

# How DecisionInsite Determines Enrollment Projections at the District and School Level

## OVERVIEW

Enrollment projections are based on two critical factors: the student and school data supplied by the school district and the mathematical formulas that are applied to these data. Projections fundamentally look at recent history as reflected in the student data and assume that past patterns and trends will continue into the future. A range of unpredicted anomalies can cause reality to vary from the historical patterns. These include, but are not limited to, unusual changes in the economy, mortgage interest rates, the housing market, the job market, residential development plans, rental rates, etc.

DecisionInsite takes great care in preparing a district's enrollment projections. Known changes made by the district that interrupt the historical patterns, such as changes in attendance boundaries, or closing a school, can be accommodated in the projections. However, anomalous changes that occur between the last set of student data and the first projections are not reflected in the projections.

The calculations underlying the projections are mathematically precise. Each result is rounded to a whole number for ease of reading. This rounding may result in whole numbers displayed in a column not adding exactly to the displayed total of the column. This phenomenon, which is a result of rounding and not of any inaccuracy in the calculations, occurs both in the enrollment projections and in the community demographics.

Four major factors drive district-wide student enrollment projections. These include:

1. Recent kindergarten enrollment trends, modified by live birth data,
2. changes in the grade level cohorts of students served as it moves across the years,
3. changes in out of district enrollment
4. changes in the number of dwelling units within the district.

District-wide projections are disaggregated to school projections based on the historical patterns of:

- school draw rates, and
- school-to-school transfers.

## DISTRICT PROJECTIONS

These are the elements involved in determining district enrollment projections:

### Studyblocks

For demographic analysis and enrollment projections, the district is divided into studyblocks. Sometimes equivalent to an elementary attendance area or a census block group, a studyblock serves as the basis for the analysis of students served by the district and by schools. Studyblocks typically encompass 500–1000 students.

## **Kindergarten Enrollment**

The projected Kindergarten enrollment is a key variable in projecting K–12 enrollment. The base Kindergarten projection is determined by the trend of Kindergartners served in each studyblock in the previous 3 or 4 years. Depending on the circumstances, a growth trend in Kindergarten enrollment may be capped. Steep straight-line trends are mathematically moderated to avoid unrealistic results.

## **Live Births**

The base Kindergarten projection may be adjusted to reflect possible influence of live births. Where a trend of live births across recent years in a given zip code can be documented, the base Kindergarten projection for Studyblocks in that zip code is adjusted accordingly.

## **School Capacities**

School capacities provided by the district are compared to projected enrollments. A Special Day Class (SDC) student is calculated by default as requiring 1 seat. At district option, these defaults can be changed. For example, if SDC classes are formed at 10 and occupy a typical classroom space, the default could be set to 3 seats per SDC student.

## **Students in the Projections**

Enrollment projections are limited to typical K–12 students. SDC students are projected as a stable percentage of the typical population. Excluded from the projections are Pre-Kindergarten, Adult High School, Home School, Adult Ed, and Independent Study programs.

## **Attendance Boundaries**

Attendance boundaries are assumed to remain constant, unless otherwise noted by the district.

## **Closed Schools**

Opportunities for open enrollment (intradistrict) are assumed to remain unchanged, unless otherwise noted by the district.

## **Inter-district Enrollment**

Students enrolled from other school districts are treated in aggregate as a single or limited number of studyblocks. Kindergarten students, the low middle school grade, and the low high school grade from this studyblock(s) are projected to the extent they exist in the most recent year. Existing out of district students are aged through the grades. Draw rates are assumed to be constant.

## **Cohort Change of Students Served by the District**

Cohort percentage changes are calculated in order to assure sensitivity to perennial changes in students served by the district as they age from one grade level to the next. If every cohort were stable as it ages, the cohort percent change, from one grade to the next in each studyblock, would be calculated as 100%. For each studyblock, a cohort weighted average percent change over a defined number of years is calculated based on the change in the enrollment served as it ages from the previous grade level.

Average cohort percentages above 100% might, for example, reflect students returning from private schools. Cohort percentages below 100% might reflect drop-outs. Steep straight-line trends are mathematically moderated to avoid unrealistic results. Growth studyblocks are those showing unusually high increases in elementary grade enrollment and/or cohort percent change

in recent years—due, typically, to new housing development. Once growth studyblocks are identified, their default cohort percent change rate is set to “1” so as not to over-project new residential growth. By default, growth is not predicted to continue unless new occupied dwelling units are projected. Exceptions to the default are made at grade 1, the low middle school grade, the low high school grade, and grade 12.

