

Updated Housing Analysis and Enrollment Projections

August 2019

2018 Projections

- Projections prepared in spring 2018
 - Based on 2017-18 enrollment data
 - Straight cohort-survival, computational update, no analysis of housing trends performed at that time
- Overall, performed well for elementary, middle and high school in 2018-19; however, K and 9th grades were low
- Preliminary 2019-20 enrollment running higher than projected at elementary level, especially with K running 15% higher than projected
- Projection revisions required

School Year	Dataset	K	1	2	3	4	5	6	7	8	9	10	11	12	K-5	6-8	9-12
2018-19	Projection	144	158	174	180	172	193	217	245	209	221	231	214	215	1,020	672	880
	Actual Enrollment	153	157	178	182	171	184	213	244	213	234	229	208	209	1,025	670	880
	Difference	9	-1	4	2	-1	-9	-4	-1	4	13	-2	-6	-6	5	-2	0
		5.9%	-0.4%	2.3%	1.3%	-0.5%	-5.0%	-2.1%	-0.3%	1.7%	5.5%	-0.7%	-2.7%	-2.9%	0.5%	-0.2%	0.0%

School Year	Dataset	K	1	2	3	4	5	6	7	8	9	10	11	12	K-5	6-8	9-12
2019-20	Projection	147	153	160	180	181	186	204	216	248	200	229	230	214	1,007	668	873
	Prelim Enrollment	173	162	164	185	180	176	190	213	239	215	228	221	205	1,040	642	869
	Difference	26	9	4	5	-1	-10	-14	-3	-9	15	-1	-9	-9	33	-26	-4
		15.3%	5.4%	2.3%	2.5%	-0.3%	-5.4%	-7.3%	-1.6%	-3.6%	6.8%	-0.3%	-4.2%	-4.3%	3.2%	-4.0%	-0.5%

Slide 2

CD1

This table has been updated

Conner Dickes, 8/13/2019

Oct. 1st Enrollment

- Oct. 1st enrollment numbers are the standard enrollment figures used in CT – they are the figures required to be reported to the State Dept of Ed
- Enrollments fluctuate over the course of a year, and especially in the beginning of a school year
- Did not want to delay understanding potential impacts of current enrollment trends, so this set of projections relies on preliminary August 13, 2019 enrollment numbers
- August 30th numbers below
 - Official numbers will change on Oct. 1st and enrollment projections should be updated then

School Year	K	1	2	3	4	5	6	7	8	9	10	11	12	PK	PK-12 Total	K-12 Total	K-5 Total	6-8 Total	9-12 Total
8-13-19 Prelim	173	162	164	185	180	176	190	213	239	215	228	221	205	47	2,598	2,551	1,040	642	869
8-30-19 Prelim	177	164	162	184	186	178	190	218	243	221	224	224	204	54	2,629	2,575	1,051	651	873
Variance:															31	24	11	9	4

Slide 3

CD1

This table has been updated

Conner Dickes, 8/13/2019

Updated Persistency Ratios

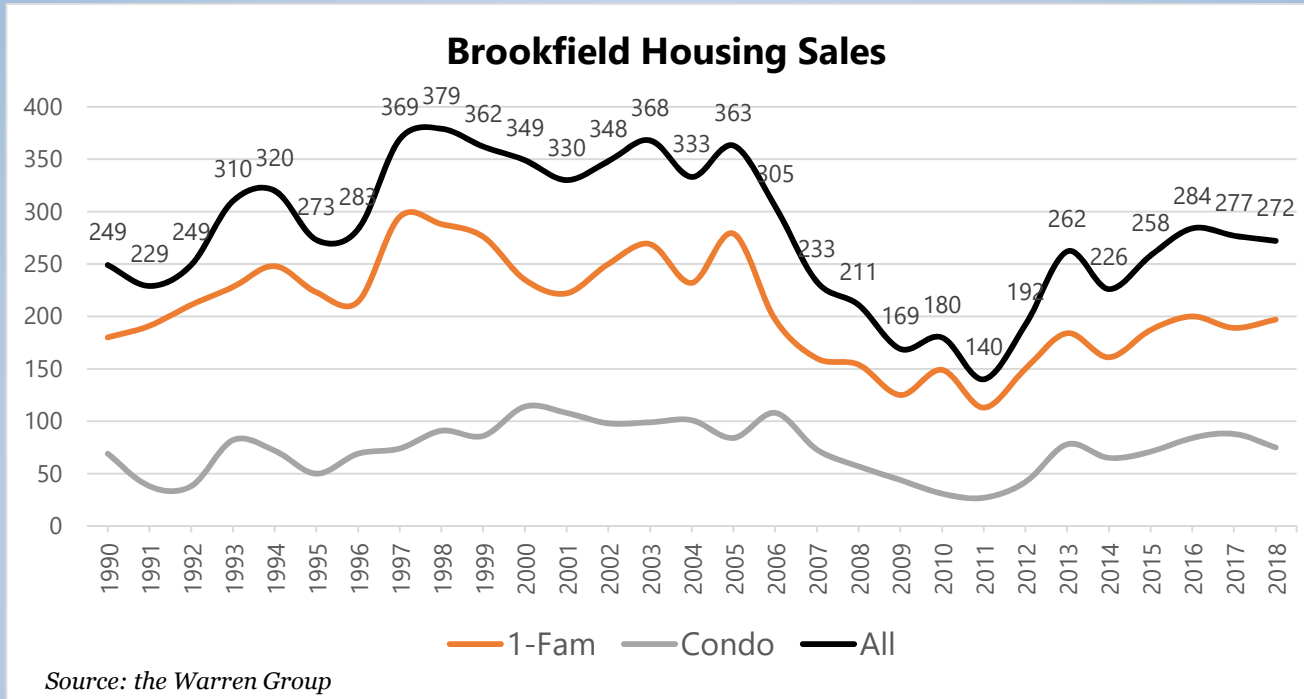
Persistency > 1.0 indicates in-migration to the grade cohort from one year to the next

