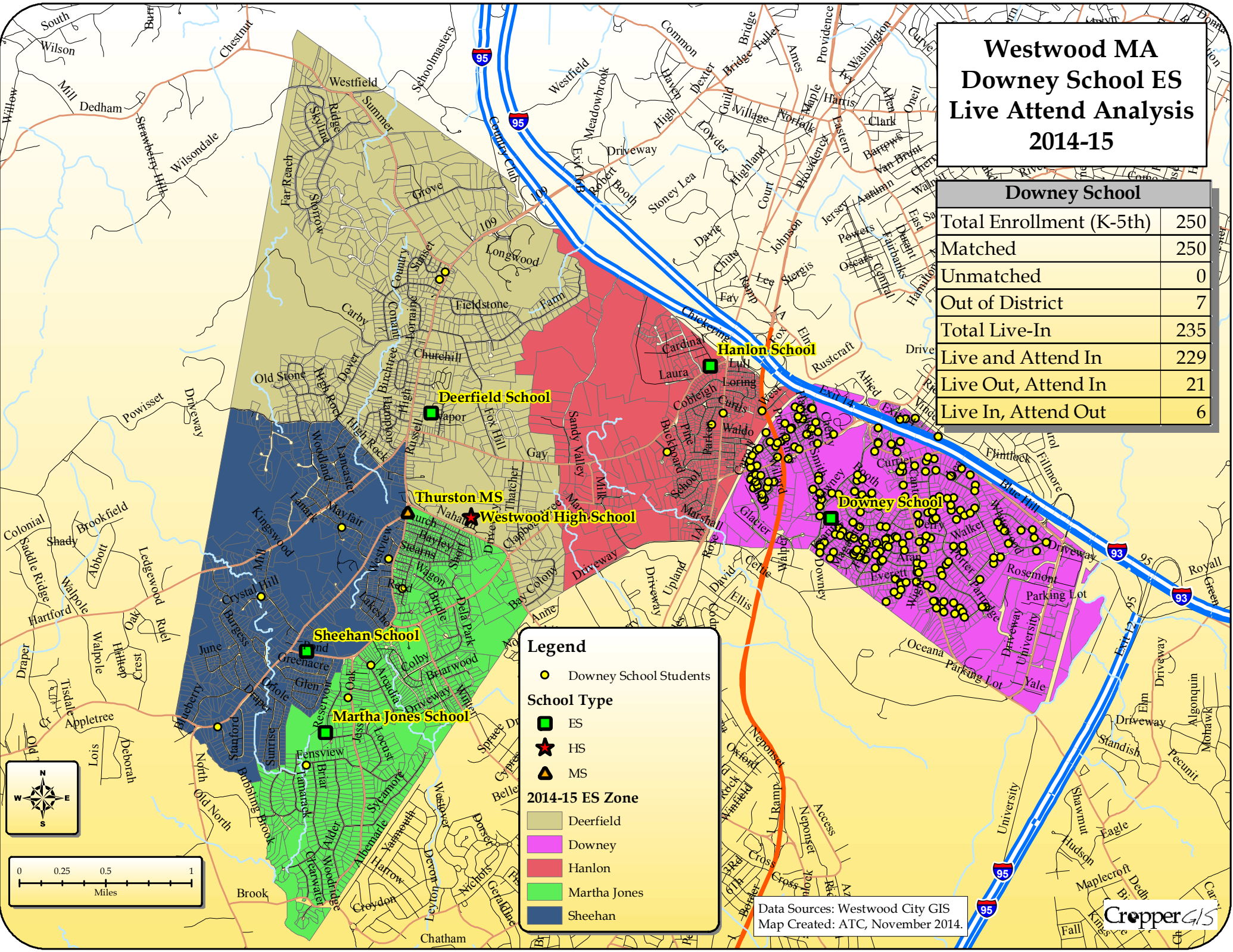
Legend

- ⬤ Downey School Students

School Type

- 🟩 ES
- ★ HS
- △ MS

2014-15 ES Zone
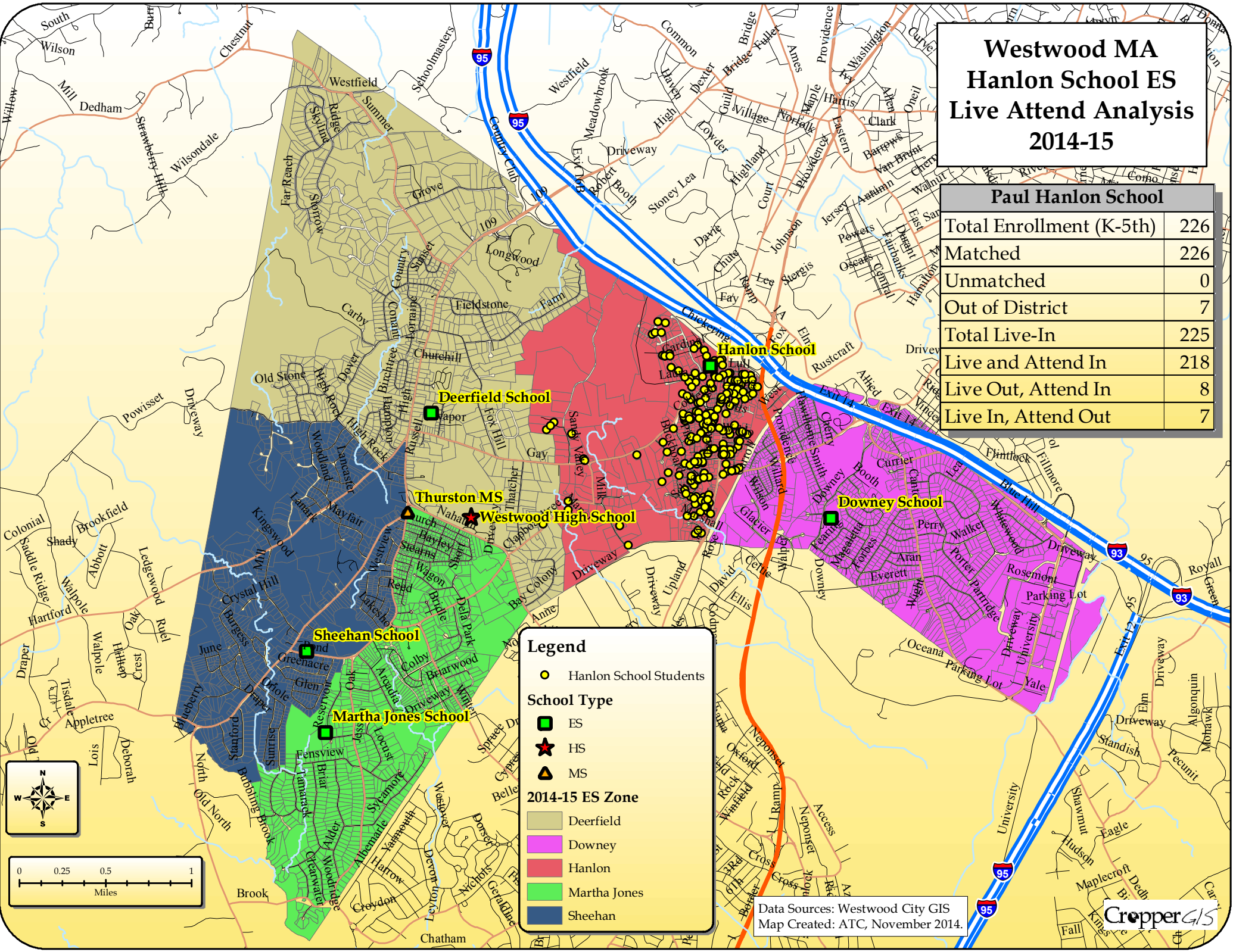
- Deerfield
- Downey
- Hanlon
- Martha Jones
- Sheehan

0   0.25   0.5   1
Miles

Data Sources: Westwood City GIS
Map Created: ATC, November 2014.

Cropper GIS
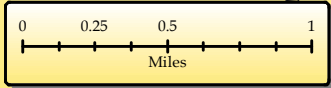
Westwood MA
Hanlon School ES
Live Attend Analysis
2014-15

Paul Hanlon School	
Total Enrollment (K-5th)	226
Matched	226
Unmatched	0
Out of District	7
Total Live-In	225
Live and Attend In	218
Live Out, Attend In	8
Live In, Attend Out	7

