Colchester Public Schools Enrollment Projected to 2032

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Introduction

This report presents a ten-year projection of enrollment for the Colchester Public Schools in grades PK-2, 3-5, 6-8 and 9-12. It is based on resident and non-resident students enrolled in Colchester schools. The report includes 53 years of enrollment to place the projection into a wider historical perspective. One of the primary drivers of future enrollment is births to residents. The report examines births and their relationship to kindergarten enrollment. Several factors that influence school enrollment - town population, women of child-bearing age, employment, housing, grade 9 retention, high school dropouts, non-public enrollment, resident enrollment in other public schools, non-resident enrollment in Colchester schools and migration - are presented. Finally, the accuracy of earlier projections is examined.

Enrollment projections are a valuable planning tool. For budgeting, the numbers can place requested expenditures into a per pupil context. This can inform the public about which expenditures represent continuing expenditures to support on-going programs and expenditures for school improvement and program expansion. They are an essential step in determining the staffing that will be needed in the future. This may facilitate the transfer of teachers from one grade to another or allow the hiring process to start earlier, which can increase the likelihood of attracting the best teachers in the marketplace. Projections are a critical and required step in planning for school facilities. The State of Connecticut requires eight-year school-based projections as a critical component of determining the size of the project for which reimbursement is eligible. This report is appropriate for that purpose for all of your schools. In some communities the projection can determine the number of places they can make available to urban students as part of a regional desegregation effort.

This projection was run after the Covid-19 pandemic, which had an impact mostly on elementary enrollment. In projections I have run, I have observed a continued decline in non-public school enrollment, a decline in births in 2020, an increase in births in 2021, a slight decrease in magnet school enrollment, more families deciding to home-school their children and their return. Each town is a little different. The trick is to observe the data and make a judgement which patterns are transient and adjust the projection accordingly. A key assumption behind the method used in this report is that enrollment patterns in the near future will be reflected in the patterns of the recent past. I have assumed that the impact of the pandemic is now behind us. I have made what I feel are the best possible adjustments to this unique situation.

Perspective

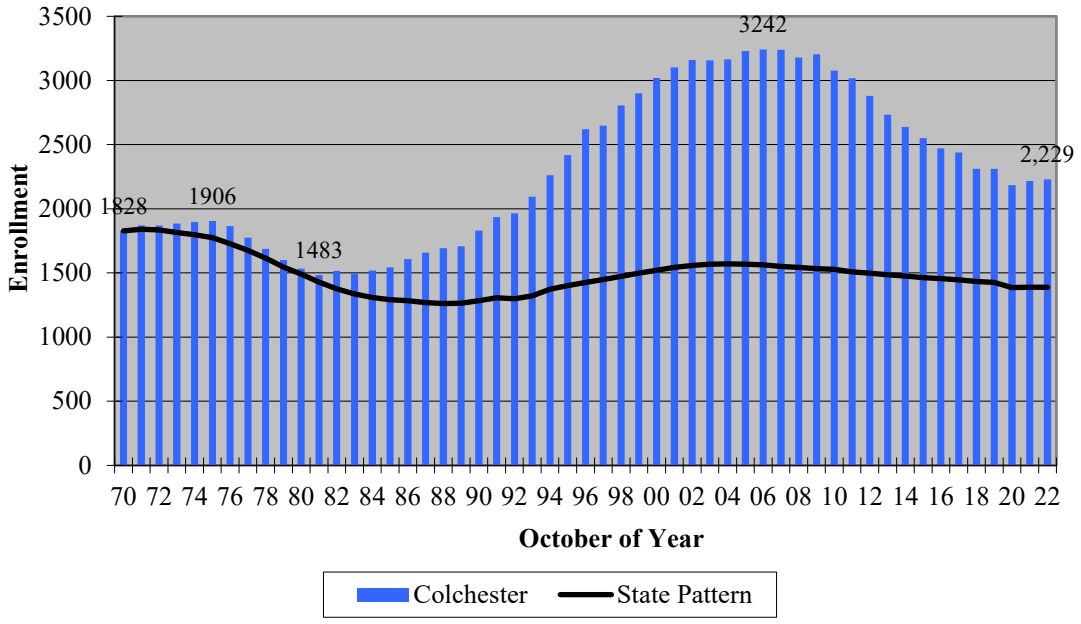
Enrollment projections typically use the most recent five years of data. While the most recent past is viewed as the best predictor of the near future, it is informative to look at a broader perspective. Figure 1 shows the enrollment in Colchester from 1970 to date.

Enrollment in the Colchester Public Schools grew from 1,828 students in 1970 to 1,906 students in 1975. Between then and 1981, enrollment went on a brief decline that took it to 1,483 students. In those six years, enrollment declined by 423 students or 22.2 percent. Between 1981 and 2006 enrollment increased by 1,759 students. The 3,242 students enrolled in 2006 was the all-time peak and represented a huge 119 percent increase over the 1981 low. Enrollment then entered a second downward cycle. Between 2006 and 2020 enrollment declined by 1,057 students or 32.6 percent. Enrollment may be in the initial stage of a third growth cycle. The 2022 enrollment of 2,229 students is up 2.0 percent from the 2020 low.

Colchester's enrollment pattern is different from that of the state's public schools. Between its 1971 peak and 1988, Connecticut public school enrollment declined by 31.5 percent. State enrollment hit a secondary peak in 2004. It grew 24.5 percent between the 1988 low and 2004. State enrollment is still in a downward cycle. It declined by 11.5 percent between 2004 and 2022. The 1970 to 1975 growth in

Colchester was steeper that the state's. The subsequent enrollment decline in Colchester was much shorter in length than the state's and less deep. Colchester's 1981 to 2006 growth period was much longer than the state's and very much greater in magnitude. Colchester's second cycle of decline has been shorter than the state's but more severe. Had Colchester followed the state pattern of enrollment, it would have had only 1,389 students enrolled in October of 2022 instead of your enrollment of 2,229.

Figure 1. Colchester Enrollment 1970 to Date



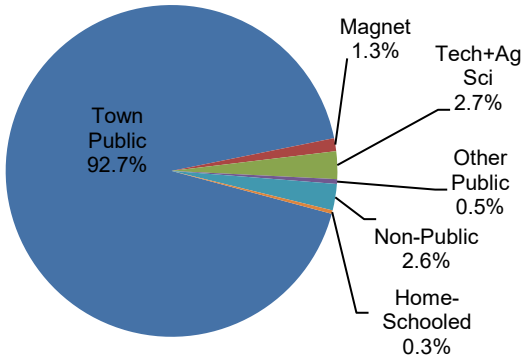
Current Enrollment

Table 1 and Figure 2 provide a picture of where Colchester residents attended school on October 1, 2022. The data were provided by the Colchester Central Office to the Connecticut State Department of Education. They are subject to minor changes. They show that 92.7 percent of Colchester's school-age residents attended the Colchester Public Schools in October of 2022. Sixty-one school-age residents (2.6 percent) attended non-public schools in state. The number attending private schools out-of-state is

Table 1. 2022 Enrollment

	Number	Percent
Residents		
A. Colchester Public	2,198	92.7%
B. Magnet	30	1.3%
C. Tech.+ Ag. Sci.	64	2.7%
D. Other Public	11	0.5%
E. Non-Public	61	2.6%
F. Home-Schooled	8	0.3%
Total (A+B+C+D+E)	2,372	
G. Non-Residents	31	
Total Enrollment (A+G)	2,229	