Kindergarten cohorts are compared to birth cohorts five years previous

Kindergarten through 12th Grade Persistency Ratios by School Year 2008-09 to 2019-20														
Year	Birth-K	K-1	1-2	2-3	3-4	4-5	5-6	6-7	7-8	8-9	9-10	10-11	11-12	Migration Estimate
2008-09	1.1369	1.3385	0.9412	1.0615	0.9913	1.0459	1.0381	1.0293	1.0082	0.9574	1.0077	0.9816	0.9717	2.70%
2009-10	1.0682	1.0314	0.8908	1.0417	1.0053	1.0176	1.0341	1.0505	0.9959	0.9715	0.9960	0.9885	1.0225	2.35%
2010-11	1.0125	1.0426	1.0508	1.0774	1.0450	1.0471	1.0390	1.0094	1.0306	0.9918	1.0209	1.0366	0.9922	3.94%
2011-12	1.1280	1.0988	1.0612	1.0048	1.0479	1.0191	1.0400	0.9917	0.9907	0.9746	0.9835	1.0000	0.9922	1.37%
2012-13	1.1722	1.0973	1.0225	1.0048	1.0288	1.0000	1.0423	1.0192	1.0168	0.9858	1.0043	0.9707	1.0082	1.92%
2013-14	1.1232	1.0678	1.0591	1.0440	1.0478	1.0561	1.1086	1.0180	1.0047	0.9298	1.0239	1.0043	0.9914	4.45%
2014-15	1.1210	1.0387	1.0000	1.0279	0.9947	1.0183	1.0575	1.0103	0.9912	1.0282	1.0133	1.0047	1.0043	1.73%
2015-16	1.2632	1.1511	1.0311	0.9841	1.0181	1.0106	1.0090	1.0000	1.0204	0.9509	0.9909	1.0132	1.0186	0.72%
2016-17	1.2344	1.0298	1.0500	1.0783	1.0161	1.0578	1.0995	1.0133	1.0084	1.0200	1.0047	0.9862	0.9913	4.30%
2017-18	1.3455	1.0823	1.0000	1.0179	1.0000	1.0899	1.0336	0.9857	1.0132	0.9253	1.0490	1.0047	1.0047	2.31%
2018-19	1.3909	1.0608	1.0409	1.0520	1.0000	1.0279	1.0340	0.9919	1.0290	1.0130	1.0269	0.9720	0.9721	2.12%
2019-20	1.5043	1.0588	1.0446	1.0393	0.9890	1.0292	1.0326	1.0000	0.9795	1.0094	0.9744	0.9651	0.9856	0.94%
Long Term Avg.	1.2084	1.0915	1.0160	1.0361	1.0153	1.0350	1.0473	1.0099	1.0074	0.9798	1.0080	0.9940	0.9962	
5-Year Avg.	1.3476	1.0766	1.0333	1.0343	1.0046	1.0431	1.0417	0.9982	1.0101	0.9837	1.0092	0.9882	0.9945	
3-Year Avg.	1.4136	1.0673	1.0285	1.0364	0.9963	1.0490	1.0334	0.9925	1.0072	0.9826	1.0168	0.9806	0.9874	
3-yr wgt	1.4401	1.0634	1.0359	1.0400	0.9945	1.0389	1.0332	0.9949	1.0016	0.9966	1.0043	0.9740	0.9843	
2-Yr Wgt Avg.	1.4665	1.0595	1.0434	1.0436	0.9927	1.0288	1.0331	0.9973	0.9960	1.0106	0.9919	0.9674	0.9811	

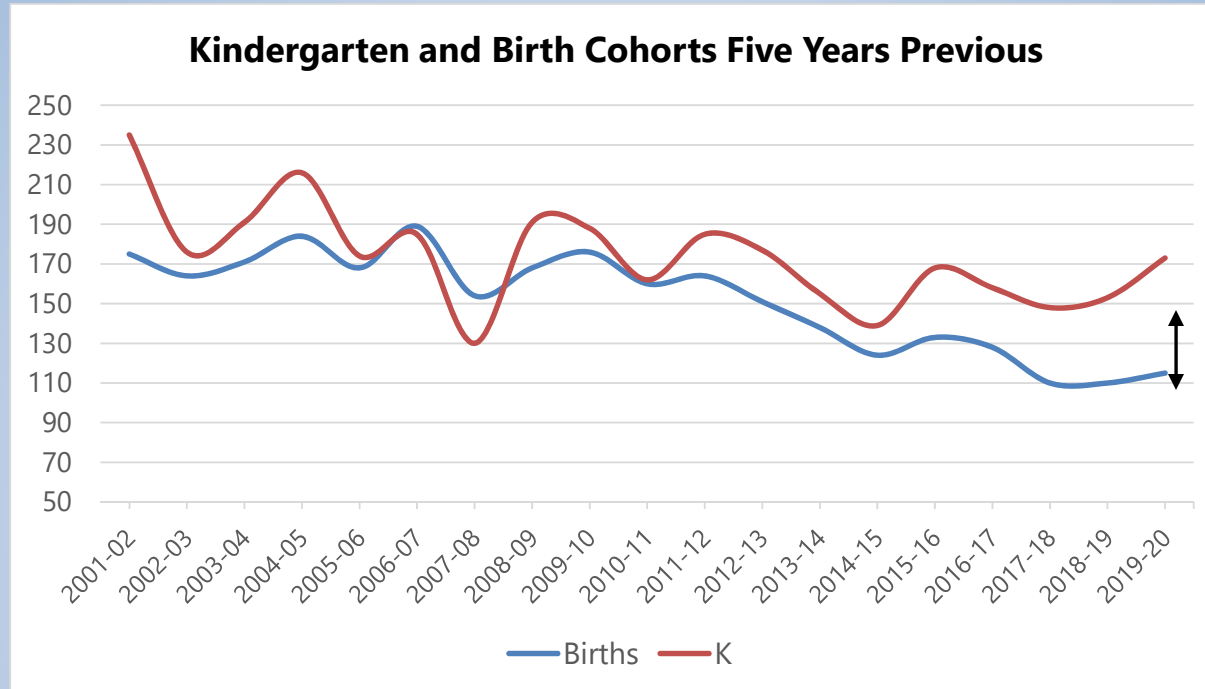
- Increase in birth-K ratio over the last four years; however, 2019-20 ratio represents significant jump
- Positive, but steady in-migration estimate (2nd -7th grade cohorts compared to 3rd-8th grade cohort one year later)