Cohort changes can be adjusted as necessary. Manipulation of cohort percentages is used, for example, to reflect changes in inter-district transfers due to policy changes in sending or receiving districts.

### **Residential Development Impact**

The predicted impact of residential development on district enrollment is based on three factors: 1) proposed new dwelling units, 2) the student generation rate for each unit type, and 3) the grade level distribution of newly generated students.

#### **1. Dwelling Units**

New dwelling units are categorized into three housing types: Single Family Detached, Single Family Attached, and Multifamily. Developers and builders are contacted for information relative to their annual plans for occupancy of new dwelling units. The conservative projection adjusts the developer stated phasing by stretching the units in a given project across more years.

#### **2. Student Generation**

Student generation rates are determined for each product type for each level: elementary, middle school and high school. These generation rates can also be varied by year or by project. Student generation rates are based on similar products types where such exist; otherwise, a default generation rate is used.

#### **3. Grade Level Distribution**

For each level, students generated by new dwelling units are distributed across grade levels. These percentages are based on historical patterns where they exist; otherwise, default percentages are used.

## **SCHOOL PROJECTIONS**

These are the elements involved in distributing across the schools the students projected in the district enrollment:

### **School Draw Rates**

Projecting enrollment at the school level is based on the concept of a school draw rate, i.e., the percent of students from a given studyblock who enroll in a given school at its lowest grade. Draw rates reflect the impact of open enrollment within a district. For example, if one-half the sixth-graders from a given studyblock enroll in a particular 6–8 middle school, that school has a draw rate of 50% from that studyblock.

The draw rate for the most recent year is applied by default to the projected district enrollment for that grade from a given studyblock. The draw rate ages with the cohort. In this way, if the underlying cohort changes, the number of students enrolled at the school will change accordingly.

Draw rates can be adjusted as necessary. Manipulation of draw rates is used, for example, to project the impact of changes in attendance boundaries, the impact of closing a school to open enrollment, or opening a new school.

### **Intra-district Transfers**

Grade-level transfers within or across schools are included in the projections to accommodate fluctuations like retention, transfer to continuation school, or any other special programs a district may offer that result in students changing schools at other than the typical grade configuration shifts. Transfers are calculated by applying the percent of a grade level population at one school that is transferred in the following year to another school, or continued at the same grade level at a given school in the following year.

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## Enrollment Projections Process Summary

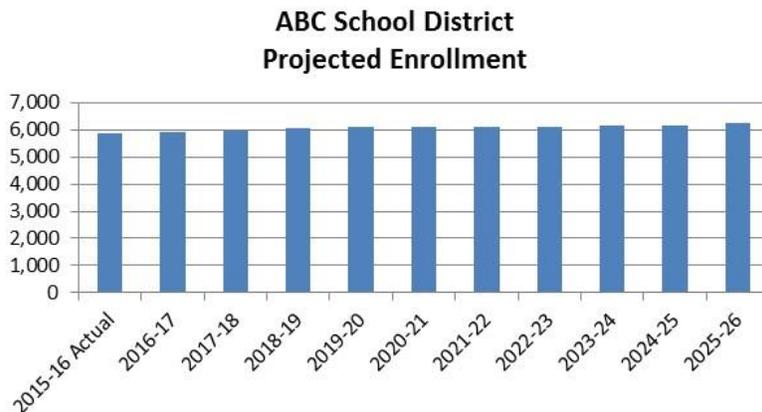
**FutureThink** will collect, review, and analyze demographic data from Wellesley Public Schools; county, town, and township agencies; the State of Massachusetts; and the US Census. The following information will be collected to develop the enrollment projections:

- ▶ Last 10 years of enrollment for the Wellesley Public Schools, by grade, by school
- ▶ Private school enrollment
- ▶ Birth data
- ▶ Population trends
- ▶ Economic trends
- ▶ Building permits
- ▶ Housing development/turnover
- ▶ Subdivision activity
- ▶ Previous enrollment studies
- ▶ Any additional pertinent information

**FutureThink** will utilize and assess the information listed above to develop the following:

- ▶ Historical enrollment trend analysis and grade-to-grade survival ratios
- ▶ Demographic profile of the Town and District
- ▶ Population estimates and projections by census block group to identify changes within the District regarding growth, age, and wealth
- ▶ Housing profile of the District, including rapidity of change in home development, current and future housing development plans, and areas of potential development
- ▶ 10-year projected enrollment by grade, by school (high, moderate, and low projections)

The final report will be submitted electronically. Presentations will be made to Town committees as needed.