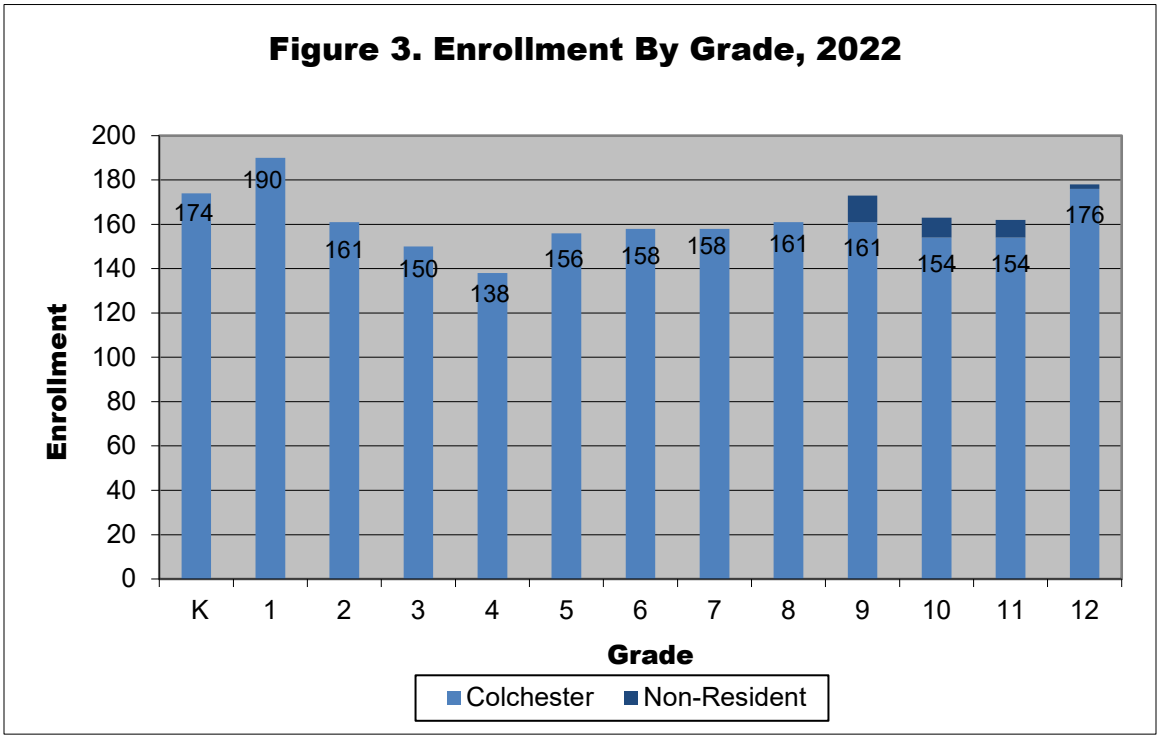
Figure 2. Schools Attended by Town Residents, 2022



not known. This figure includes five students paid by the district to attend a non-public special education program. Thirty school-age residents attended charter or magnet schools (1.3 percent). Sixty-four students (2.7 percent) attended a state technical high school or an agriculture science program. Eleven students (0.5 percent) attended another public school, most in a special education program run by a Regional Service Center. There were eight students the district recorded as being home-schooled (0.3 percent). There were 31 non-residents who attended Bacon Academy on a tuition basis in 2022. The projections in this report are based upon the 2,229 residents and non-residents who attend the Colchester Public Schools on October 1, 2022 (See "Total Enrollment" on the prior page).

Figure 3 shows the October 1, 2022 enrollment by grade of Colchester and tuitioned non-resident (primarily Norwich) students in the Colchester Public Schools. The children in pre-kindergarten programs are not shown. Grade 1 had the largest enrollment with 190 students. Kindergarten and grade 12 had more than 170 Colchester residents enrolled. Grade 4 was the smallest class with only 138 students. No other grade had less than 150 residents enrolled. If current conditions continue, this year's kindergarten class of 174 students could have 177 students when it enters grade 3 at the Jack Jackter School in 2025, 180 students when it enters grade 6 at the William J. Johnson Middle School in 2028 and 173 resident students when it enters grade 9 at Bacon Academy in 2031. All projected enrollments are above the current enrollment in those grades. The current year enrollment by grade is the starting point for this projection. How it moves forward is discussed below.

Figure 3. Enrollment By Grade, 2022



Projection Method

The projections in this report were generated primarily using the cohort survival method. This is the standard method used by people running enrollment projections. For the grades above kindergarten, I compute grade-to-grade growth rates for ten years (see Appendices A and B). For example, if the number of fourth graders this year is 143 and the number of third graders last year was 140, then the growth rate is 1.021. Growth rates above 1.000 indicate that students moved in; transferred from non-public schools, other public schools, or home-schooling; or were retained. Growth rates below 1.000 mean that students

moved out, transferred to private or other public schools, left to be home-schooled, dropped out, or were not promoted from the prior grade. For each grade I calculated five different averages of the year-to-year growth rates: a three-year average; a weighted three-year average; a three-year average from 2018, 2019 and 2022; a five-year average and ten-year median. I choose the average that seems to best fit the data. The average growth rate for a grade is applied to the prior year's enrollment from the prior grade. The projection builds grade by grade and year by year.

The growth rates used in the projection in grades 1-5 were based on three-year averages of the observed grade-to-grade growth in 2018, 2019 and 2022. This should eliminate the negative impact of Covid-19 on enrollment in 2020 and the rebound in 2021. In grades 6-12 I felt comfortable using five-year averages because Covid-19 had a lesser impact on older students.

In grade 9, I adjusted the annual growth rates in 2015 to 2022 to reflect residents only. I then assumed ten students (the average over the past five years) from Norwich would enroll in grade 9 in 2023 and annually thereafter. I projected enrollment using five-year averages of the grade-to-grade growth rates in grades 10-12 for Colchester residents and non-residents combined.

I broke kindergarten into five-year-olds, six-year-olds entering kindergarten for the first time and repeaters. Covid-19 deflated the five-year olds entering in 2020, inflated the number of six-year-olds entering in 2021 and inflated the repeaters in 2021. Thus, I used the average of repeaters in 2018, 2019, 2020 and 2022, the average of kindergartners from births five-years prior from 2018, 2019, 2021 and 2022 and the average of kindergartners from births six-years prior from 2018, 2019, 2020 and 2022.

To extend the projections beyond four years, I needed to estimate births for the years 2023 to 2027. The Connecticut State Department of Public Health recorded a provisional count of 173 births in 2021. That was the most since 2005. I estimated 2022 births from in-state births through September, the five-year pattern of October to December births relative to January to September births and the average out-of-state births in 2020 and 2021. That approach resulted in an estimate of only 136 births in 2022. I used the Connecticut State Data Center's 2017 projections of women of child-bearing ages in 2020, 2025 and 2030 along with my estimate of the 2020 fertility rates for Colchester to estimate births in 2020, 2025 and 2030. I calculated annual growth rates for 2020 to 2025 and 2025 to 2030. In 2023 I applied the 2020 to 2025 growth rate to the average of births in 2020, 2021 and 2022. In subsequent years, I applied the appropriate growth rate to the estimated prior year's births.

Enrollment data from 2012 to 2022 were taken from files provided by the Connecticut State Department of Education. Note that current district-level data on the Department's website may include special education students educated outside of the district and exclude students in a Detention Center. These are recent changes to the way the Department reports enrollment data. Projections require consistency. The data I have chosen for this analysis **exclude** special education students educated outside of the district and may **include** students in a Detention Center. Enrollment data can change daily until an audited final file is closed. This process can take up to two years. Thus, it is possible that the enrollment data in this report could differ slightly from data in earlier reports and that may have been reported by your Board of Education to the public. Births from 1980 to 2022 were provided by the Healthcare Quality, Statistics, Analysis and Reporting Unit of the State Department of Public Health.

Total Enrollment

Table 2 and Figure 4 present the observed total enrollment in Colchester schools from 2012 to 2022 and projected enrollment through 2032. Detailed grade-by-grade data may be found in Appendices A and B. Total enrollment in Colchester fell from 2,880 students in 2012 to 2,185 students in in 2020 and then rebounded to 2,229 students in 2022. Enrollment plummeted by 651 students or 22.6 percent between 2012 and 2022. Public-school enrollment statewide declined 7.4 percent in that period.