Housing Sales



- Housing sales rebounded significantly from 2011 to 2016 (more than doubling the total annual sales rate)
- Sales appear to have plateaued, with stable sales numbers from 2016 to 2018
 - Single-family sales dipped slightly in 2017 and condo sales declined slightly in 2018

Kindergarten Ratio



- During a period of stable, low birth rates, Kindergarten cohorts increasingly diverging from birth cohorts
- Young children arriving through housing sales or rental opportunities
 - Steady in-migration of older cohorts signals families with very young children moving to Town
 - Plateau in housing sales over the last three years may temper continued growth of Birth-K ratio

Student Generation Analysis

To understand impact of housing sales on enrollment trends, conducted a student generation analysis

Method:

- Home sales from the past four years were geo-located
- Student enrollment data from the past two years was also geo-located
- Students who were “new to district,” as determined by comparing student id numbers from one year to the next, were identified
- New-to-district students were compared to housing sales from the three previous quarters – if residing at an address that registered a sale, then considered a student generated through housing sales
- Because most Kindergarten students are new to district, and must be at least five years of age, the entire cohort is compared to the previous four years of housing sales to determine Kindergarten generation from housing sales

Students Generated from Home Sales

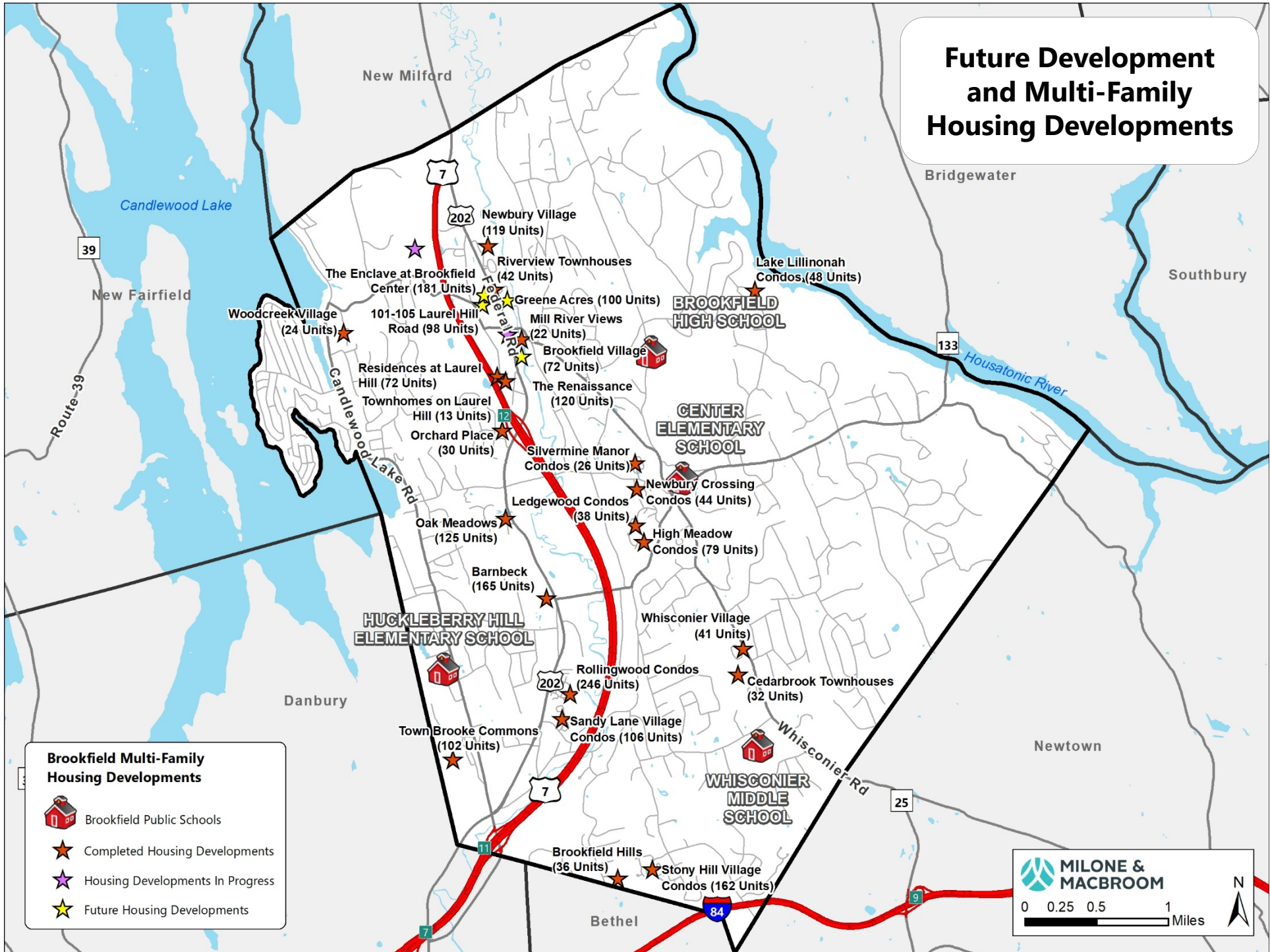
- Average new student generation rate from housing sales over the last two years is 0.17, with 2018-19 recording 0.19
 - At about 275 sales annually, approximately 45-50 new 1st – 12th grade students per year through housing sales activity
- An additional 12 Kindergarteners per year generated from housing sales over the last two years
- Roughly in line with 2% in-migration rate of 2017-18 and 2018-19, but high for estimated 1% in-migration rate of 2019-20