## **McKibben Demographic Research, Population and Enrollment Forecast Methodology**

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

- A base-year population, here the population of each attendance area.
- A set of age-specific fertility, mortality and migration rates for each attendance area to be used over the forecast period;
- Historical enrollment figures by grade.

The data used for the forecasts come from a variety of sources.

Enrollments by grade and attendance area are provided by the school district for school years 2010-2011 to 2015-2016. Birth and death data were obtained from the State Department of Health for the years 2010 through 2014. The net migration values were calculated using Internal Revenue Service migration reports for the years 2010 through 2013. The base age-sex population counts used are from the results of the 2010 Census. Other locally obtained variable that will be used in the construction of the population forecast models include but are not limited to: age structure of the population, sales of existing and new housing units, housing price, housing tenure, household size and composition and planned infrastructure improvements.

The population forecasts are calculated using a cohort-component methodology 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 are

constructed to specifically reflect the demographic characteristics of each of the attendance area. The forecasts assume that a specific set of economic, political, social, and demographic factors will occur in the through the year 2025. These assumptions are used in the generation of the population forecasts in which the school age population (and subsequent enrollment forecast) is embedded.

The enrollment forecasts are calculated using a modified average survivorship method. Average survivor rates over the previous five years of year-to-year enrollment data are calculated for grades two through twelve. The survivorship rates are then modified, or adjusted, to reflect the average rate of forecasted in or out- migration of 5-to-9 and 10-to-14 year olds as well as the parental households to each of the attendance centers for the period 2010 to 2015. These survivorship rates then are adjusted to reflect the forecasted changes in age-specific migration the district should experience over the next five years. These modified survivorship rates are used to project the enrollment of grades 2 through 12 for the periods 2016-2020 and 2021-2025.

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 area. 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. The level of the accuracy for both the population and enrollment forecasts at the school district level is estimated to be ±2.0% for the life of the forecasts.



*New England School Development Council*

*Celebrating over sixty-five years of service to education*

March 18, 2016

Wellesley Public Schools

Attn: Ms. Judith M. Belliveau, Assistant Superintendent for Finance and Operations

40 Kingsbury Street

Wellesley, MA 02481

Dear Ms. Belliveau:

It was a pleasure speaking with on March 16. We thank you for informing NESDEC of your district's intention to solicit bids for a firm to conduct a demographic study so that it might be compared with another demographic study that would be conducted by another previous vendor. While the approach you describe sounds interesting, I doubt that NESDEC would submit a proposal to conduct a demographic study under such an arrangement.

However, I would point out that nearly 300 school districts from all over New England receive annual enrollment projections as part of their affiliation with NESDEC. If Wellesley Public Schools were to become a NESDEC affiliate, the district would be eligible for enrollment projections and an accompanying Letter of Analysis at no additional charge. The letter explains factors that may be impacting enrollments as well as other variables that could influence future enrollments. As an affiliate, the district would also be entitled to an annual Special Education Trend Report at no additional cost, as well as a 20% discount on our broad range of planning and management services.

A public school system in New England may become an affiliate of NESDEC for an annual fee based upon student enrollment. Our Initial Year Incentive (IYI) program permits a school district to affiliate at one-half the cost of affiliation in the first year; at 75% of the cost in year two; and full cost in year three. Under the IYI program, the cost of affiliation for Wellesley in the first year, based upon an enrollment of 5,086 students, would be \$2,428 (50% of the full fee of \$4,855).

Please review the enclosed materials and let us know if you think Wellesley might be interested in becoming a NESDEC affiliate. For your convenience, an application is included. If you were to affiliate by May 30, 2016, not only would your district be eligible to receive a set of enrollment projections prepared this spring or summer based upon October 2015 data, you would also be eligible to receive a complete set of updated enrollment projections in the fall based upon October 2016 data.

As always, if you have questions or if we can be of further assistance, please feel free to call. Either I or one of our knowledgeable consultants would be happy to help you.

Very truly yours,

Arthur L. Bettencourt, Ed.D.