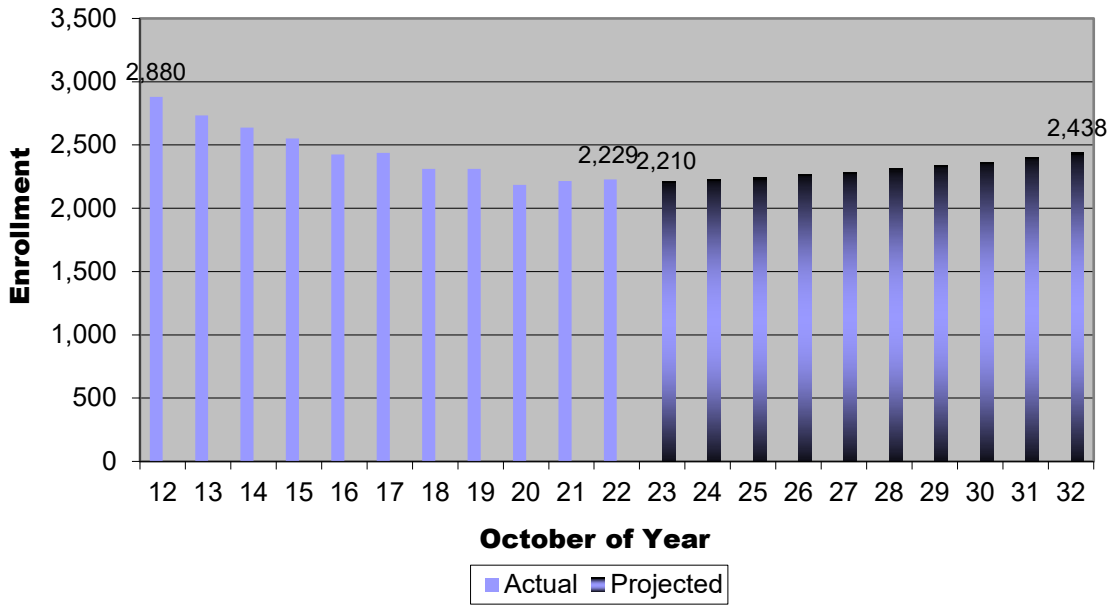
Table 2. Total Enrollment

Year	Students	Percent Change
2012	2,880	
2013	2,733	-5.1%
2014	2,638	-3.5%
2015	2,551	-3.3%
2016	2,426	-4.9%
2017	2,438	0.5%
2018	2,311	-5.2%
2019	2,312	0.0%
2020	2,185	-5.5%
2021	2,216	1.4%
2022	2,229	0.6%
2023	2,210	-0.9%
2024	2,231	1.0%
2025	2,240	0.4%
2026	2,267	1.2%
2027	2,286	0.8%
2028	2,312	1.1%
2029	2,340	1.2%
2030	2,365	1.1%
2031	2,405	1.7%
2032	2,438	1.4%

Between 2012 and 2022, the enrollment loss of 22.6 percent in Colchester was in the third largest among similar (DRG D) towns in the area. Only the 28.7 percent loss in Old Saybrook and the 24.7 percent loss in Clinton were larger. Rocky Hill gained 3.4 percent. The losses in Wethersfield (-1.5 percent), Cromwell (-2.4 percent), East Hampton (-7.0 percent), Newington (-9.5 percent), Berlin (-10.6 percent), and East Lyme (-10.9 percent) were all smaller than Colchester's loss.

Although there may be a dip next October, I believe that the enrollment decline is over. Next year, I anticipate that total enrollment could decrease by 20 students. The projected October 2023 enrollment of 2,210 could be the ten-year low. In October of 2032, enrollment could approach 2,440 students. That would be an increase of about 210 students (9.4 percent) from the October 2022 count and return enrollment to the count of 2017. In the state's public schools, I am projecting a 3.7 percent decline between 2022 and 2032. Total enrollment in Colchester could average close to 2,310 students over the ten-year projection period compared to an average total enrollment of 2,404 students over the past ten years.

Figure 4. Total Enrollment



Colchester Elementary School Enrollment

Table 3 and Figure 5 present actual enrollment at the Colchester Elementary School in October 2012 to 2022 and projected enrollment to 2032. Enrollment by grade may be found in Appendix A. Enrollment in grades PK-2 declined from 612 students in 2012 to 503 students in 2016 and then rebounded to 555 students in 2019. In 2020 it plunged to 498 and then rebounded strongly to 632 students in 2022. There were losses of ten percent or more in 2013, 2016 and 2020. There was a 20.3 growth in 2021 enrollment. The 10-year gain of 20 students represented 3.3 percent of the enrollment in 2012. Public-school enrollment statewide in grades PK-2 declined 7.8 percent in that period.

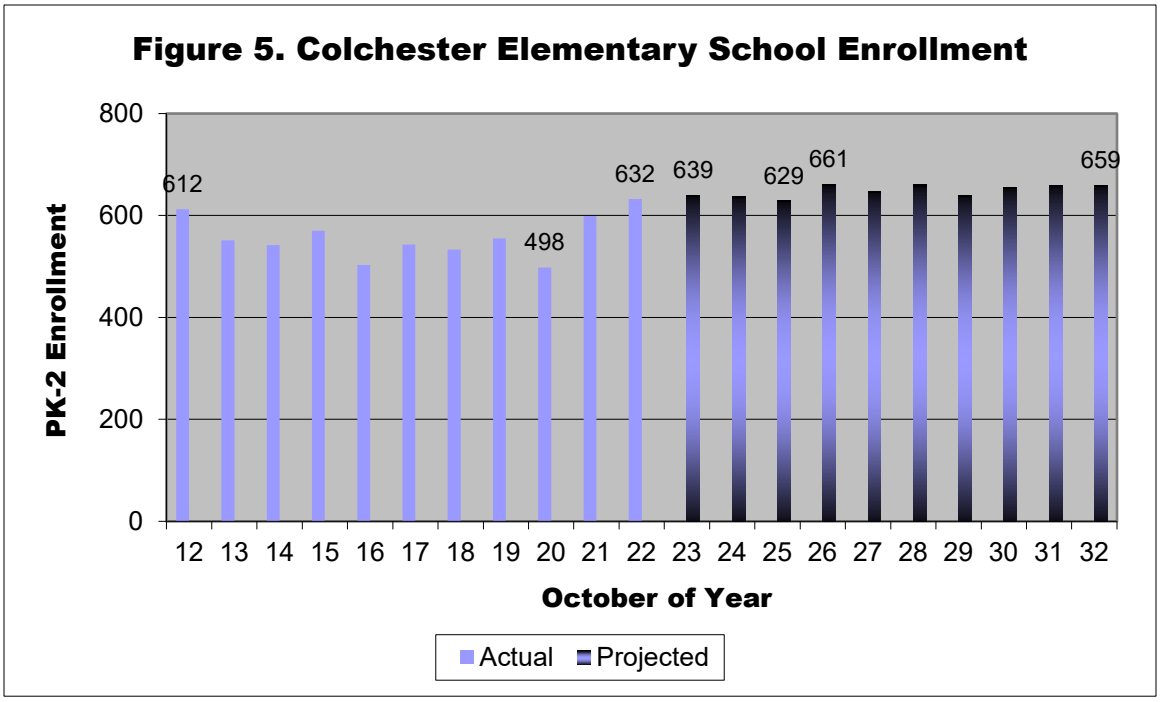
It appears that the decline in early elementary enrollment in Colchester is over. I project next October's enrollment in grades PK-2 could be very slightly above this October. By 2032, PK-2 enrollment at the Colchester Elementary School could be close to 660 students. This would be between the number enrolled in 2011 and 2012. This would be about 25 students more than 2022, a gain of 4.3 percent. In grades PK-2 in the state's public schools, I am projecting a 2.0 percent enrollment growth. Over the ten-year projection period, I believe enrollment in grades PK-2 could average about 650 students compared to the average of 553 students observed over the past ten years.