Hanlon School

Deerfield School

Thurston MS
Westwood High School

Downey School

Sheehan School

Martha Jones School

Legend

- ● Hanlon School Students

School Type
- ■ ES
- ★ HS
- ▲ MS

2014-15 ES Zone
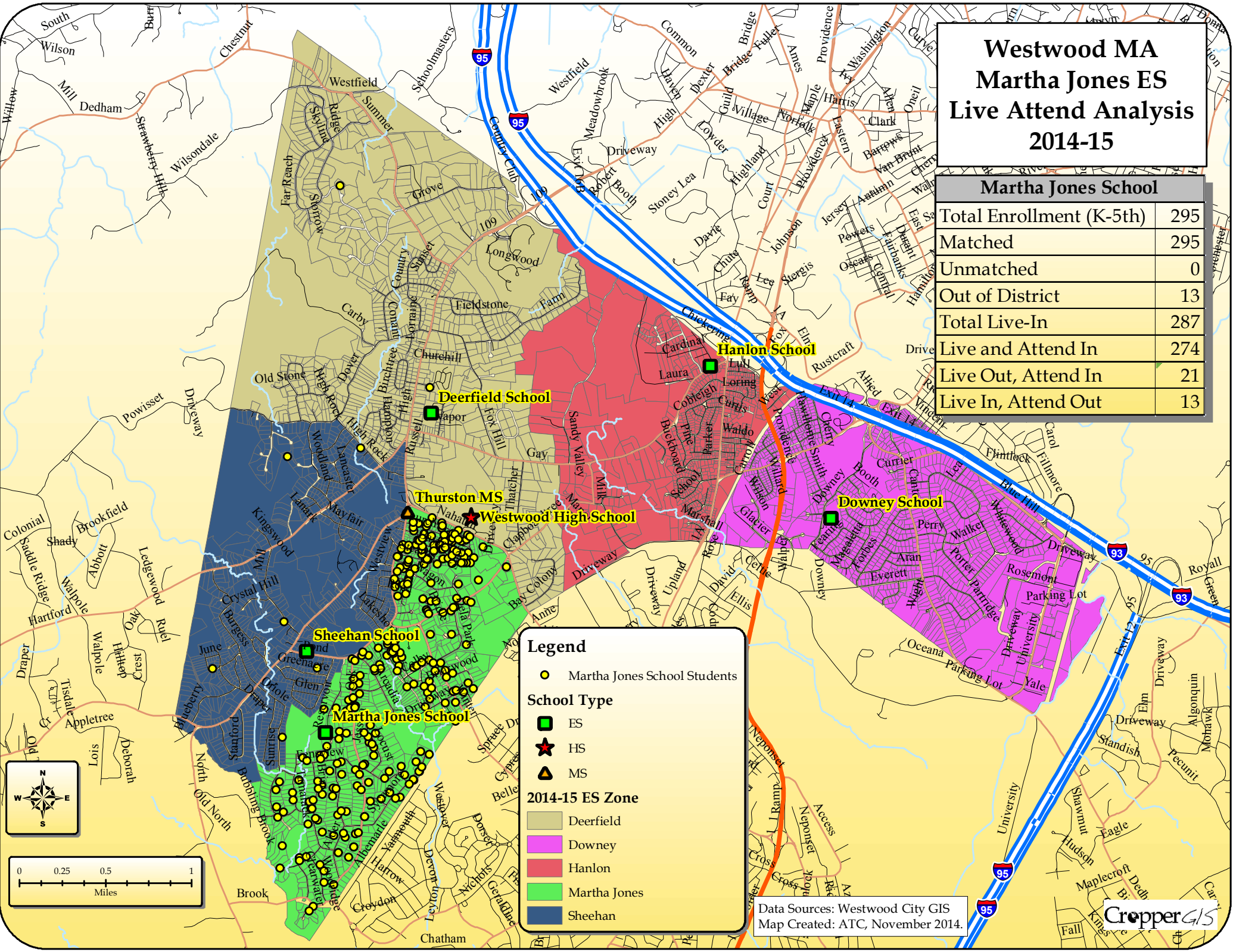- Deerfield
- Downey
- Hanlon
- Martha Jones
- Sheehan

0   0.25   0.5   1
Miles

Cropper GIS
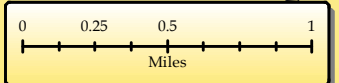
Westwood MA Martha Jones ES Live Attend Analysis 2014-15

Martha Jones School

Total Enrollment (K-5th)	295
Matched	295
Unmatched	0
Out of District	13
Total Live-In	287
Live and Attend In	274
Live Out, Attend In	21
Live In, Attend Out	13

Hanlon School

Deerfield School

Thurston MS

Westwood High School

Downey School

Sheehan School

Martha Jones School

Legend

● Martha Jones School Students

School Type

▣ ES

★ HS

△ MS

2014-15 ES Zone

■ Deerfield

■ Downey

■ Hanlon

■ Martha Jones

■ Sheehan

0   0.25   0.5   1
Miles

N W E S

Data Sources: Westwood City GIS
Map Created: ATC, November 2014.