Executive Director

Enclosure

# ENROLLMENT PROJECTION REPORT (excerpt)



## Anytown, New England Projected Enrollment

School District: Anytown, New England

10/17/2015

Enrollment Projections By Grade*																				
Birth Year	Births		School Year	PK	K	1	2	3	4	5	6	7	8	9	10	11	12	UNGR	K-12	PK-12
2010	266		2015-16	109	194	238	237	204	210	204	230	233	217	165	180	184	171	0	2667	2776
2011	263		2016-17	110	204	207	238	237	206	206	206	223	231	181	163	181	185	0	2668	2778
2012	259		2017-18	111	201	217	207	238	240	202	208	200	221	193	179	164	182	0	2652	2763
2013	256		2018-19	112	199	214	217	207	241	236	204	202	198	185	191	180	165	0	2639	2751
2014	265	(est.)	2019-20	113	210	212	214	217	209	237	238	198	200	165	183	192	181	0	2656	2769
2015	262	(est.)	2020-21	114	204	224	212	214	219	205	239	231	196	167	163	184	193	0	2651	2765
2016	261	(est.)	2021-22	115	204	217	224	212	216	215	207	232	229	164	165	164	185	0	2634	2749
2017	260	(est.)	2022-23	116	204	217	217	224	214	212	217	201	230	191	162	166	165	0	2620	2736
2018	261	(est.)	2023-24	117	204	217	217	217	227	210	214	210	199	192	189	163	167	0	2626	2743
2019	262	(est.)	2024-25	118	205	217	217	217	219	223	212	207	208	166	190	190	164	0	2635	2753
2020	261	(est.)	2025-26	119	204	218	217	217	219	215	225	206	205	174	164	191	191	0	2646	2765

\*Projections should be updated on an annual basis.

Based on an estimate of births

Based on children already born

Based on students already enrolled

### Grade combinations as requested by the District

Projected Enrollment in Grade Combinations*									
Year	PK-K	K-5	1-5	K-8	5-8	6-8	7-8	7-12	9-12
2015-16	303	1287	1093	1967	884	680	450	1150	700
2016-17	314	1298	1094	1958	866	660	454	1164	710
2017-18	312	1305	1104	1934	831	629	421	1139	718
2018-19	311	1314	1115	1918	840	604	400	1121	721
2019-20	323	1299	1089	1935	873	636	398	1119	721
2020-21	318	1278	1074	1944	871	666	427	1134	707
2021-22	319	1288	1084	1956	883	668	461	1139	678
2022-23	320	1288	1084	1936	860	648	431	1115	684
2023-24	321	1292	1088	1915	833	623	409	1120	711
2024-25	323	1298	1093	1925	850	627	415	1125	710
2025-26	323	1290	1086	1926	851	636	411	1131	720

See "Reliability of Enrollment Projections" section of accompanying letter.  
Projections are more reliable for Years #1-5 in the future than for Years #6 and beyond.

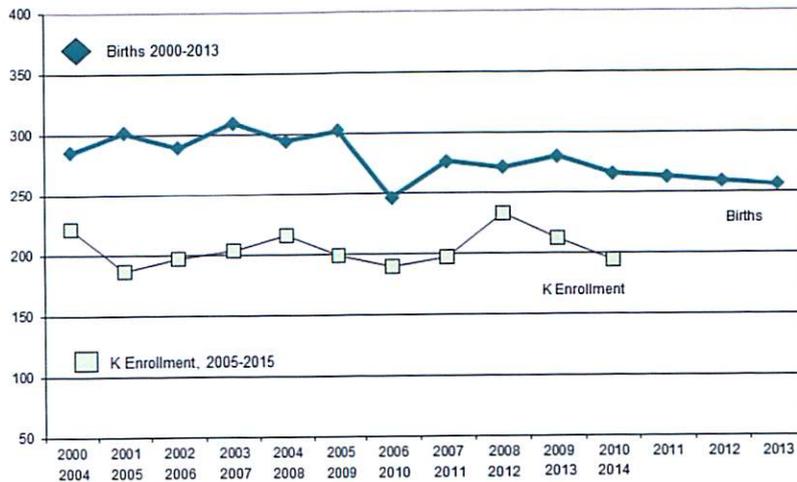
Projected Percentage Changes			
Year	K-12	Diff.	%
2015-16	2667	0	0.0%
2016-17	2668	1	0.0%
2017-18	2652	-16	-0.6%
2018-19	2639	-13	-0.5%
2019-20	2656	17	0.6%
2020-21	2651	-5	-0.2%
2021-22	2634	-17	-0.6%
2022-23	2620	-14	-0.5%
2023-24	2626	6	0.2%
2024-25	2635	9	0.3%
2025-26	2646	11	0.4%
Change		-21	-0.8%