Table 3. Colchester Elementary School Enrollment

Year	Students	Percent Change
2012	612	
2013	551	-10.0%
2014	542	-1.6%
2015	570	5.2%
2016	503	-11.8%
2017	543	8.0%
2018	533	-1.8%
2019	555	4.1%
2020	498	-10.3%
2021	599	20.3%
2022	632	5.5%
2023	639	1.1%
2024	638	-0.2%
2025	629	-1.4%
2026	661	5.1%
2027	648	-2.0%
2028	660	1.9%
2029	640	-3.0%
2030	655	2.3%
2031	659	0.6%
2032	659	0.0%

These figures include the children in your pre-kindergarten programs. Program enrollment ranged from 53 children in 2016 to 107 children in 2021. My projection model, based on births three- and four-years ago, projects pre-kindergarten enrollment could range from 105 to 114 students over the next ten years.

Figure 5. Colchester Elementary School Enrollment



Jack Jackter School Enrollment

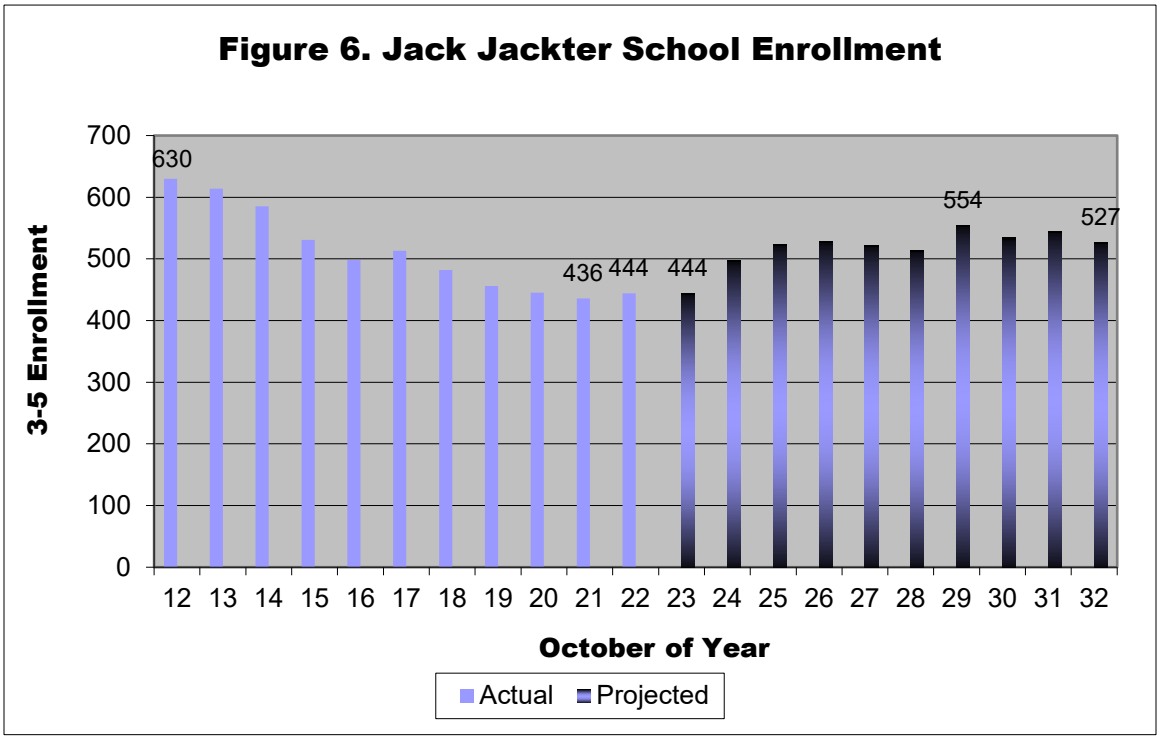
Table 4 and Figure 6 present actual enrollment at the Jack Jackter School from October, 2012 to 2022 and projected enrollment to 2032. Enrollment by grade may be found in Appendix A. Enrollment at the school fell irregularly from 630 students in 2012 to 436 students in 2021. October 2022 enrollment was 444 students. There were declines of greater than five percent in 2015, 2016, 2018 and 2019. Between 2012 and 2022 enrollment declined by 186 students or 29.5 percent. Enrollment in grades 3-5 declined 9.6 percent in that period in the state's public schools.

I believe that enrollment in grades 3-5 at the Jack Jackter School is close to the bottom. Next October's projected enrollment is the same as October 2022 enrollment. I expect enrollment could once again exceed 500 students in 2025. The ten-year peak is projected at 554 students in 2029. The projected 2032 enrollment of about 525 students would be similar to the count in 2015. Over the ten-years from 2022 to 2032, I project a net increase of almost 85 students or about 19 percent. Over the ten-year projection period, I believe enrollment in grades 3-5 could average about 520 students, the observed average over the past ten years. In the state's public schools, I project that enrollment in grades 3-5 will decline by 2.6 percent between 2022 and 2032.

Table 4. Jack Jackter School Enrollment

Year	Students	Change
2012	630	
2013	614	-2.5%
2014	585	-4.7%
2015	531	-9.2%
2016	498	-6.2%
2017	513	3.0%
2018	482	-6.0%
2019	456	-5.4%
2020	445	-2.4%
2021	436	-2.0%
2022	444	1.8%
2023	444	0.0%
2024	497	11.9%
2025	524	5.4%
2026	528	0.8%
2027	522	-1.1%
2028	514	-1.5%
2029	554	7.8%
2030	534	-3.6%
2031	545	2.1%
2032	527	-3.3%

Figure 6. Jack Jackter School Enrollment



William J. Johnson Middle School Enrollment

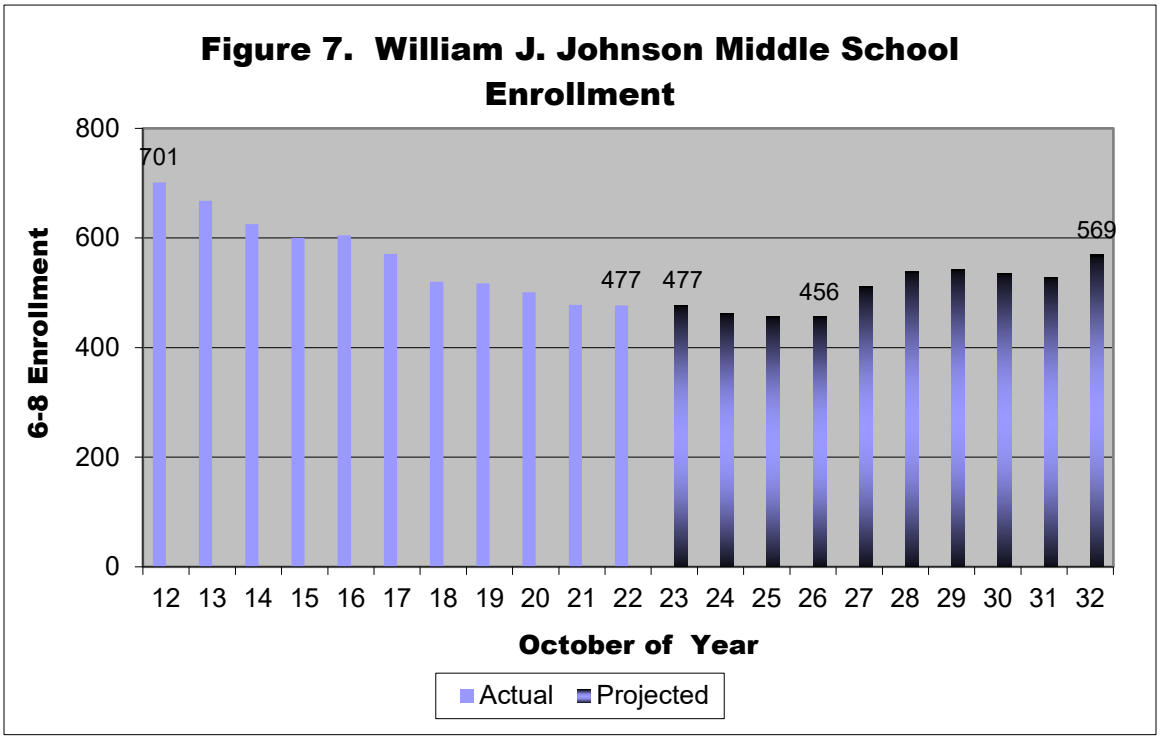
Table 5 and Figure 7 present actual enrollment in grades 6-8 in October, 2012 to 2022 and projected enrollment at the William J. Johnson Middle School to 2032. Enrollment by grade may be found in Appendix B. The school's enrollment fell from 701 students in 2012 to 477 in 2022. That was a loss of 224 students or 32.0 percent. The last time enrollment in these grades was near that level was 1993. There were losses of more than five percent in 2014, 2017 and 2018. Public-school enrollment in Connecticut fell 9.0 percent in those grades in those 10 years.