School Year	2018-19	2019-20
Housing Sales		
Total Sales for 3 Previous Qtrs (Used for Grades 1-12 Comparison)	295	183
Total Sales for 4 Previous Years (Used for K Comparison)	1,361	1,279
Students		
Total New to District (Grades 1-12)	194	125
# of Total New to District (1-12) Matched to Home Sale	56	25
Elem. New to District (1-5)	96	60
# of Elem. New to District (1-5) Matched to Home Sale	35	13
Total Kindergarten Students	153	173
# of Kindergarteners Matched to Home Sale	61	68
Student Generation from Housing Sales		
Total Student Generation per Sale (Grades 1-12)	0.19	0.14
Elem. Student Generation per Sale (Grades 1-5)	0.12	0.07
Kindergarten Student Generation per Sale	0.04	0.05

Multi-Family Generation Analysis

- Significant new development of multi-family in Brookfield, not all of which is ownership stock accounted for in housing sales analysis
- Therefore, analyzed student generation at existing multi-family developments to understand potential student generation from approved multi-family developments
- Identified housing developments and compared to enrollment data set

Future Development and Multi-Family Housing Developments



MILONE & MACBROOM

0 0.25 0.5 1 Miles

Built Multi-Family Housing

- Out of over 1,600 housing units in multi-family developments, about 300 K-12 students generated
- Highest student yields from a mix of development types – both older and newer developments, ownership and rental, etc.
- Smaller unit sizes (studio, 1-2 bedroom) appear to yield fewer students
- Average K-12 student generation rate: 0.187 students per unit

Housing Complexes	Total Units	Type	Unit Splits	2018-19 Total Students (K-12)	2019-20 Total Students (K-12)	Avg. Student Yield
Ledgewood Condos	38	Condos		25	25	0.658
Brookfield Hills	36	Condos		15	17	0.444
Residences at Laurel Hill	72	Apartments	2 BR	28	29	0.396
Oak Meadows	125	Townhomes		49	49	0.392
Mill River Views	22	Condos		8	9	0.386
Cedarbrook Townhouses	32	Townhomes		12	11	0.359
Whisconier Village	41	Condos		14	15	0.354
Riverview Townhouses	42	Townhomes & Condos	2-3 BR	12	14	0.310
Town Brooke Commons	102	Apartments		32	28	0.294
Lake Lillinonah Condos	48	Condos		11	12	0.240
Sandy Lane Village Condos	106	Condos		23	23	0.217
Newbury Crossing Condos	44	Condos		9	9	0.205
Silvermine Manor Condos	26	Condos		5	5	0.192
Woodcreek Village	24	Condos		2	7	0.188
Stony Hill Village Condos	162	Condos		25	21	0.142
Orchard Place	30	Apartments	1 BR	2	3	0.083
Townhomes on Laurel Hill	13	Townhomes	2 BR	0	2	0.077
Barnbeck	165	Apartments	Studio, 1-2 BR	11	13	0.073
Brookfield Village	72	Apartments	1-2 BR	4	6	0.069
Rollingwood Condos	246	Condos		14	14	0.057
Newbury Village	119	Elderly		1	1	0.008
High Meadow Condos	79	Condos		0	0	0.000
Grand Total	1,644			302	313	0.187