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- REPORT E-MAILED TO SUPERINTENDENT
- LETTER OF ANALYSIS
- GRADE COMBINATIONS AS REQUIRED BY DISTRICT
- 13 PDF PAGES IN FULL REPORT

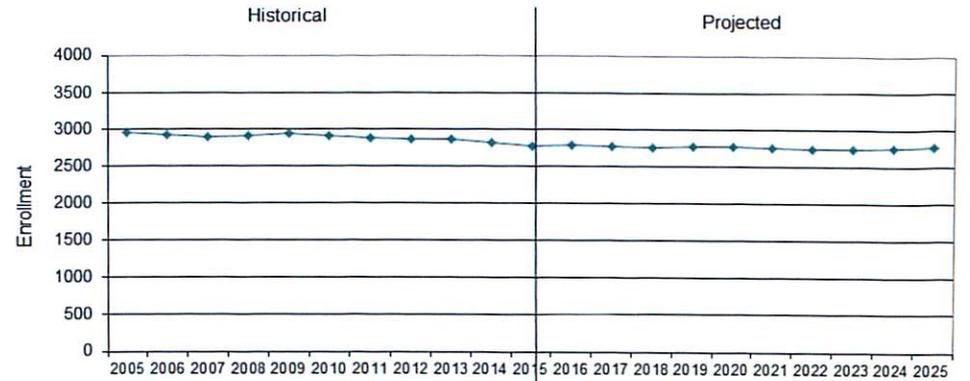
FOR COMPREHENSIVE DEMOGRAPHIC REPORT, PLEASE REQUEST A PROPOSAL. SEE ALSO: [www.nesdec.org](http://www.nesdec.org)

## Anytown, New England Birth-to-Kindergarten Relationship



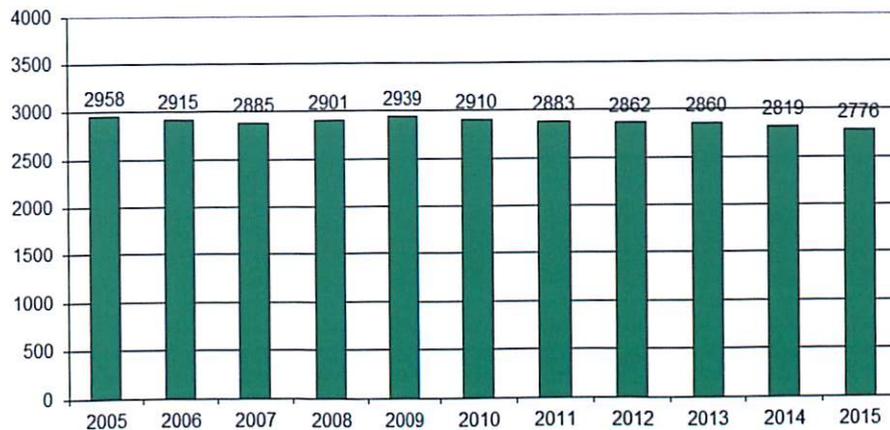
## Anytown, New England Historical & Projected Enrollment

PK-12, 2005-2025



## Anytown, New England Historical Enrollment

PK-12, 2005-2015



## Anytown, New England Additional Data

Year	Single-Family	Multi-Units
2005	16	6
2011	6	0
2012	17	0
2013	13	68
2014	23	27
2015	11 to Sep 30	0

Source: HUD and Building Department

Year	Voc-Tech 9-12 Total	Non-Public K-12 Total
2005-06	62	606
2011-12	71	589
2012-13	73	507
2013-14	85	541
2014-15	103	556
2015-16	110	n/a

Open Districts will not know this information until later; thus data from the prior year can be utilized

Enrollments Oct. 1, 2014	K	1	2	3	4	5	6	7	8	9	10	11	12	K-12 TOTAL
	30	26	28	25	30	40	29	54	58	64	64	54	54	556

2015	23
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2015	43
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2015	55
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2015	4
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The above data were used to assist in the preparation of the enrollment projections. If additional demographic work is needed, please contact our office.