I expect that enrollment at the William J. Johnson Middle School will drift downward for the next four years and then recover. All the students who will attend these grades over the next ten years school have already been born. Next October, I anticipate that enrollment in grades 6-8 will be the same as October 2022. I expect the enrollment low will come in 2025 or 2026 at about 455 students. Pushed, in part, by a huge increase in 2027, I believe enrollment could be close to 570 students at the projection's end. Over the ten-years, I project about a 19 percent-gain. Over the ten-year projection period, I believe enrollment in grades 6-8 at the Middle School could average about 510 students compared to the average of 556 students in grades 6-8 observed over the past ten years. In the state's public schools, I project that enrollment in grades 6-8 will decline by 5.8 percent in the next ten years.

Table 5. William J. Johnson Middle School Enrollment

Year	Grades 6-8	Change
2012	701	
2013	668	-4.7%
2014	625	-6.4%
2015	600	-4.0%
2016	605	0.8%
2017	571	-5.6%
2018	520	-8.9%
2019	517	-0.6%
2020	501	-3.1%
2021	478	-4.6%
2022	477	-0.2%
2023	477	0.0%
2024	462	-3.1%
2025	456	-1.3%
2026	456	0.0%
2027	511	12.1%
2028	539	5.5%
2029	543	0.7%
2030	536	-1.3%
2031	528	-1.5%
2032	569	7.8%

Figure 7. William J. Johnson Middle School Enrollment



Bacon Academy Enrollment

Grade 9 is the first opportunity to attend state technical high schools and agriculture science and technology centers. October 2022 data show that 83.9 percent of Colchester residents enrolled in grade 9 were enrolled in the district. Ten students (5.2 percent) were enrolled in non-public schools in state. Twenty 9th graders (10.4 percent) were enrolled in a technical high school or an agriculture science program. There was one 9th grade student (0.5 percent) enrolled in an area magnet school and none in another public school.

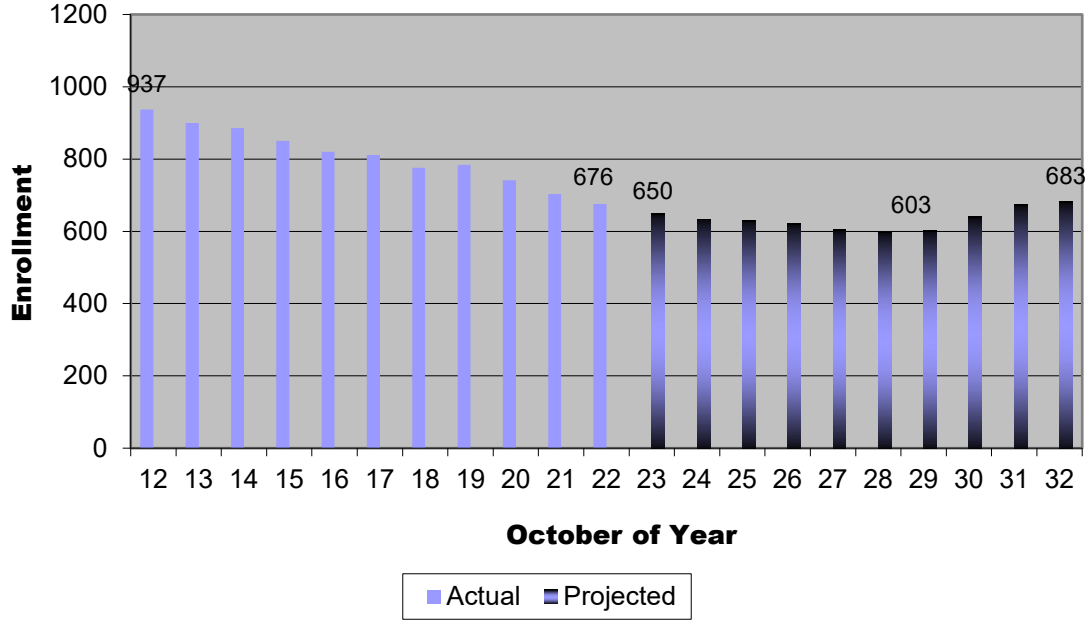
Table 6 and Figure 8 present resident and non-resident enrollment at the Bacon Academy. Grade-by-grade enrollment may be found in Appendix B. Enrollment fell from 937 students in 2012 to 676 students in 2022. This decline came after a 25-year period of enrollment growth that ended in 2009. Between 2012 and 2022, grade 9-12 enrollment decreased by 261 students or 27.9 percent. Statewide public-school enrollment in grades 9-12 fell 4.2 percent in that ten-year period.

Table 6. Bacon Academy Enrollment

Year	Students	Percent Change
2012	937	
2013	900	-3.9%
2014	886	-1.6%
2015	850	-4.1%
2016	820	-3.5%
2017	811	-1.1%
2018	776	-4.3%
2019	784	1.0%
2020	741	-5.5%
2021	703	-5.1%
2022	676	-3.8%
2023	650	-3.8%
2024	634	-2.5%
2025	631	-0.5%
2026	622	-1.4%
2027	605	-2.7%
2028	599	-1.0%
2029	603	0.7%
2030	640	6.1%
2031	673	5.2%
2032	683	1.5%

I expect that next October's enrollment at Bacon Academy will be about 25 students less than October, 2022. I expect an enrollment low of about 600 students in 2028. At the projection's end, I expect enrollment could approach 685 students. The 2032 count would be about 10 students, one percent, above the October 2022 count. Statewide, I have projected a 7.2 percent decline in public school grade 9-12 enrollment between 2022 and 2032. I believe enrollment at the high school could average 635 students over the next ten years compared to the average of 795 students observed over the past ten years.

Figure 8. Bacon Academy Enrollment



Factors Affecting the Projection

The primary reasons for elementary enrollment change lie in the births, the yield from the birth cohort and grade-to-grade migration. Figure 9 presents the actual and provisional births from 1980 to 2021, and estimated births from 2022 to 2027. Births ranged from a high of 245 in 1990 to a low of 111 in 2013. There were 173 births recorded in 2021, the most recent provisional count. The preliminary 2022 count was down to 136 births. From 2000 to 2009, there was an average of 186 births annually. In the five years from 2013 to 2017, this fall's kindergarten through 4th graders, births averaged 135. Births in the 2018 through 2022 period will average close to 148. The projection in years 2027 to 2032 assumes an average of 153 births annually between 2023 and 2027. This was based on the Connecticut State Data Center's 2017 projection of Colchester women of child-bearing ages and my estimate of 2020 fertility rates in Colchester.