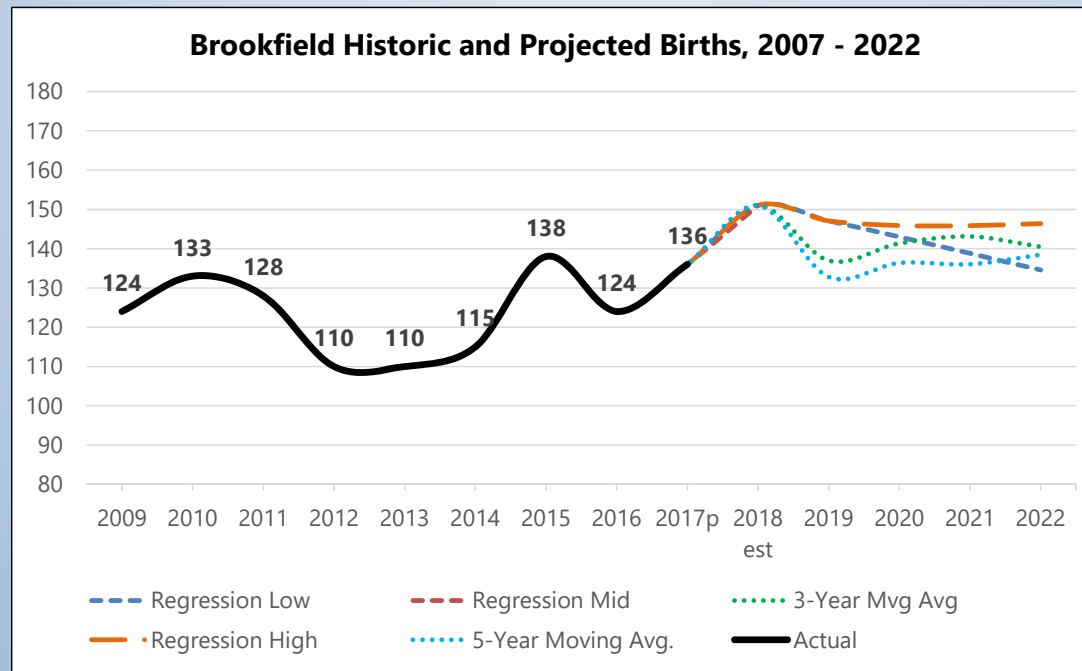
Approved Housing Complexes

Approved Housing Complexes	Address	Type	Unit Split	Total Units	Potential Student Yield
101-105 Laurel Hill Road	105 Laurel Hill Road	Apartments	1-2 BR	98	18
Greene Acres	857 Federal Road	Apartments	1-2 BR	100	19
The Enclave at Brookfield Center	874 Federal Rd	Apartments	1-3 BR	181	34
The Renaissance	777 Federal Road	Apartments	Unkown	120	22
TOTAL:				499	93

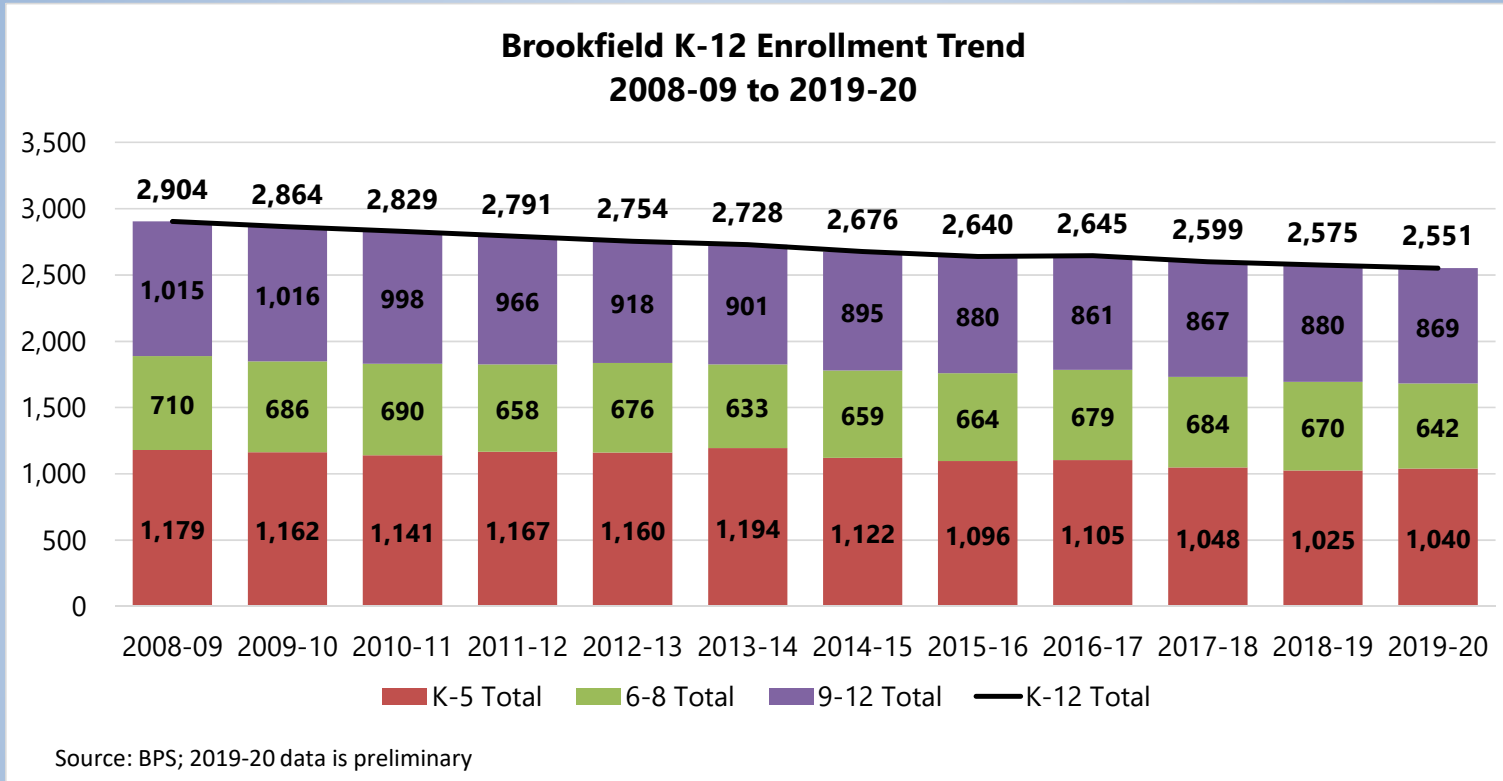
- Future housing developments that have yet to be built
- Additional 500 units represent a 30% increase in multi-family housing stock
- Based on average student yield from current multi-family, an additional 90-100 students (K-12) likely as these units are built and occupied