Cropper GIS

Westwood MA
Sheehan ES
Live Attend Analysis
2014-15

William E. Sheehan School	
Total Enrollment (K-5th)	373
Matched	373
Unmatched	0
Out of District	9
Total Live-In	369
Live and Attend In	355
Live Out, Attend In	18
Live In, Attend Out	14

Hanlon School

Deerfield School

Thurston MS
Westwood High School

Downey School

Sheehan School

Martha Jones School
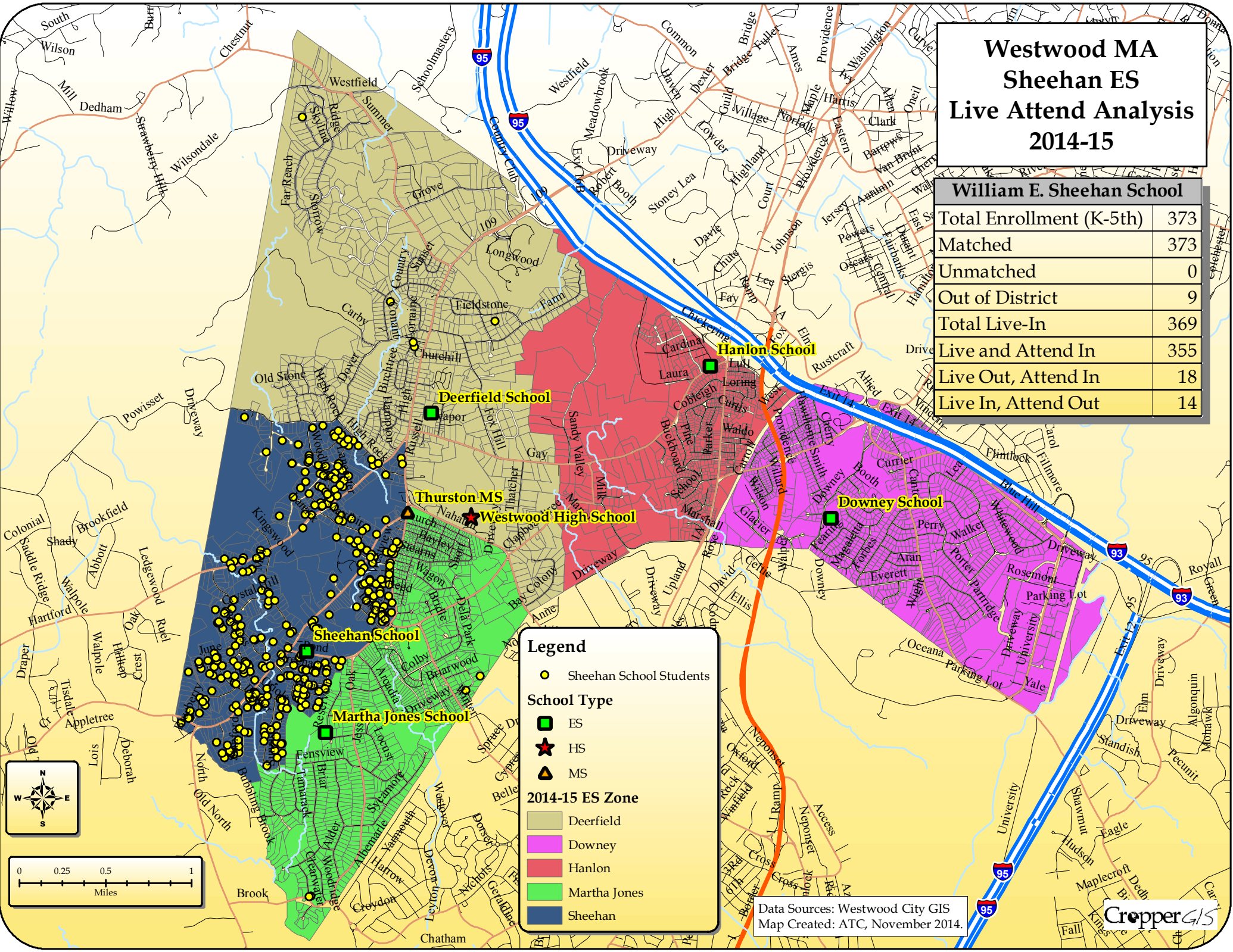
Legend

- ● Sheehan School Students

School Type

- ◼ ES
- ★ HS
- △ MS

2014-15 ES Zone

- Deerfield
- Downey
- Hanlon
- Martha Jones
- Sheehan

0   0.25   0.5   1
Miles

Cropper GIS