Figure 9. Births Since 1980

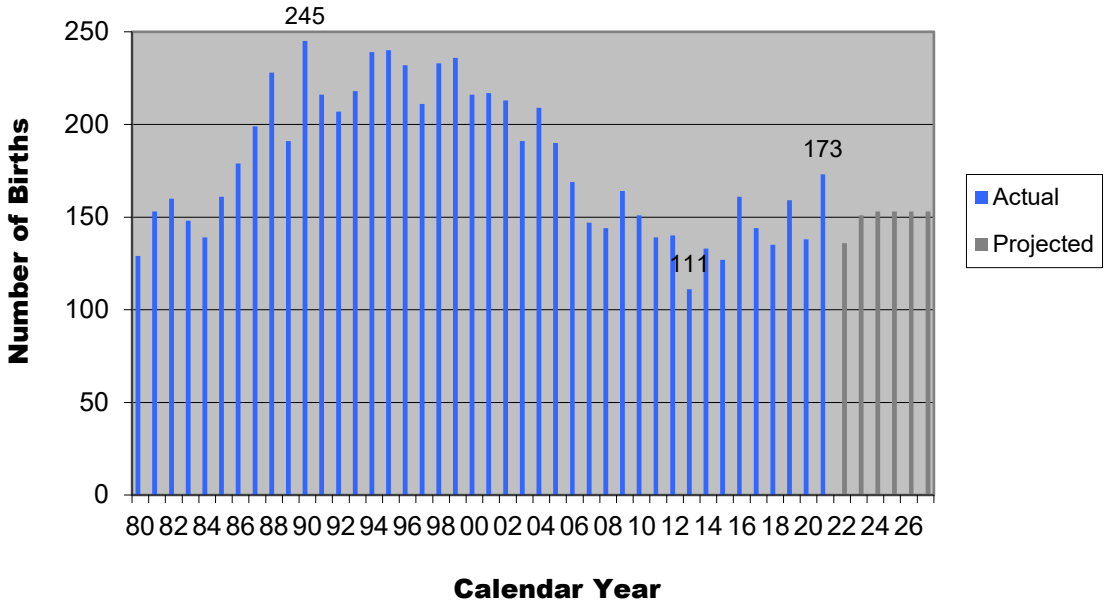
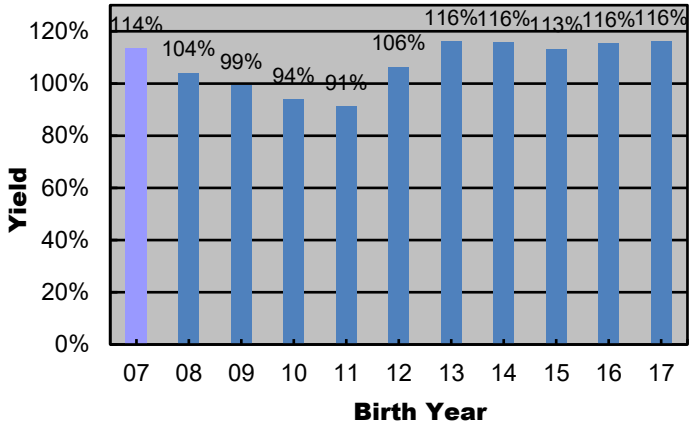


Figure 10 depicts the kindergarten yield five and six years after the birth year from 2007 to 2017 for Colchester residents attending kindergarten in the Colchester Public Schools. The dark blue indicates the birth cohorts affected by full-day kindergarten, which started in 2013. There were 161 births in 2016 and 167 children enrolled in Colchester kindergarten at age five in 2021 and an additional 19 who first enrolled in kindergarten at age six in 2022. That was a yield of 116 percent. The yield from the birth cohort ranged from a low of 91 percent in 2011 to a high of

Figure 10. Kindergarten Yield From Birth Cohort



116 percent in three different years. The estimated yield in 2017 was 116 percent. That yield is an estimate because we will not know the number of students that will first enter as six-year-olds until October, 2023. Yields above 100 percent generally mean that parents who give birth elsewhere move into town before their child enters kindergarten. In the look-back period of the projection, the yield was 116 percent; the median since full-day kindergarten started was 113 percent.

Table 7 gives a history of enrollment in kindergarten since 2012 and relates the components of kindergarten enrollment back to the appropriate birth cohort. Retention is tied to the prior year's kindergarten enrollment. I estimated kindergarten enrollment using the average from 2018, 19, 20 and 22 to estimate future retention, the average from 2018, 19, 21 and 22 to estimate future enrollment from births five-years prior and the average from 2018, 19, 20 and 22 to estimate future enrollment from births six-years prior. Covid-19 impacted retention in 2021, enrollment from births five-years prior in 2020 and enrollment from births six-years prior in 2021. Thus, I projected future kindergarten enrollment from 103.5 percent of births five years ago, 12.1 percent of births six years ago, and 2.5 percent of current kindergarten students retained.

Table 7. Analysis of Kindergarten Enrollment

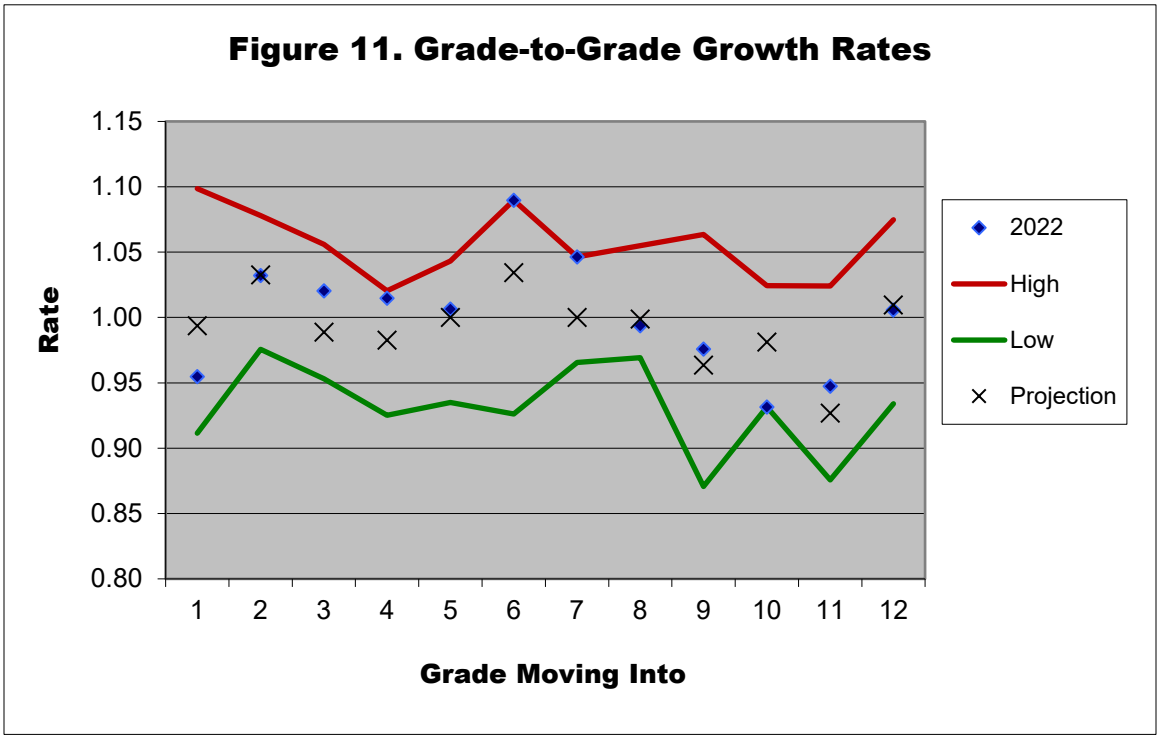
Year	Birth Year	Births	K	Re-tained from Prior Year	- - - - Non-Retained - - - - Born 5-Years Prior Colchester Resident	Non-Resident	Born 6 Yrs. Prior	Percent Retained	Yield From Births 5-Yrs Prior	Yield From Births 6-Yrs Prior	Total Yield From Birth Cohort
2012	2007	147	170	5	148	0	17	2.8%	100.7%	10.1%	113.6%
2013	2008	144	158	6	133	0	19	3.5%	92.4%	12.9%	104.2%
2014	2009	164	162	2	143	0	17	1.3%	87.2%	11.8%	99.4%
2015	2010	151	147	1	125	0	20	0.6%	82.8%	12.2%	94.0%
2016	2011	139	138	8	113	0	17	5.4%	81.3%	11.3%	91.4%
2017	2012	140	155	7	134	0	14	5.1%	95.7%	10.1%	106.4%
2018	2013	111	127	2	114	0	15	**1.3%**	**102.7%**	**10.7%**	116.2%
2019	2014	133	158	6	137	0	15	**4.7%**	**103.0%**	**13.5%**	115.8%
2020	2015	127	142	3	122	0	17	**1.9%**	96.1%	**12.8%**	113.4%
2021	2016	161	199	10	167	0	22	7.0%	**103.7%**	17.3%	115.5%
2022	2017	144	174	5	150	0	19	**2.5%**	**104.2%**	**11.8%**	*116.3%*
3-Year Average								3.6%	101.6%	13.8%	115.1%
5-Year Average								3.3%	102.1%	13.1%	115.4%
Covid-19 Adjusted								**2.5%**	**103.5%**	**12.1%**	**115.6%**
9-Year Median								2.5%	96.1%	11.8%	113.4%