Updated Birth Data

- Increased births estimated for 2017 and 2018, based on preliminary DPH data
- 2015 spike in births to enter K next year
- Regression analysis on birth trends yielded a reliable model ($r^2: 0.995472$) tied to housing sales and local and county unemployment rates
 - Used model to prepare low, medium and high projected births



Enrollment Trends



- Slowing rate of decline, with only 2% loss from 2017-18 to 2019-20
- Relative stability at K-5 level over the last three years

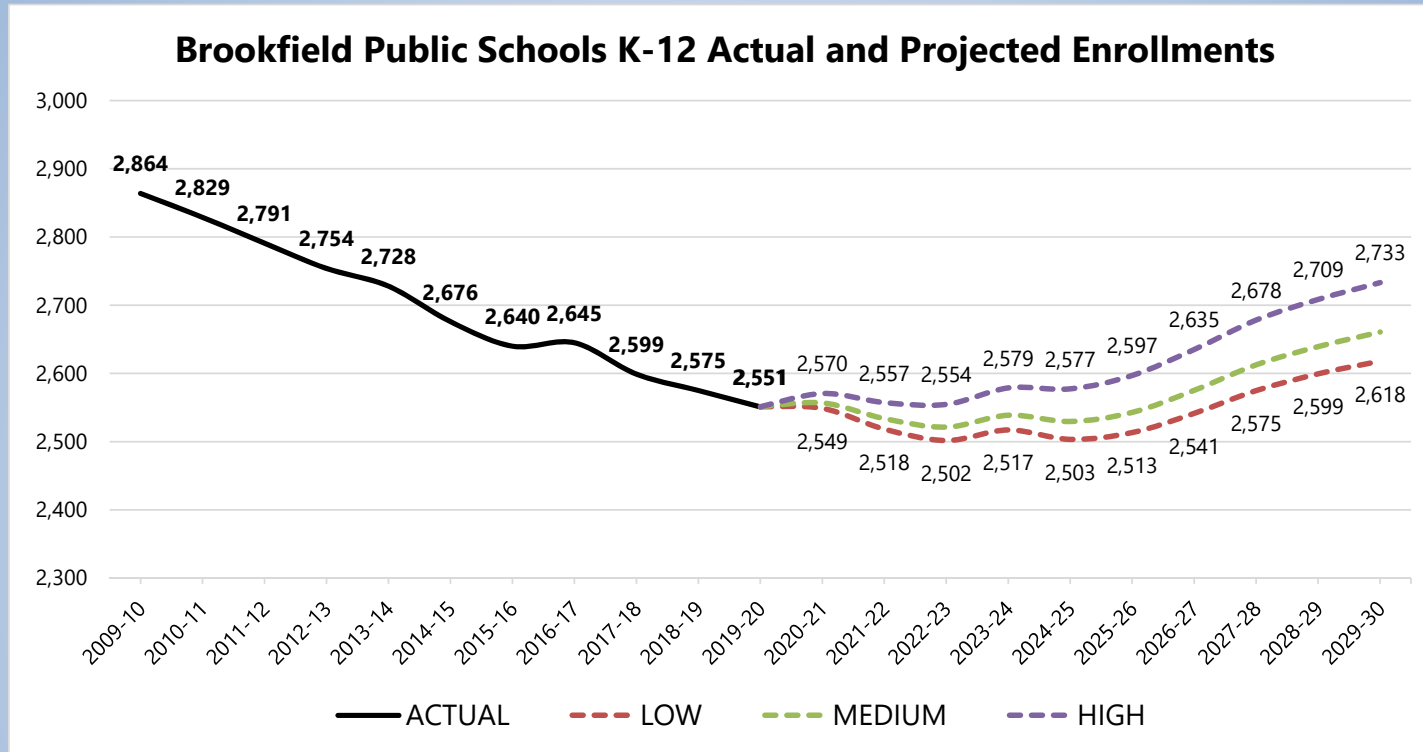
Projection Methodology

- The cohort survival methodology relies on observed data from the recent past in order to project the near future
- Persistency Ratios account for the various external factors affecting enrollments: housing characteristics, residential development, economic conditions, student transfers in and out of system, and student mobility
- Changes in population, housing stock and tenure, and economic conditions help explain persistency ratios, and varied assumptions on demographic and housing factors influence persistency ratios used to project enrollment

Projection Assumptions

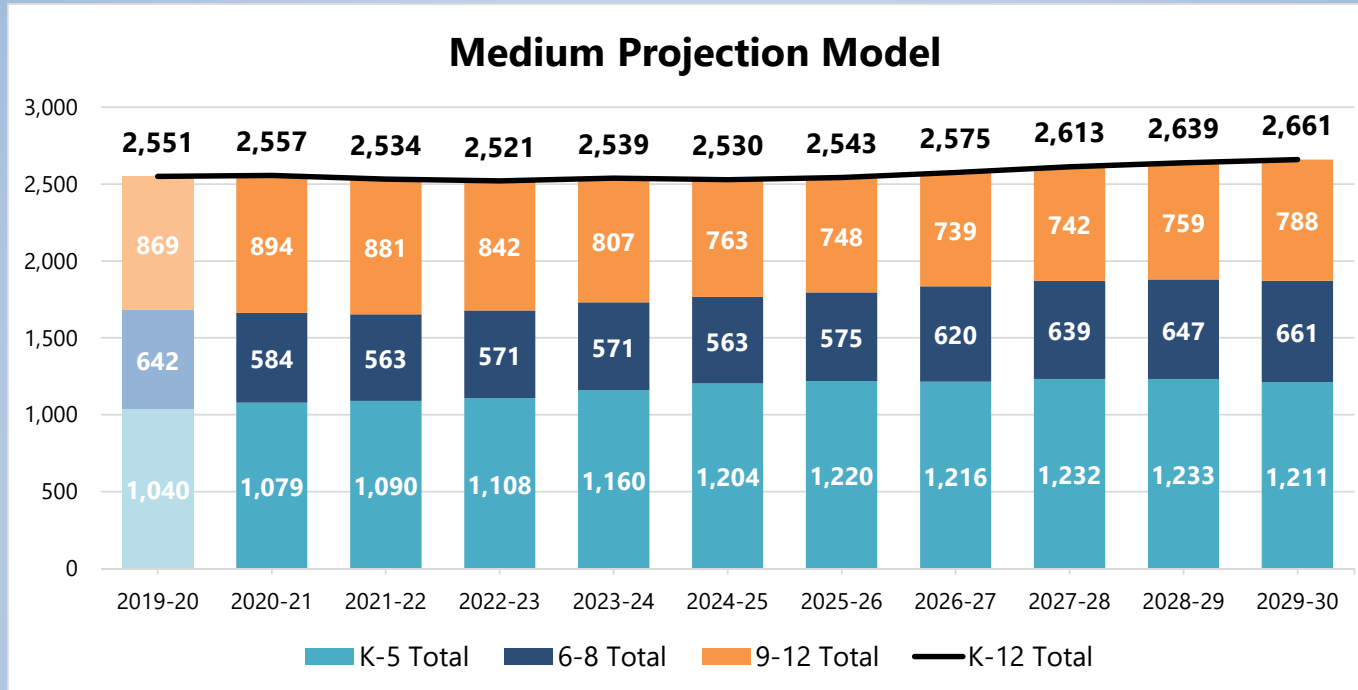
- Three sets of projections were prepared for planning purposes:
 - High – Assumes housing sales between 275-300 per year and a decreasing county unemployment rate to 4.0 and local unemployment rate of 3.2
 - Medium – Assumes stable housing sales and unemployment trends
 - Low – Assumes housing sales between 200 and 250 per year and an increasing county unemployment rate to 5.5 and local unemployment rate to 5.0
- A variable Birth – Kindergarten persistency ratio was used in all three models, assuming continued buildout of multi-family units over the next four years and subsequent slow down in construction in the latter half of the projection horizon
- PreK enrollment held at current levels
- Greatest confidence in first five years because based on known data

District Projections



- The low model projects slight enrollment decline over next five years (-2%), before stabilizing and increasing out ten years (3%)
- The high model projects increasing enrollment (1%) over the next five years, and continued growth in the latter half of the projection horizon (7%)
- Because housing sales have recently plateaued, recommend using the medium projection model for planning purposes

District Projections



- Total enrollment projected to be stable over the next five years (less than 1% decrease), and grow by about 4% out ten years
- Over the next eight years, K-5 enrollments projected to peak at 1,232 in 2027-28
 - Relatively large birth cohort entering next year affects the first half of projection horizon
 - Model assumes housing sales continue at current plateau throughout, but construction of new multi-family decreases in latter half, so variable Birth – K ratio used in later years

Medium Projections

School Year	Birth Year	Births	K	1	2	3	4	5	6	7	8	9	10	11	12	PK	PK-12 Total	K-12 Total	K-5 Total	6-8 Total	9-12 Total
2019-20	2014	115	173	162	164	185	180	176	190	213	239	215	228	221	205	47	2,598	2,551	1,040	642	869
2020-21	2015	138	186	185	167	170	184	187	182	189	213	238	216	222	218	47	2,604	2,557	1,079	584	894
2021-22	2016	124	167	199	190	173	169	191	193	181	189	213	239	210	219	47	2,581	2,534	1,090	563	881
2022-23	2017	136	180	179	204	197	172	176	198	192	181	189	214	233	207	47	2,568	2,521	1,108	571	842
2023-24	2018	151	198	192	184	212	196	179	182	197	193	181	190	208	229	47	2,586	2,539	1,160	571	807
2024-25	2019	147	191	211	197	190	211	204	185	181	197	192	181	185	205	47	2,577	2,530	1,204	563	763
2025-26	2020	145	186	203	217	205	190	219	211	184	181	196	193	177	182	47	2,590	2,543	1,220	575	748
2026-27	2021	144	182	198	209	225	204	197	227	209	184	181	197	188	174	47	2,622	2,575	1,216	620	739
2027-28	2022	143	181	194	204	217	224	212	204	225	210	183	181	192	185	47	2,660	2,613	1,232	639	742
2028-29	2022	142	180	193	200	211	216	233	219	203	226	209	184	177	189	47	2,686	2,639	1,233	647	759
2029-30	2023	141	179	192	198	207	211	224	241	218	203	225	210	179	174	47	2,708	2,661	1,211	661	788

- Medium model projects significant growth in K-5 in first half
 - 14% increase over five years
 - Maintained out ten years from 2019-20
- Middle and high school grade cohorts continue to decrease over the first half of projection horizon (about 12%) due to smaller cohorts already in the system
 - Middle projected to be 3% above current levels out ten years
 - High projected to decrease another 4% in the latter half of the projection horizon

Questions?