The correlation between births and kindergarten enrollment five-year later was a high 0.94 over the 2005 to 2022 period. If this relationship were used to predict kindergarten enrollment, the estimate would have been off by an average of 10 children annually over the past ten years. The cohort survival method, with my breakout into five-year olds, six-year-old delayed entrants and children retained, can reasonably project kindergarten enrollment from earlier births in your town.

The “Connecticut Early Childhood Report on Changing the Kindergarten Date,” mandated by Public Act 14-39, recommended that the start date for kindergarten be moved back to October 1st phased in one month increments over the course of three years. It further recommended the elimination of the section of C.G.S Sec. 10-184 which allows parents the option of not enrolling their age-eligible child. Funds for the implementation have not yet been made available by the General Assembly. This common-sense change has yet to be implemented. If implemented, the changes will very slightly decrease the size of your

kindergarten class for three years and increase your pre-kindergarten enrollment. This change is not built into this projection, but will be built into future projections.

Figure 11 gives a perspective of the grade-to-grade growth rates for resident students attending the Colchester schools. An "x" indicates the average growth rate used in the projection. The diamond is the growth observed between last year and this year. The upper line indicates the largest growth rate observed over the past ten years and the lower line, the smallest. For example, in grade 2 the projection used a growth multiplier of 1.032 over the prior year's 1st grade enrollment. Over the past ten years, the rate ranged from a low of 0.976 to a high of 1.078. In general, the narrower the gap between the two lines is, the greater the accuracy of the projection. The K-5 growth rates used in the projection were based on the averages of the observed grade-to-grade growth from 2018, 19, and 22 with no adjustment for students home-schooled. The high school growth rates were based on five-year averages. The Grade 9 rates are for residents only.



Most model growth rates were in the middle to the upper end of the ten-year range. Grades 1 and 11 were the exceptions. The 2022 rates were well above the projection growth rates in grades 3 ,4 and 6 and 7 and well below in grades 1 and 10. The 2022 rates set ten-year highs in grades 6 and 7 and a ten-year low in grade 10. Four of the eight elementary growth rates are above 1.000, indicating a balance between in- and out-migration. The low rate in grade 9 reflects other opportunities such as technical high schools and agriscience programs. The low rate in grade 11 usually reflects drop-outs. The model growth rates in grades 2-12 averaged 0.993. The comparable rate for 2022 was 1.006. The 20-year median of those annual grade-to-grade rates was 0.998

Context of the Projection

The cohort-survival method typically needs only births and a few years of recent enrollment data to generate a projection. Mathematically, nothing else matters. But enrollment changes do not occur in a vacuum. Events and policies in the district, community and region all have some bearing on enrollment. Remember that a basic assumption of the cohort-survival method is that the recent past can be a good predictor of the near future. It is incumbent for every receiver of a projection to determine what events happened in the past few years and whether they are likely to change.

To assist in this endeavor, this report examines several factors that could affect enrollment: town population; women of child-bearing age; the labor force; new home construction; sales of existing homes; grade 9 retention; high school dropout rate; non-public enrollment; non-resident enrollment in Colchester schools; resident enrollment in other public schools and migration of families with school-age children.

Figure 12 presents the US Census Bureau's growth for Colchester between April, 2010 and 2020. In that period, the population declined by 513 people. Colchester's population loss of 3.19 percent ranked it 119th in the state. In contrast, New London County fell by 2.01 percent, the state grew by 0.89 percent and communities with similar economic and need characteristics (DRG D) grew by 0.69 percent. The Bureau estimates that Colchester's population grew 0.14 percent between July 2020 and July 2021. That growth ranked 75th in the state. The state grew by 0.15 percent, New London County grew by 0.21 percent and similar communities (DRG D) grew by 0.26 percent.

Figure 12. Town Population Growth, 2010 to 2020

Figure 13 presents the Connecticut State Data Center's 2017 population projections for Colchester residents 0-19 years of age in the years 2020, 2025 and 2030. They projected that the population ages 0-4 would increase 15.6 percent between 2020 and 2030. They also projected the population ages 5-9 would fall from 824 in 2020 to 790 (-4.1 percent) in 2030 and then rebound to 864 in 2030. They projected that number of children ages 10-14 would decline sharply from 1,011 in 2020 to 840 (-16.9 percent) in 2030. The number of youth ages 15-19 was projected to decline from 1,136 in 2020 to 804 in 2030 (-29.2 percent). This independent projection forecasts a steeper decline than the projection in this report.

Figure 13. Projected Colchester Population Ages 0-19

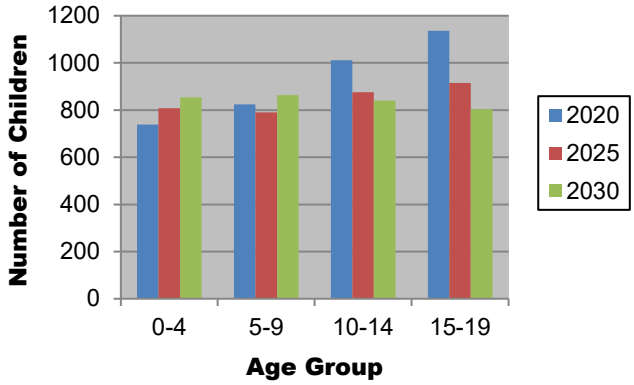


Figure 14 presents the Connecticut State Data Center's 2017 projections of the number of women of child-bearing age in Colchester from 2015 to 2025. The Center projected a 3.6 percent decline in the number of Colchester women ages 15-44 between 2020 and 2025. However, in communities like yours, 30-34-year-old women have the highest rate of births. The Center projected that the number of women in that group would grow from 443 in 2022 to 464 (+9.2 percent) in 2025. The second highest birth rate in communities like Colchester is women ages 25-29. The Center projected that the number in that age range would grow from 434 in 2020 to 464 (+6.9 percent) in 2025.

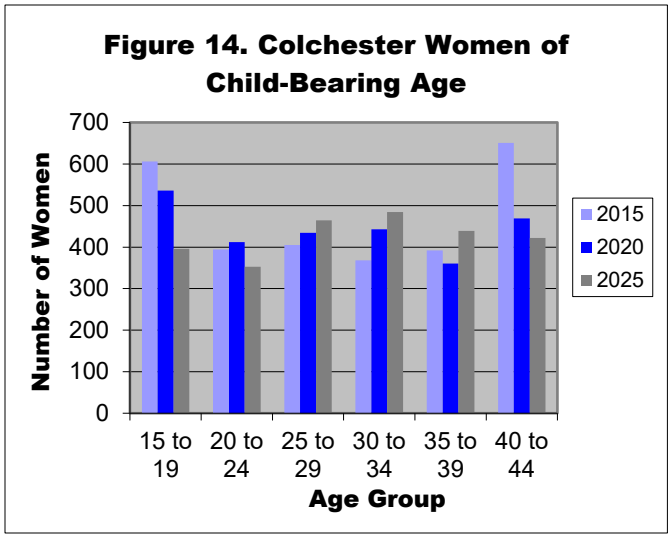


Figure 15 examines the number of people in the labor force from the US Department of Labor, Bureau of Labor Statistics. These are people 16 years of age or older who were working or actively were seeking employment. The Colchester labor force decreased between 2011 and 2013 and then rebounded through 2019. Covid-19 dropped the labor force to below the 2011 count in 2021. Between 2011 and 2021, the net decrease was 4.2 percent. This was worse than the state (-3.1 percent) but better than New London County (-9.5 percent). Colchester's unemployment rate of 4.8 percent in 2021 was 1.3 percentage points lower than 2020. It is better than the state rate of 6.3 percent and the New London County rate of 6.9 percent.