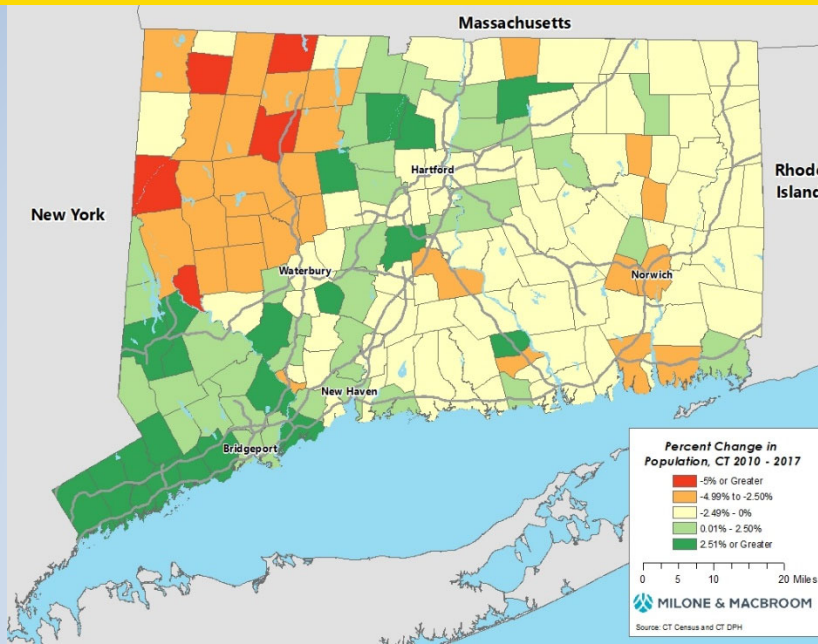
Low Projections

School Year	Birth Year	Births	K	1	2	3	4	5	6	7	8	9	10	11	12	PK	PK-12 Total	K-12 Total	K-5 Total	6-8 Total	9-12 Total
2019-20	2014	115	173	162	164	185	180	176	190	213	239	215	228	221	205	47	2,598	2,551	1,040	642	869
2020-21	2015	138	181	183	167	172	185	185	182	189	212	242	213	221	217	47	2,596	2,549	1,073	583	892
2021-22	2016	124	162	191	189	175	172	191	191	181	189	214	240	206	216	47	2,565	2,518	1,080	561	877
2022-23	2017	136	176	172	197	198	176	177	197	191	181	191	213	232	202	47	2,549	2,502	1,096	568	838
2023-24	2018	151	194	186	177	207	198	181	183	196	190	183	189	206	227	47	2,564	2,517	1,143	569	805
2024-25	2019	147	187	205	193	186	207	204	187	182	196	192	181	183	202	47	2,550	2,503	1,181	564	758
2025-26	2020	145	182	198	212	202	186	213	211	186	181	198	190	175	180	47	2,560	2,513	1,192	578	743
2026-27	2021	144	178	193	204	222	202	191	220	210	185	183	196	184	172	47	2,588	2,541	1,190	616	735
2027-28	2022	143	177	189	199	214	222	208	198	219	209	187	182	190	181	47	2,622	2,575	1,209	627	740
2028-29	2022	142	176	187	195	208	214	228	215	197	219	212	186	176	186	47	2,646	2,599	1,210	630	759
2029-30	2023	141	175	186	194	204	209	220	236	214	196	221	210	180	173	47	2,665	2,618	1,188	646	783

High Projections

School Year	Birth Year	Births	K	1	2	3	4	5	6	7	8	9	10	11	12	PK	PK-12 Total	K-12 Total	K-5 Total	6-8 Total	9-12 Total
2019-20	2014	115	173	162	164	185	180	176	190	213	239	215	228	221	205	47	2,598	2,551	1,040	642	869
2020-21	2015	138	195	184	168	171	184	189	182	189	215	235	219	224	218	47	2,617	2,570	1,090	585	895
2021-22	2016	124	172	207	191	175	170	193	195	181	190	211	239	214	221	47	2,604	2,557	1,107	566	885
2022-23	2017	136	186	183	215	198	174	178	199	194	182	187	214	234	212	47	2,601	2,554	1,133	575	847
2023-24	2018	151	203	197	189	223	197	182	184	198	195	179	190	210	231	47	2,626	2,579	1,192	577	810
2024-25	2019	147	194	216	204	197	222	207	188	183	199	192	182	186	208	47	2,624	2,577	1,240	570	767
2025-26	2020	145	189	207	223	213	196	233	214	187	184	196	195	178	184	47	2,644	2,597	1,260	584	753
2026-27	2021	144	184	200	214	232	211	205	241	212	188	181	199	191	176	47	2,682	2,635	1,247	641	747
2027-28	2022	143	182	195	208	223	231	222	212	239	214	185	184	195	189	47	2,725	2,678	1,261	665	753
2028-29	2022	142	181	194	202	216	222	242	229	211	241	210	188	180	193	47	2,756	2,709	1,257	681	771
2029-30	2023	141	180	193	201	210	215	232	250	227	212	237	213	184	178	47	2,780	2,733	1,231	690	812

Growth in Region



School District	2008-09	2009-10	2010-11	2011-12	2012-13	2013-14	2014-15	2015-16	2016-17	2017-18	2018-19	Trend
Bethel	3,073	3,042	2,938	2,970	2,975	2,989	2,928	2,971	2,996	3,059	3,112	
Brookfield	2945	2898	2870	2834	2789	2762	2708	2692	2673	2639	2630	
Danbury	10,041	10,186	10,343	10,488	10,601	10,762	10,912	11,157	11,371	11,483	11,531	
New Fairfield	3,052	3,029	2,919	2,868	2,798	2,726	2,653	2,497	2,394	2,308	2,246	
New Milford	4,894	4,857	4,744	4,659	4,600	4,484	4,344	4,245	4,217	4,133	3,991	
Newtown	5,602	5,490	5,429	5,278	5,115	4,878	4,731	4,588	4,470	4,407	4,306	

Source: CSDE EdSight