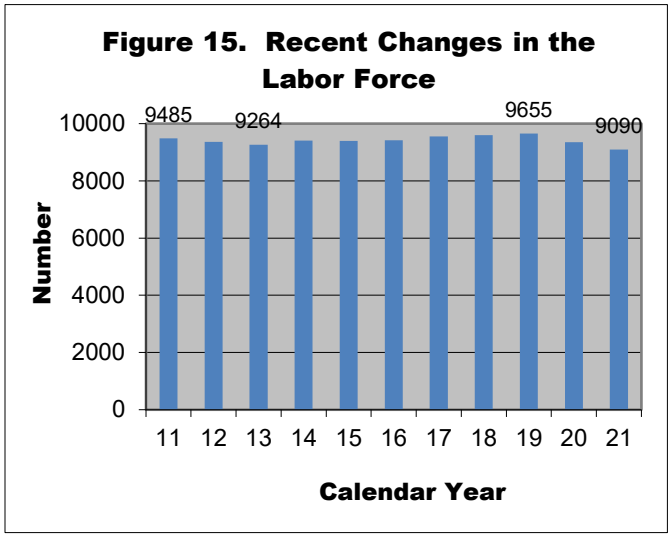


Figure 16 presents the net new housing permits issued from 2011 to 2021 from the State Department of Economic and Community Development. In the past ten years the number of net (of demolitions) new housing permits issued in Colchester ranged from a low of 12 in 2019 to a high of 63 in 2016. There were 17 permits issued in 2021. In the 2018-2021 period, there was an average of 19 net new housing permits issued.

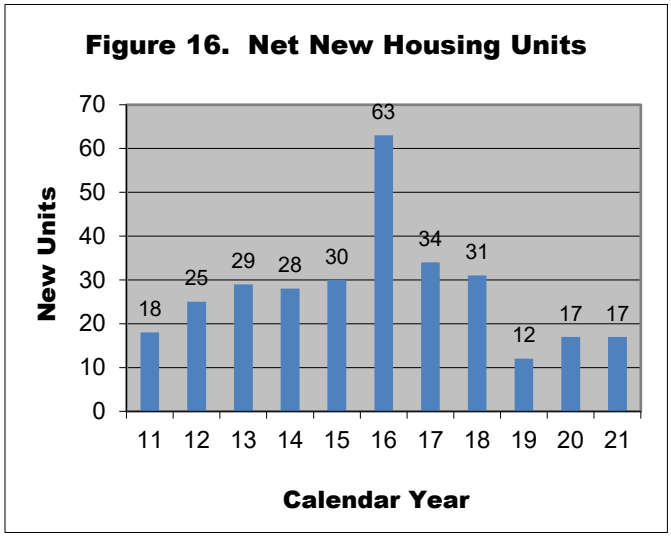


Figure 17 presents my estimate of the number of sales of existing single-family homes and condominiums. I derived it by taking the number of appropriate sales from The Warren Group/Commercial Record and subtracting the number of new single-family housing units authorized the prior year. The estimated number of sales of existing homes ranged from a low of 106 in 2012 to a high of 226 in 2021 From sales through November, I estimate there will be 202 sales in 2022. In the 2018-2022 period, there was an average of 203 sales annually.

Figure 17. Sales of Existing Single-Family Homes and Condominiums

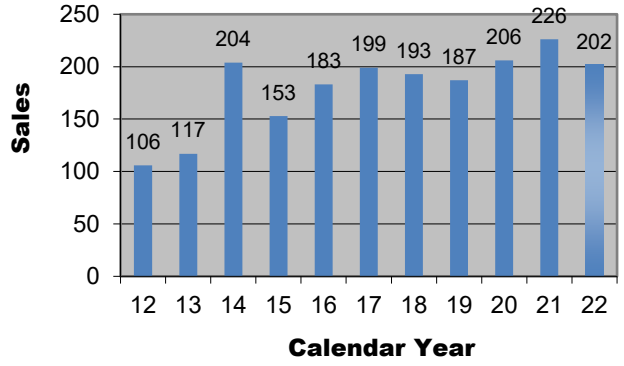


Figure 18 presents the percentage of grade 9 students who were classified as 9th graders for a second year. Colchester appears to have revised the number of credits needed to be considered a 10th grade student in the 2017-18 school year. Over the past six years the percentage of students classified as 9th graders for a second year grew from 1.0 percent in 2017 to 10.5 percent in 2020 and was 9.8 percent in 2022. Over the past five years, the enrollment in grade 9 was inflated by 13 students and the enrollment in 10th grade was deflated by that figure. Between 2018 and 2022 an average 7.0 percent of 9th graders were classified in the grade for a second year.

Figure 18. Repeaters of Grade 9

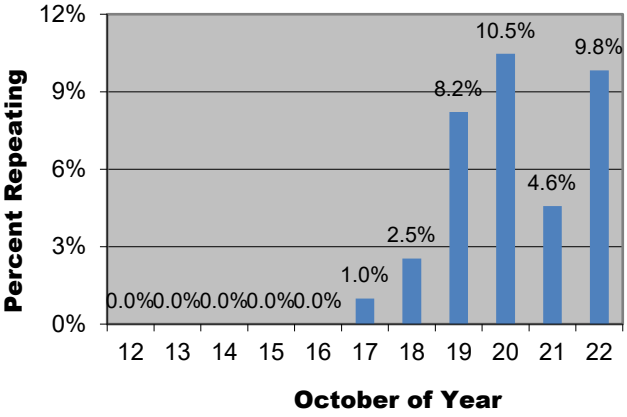


Figure 19 shows the annual percentage of dropouts from grades 9-12 for the 2011-12 to 2021-22 school years. The data were obtained from the Connecticut State Department of Education and the Colchester Central Office. Dropouts are students who left school early, left to enroll in a GED program, transfer to post-secondary education prior to graduation or moved but not known to be continuing. Over the five years between 2018 and 2022, the average rate was 0.9 percent. The high 2021 rate was due, in part, to students' failure to maintain an on-line presence.

Figure 19. Annual High School Dropout Rate

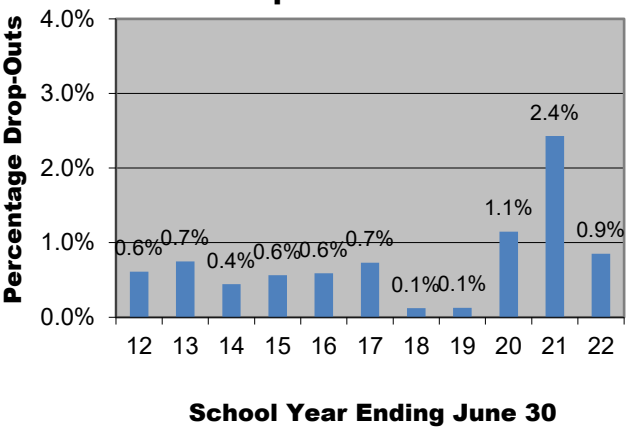


Figure 20 presents the non-public enrollment over the past ten years for students from the town of Colchester. The data are from the records of the Connecticut State Department of Education. Non-public enrollment declined from 141 students in 2012 to 57 students in 2021 and then rebounded to 61 in 2022. In the past ten years, enrollment in the non-public schools declined by 70 students or about 53 percent. The 2022 non-public enrollment represented 2.6 percent of all students from Colchester. Ten years ago, the figure was 4.2 percent. I project that non-public enrollment from Colchester will be about 65 students in 2023.

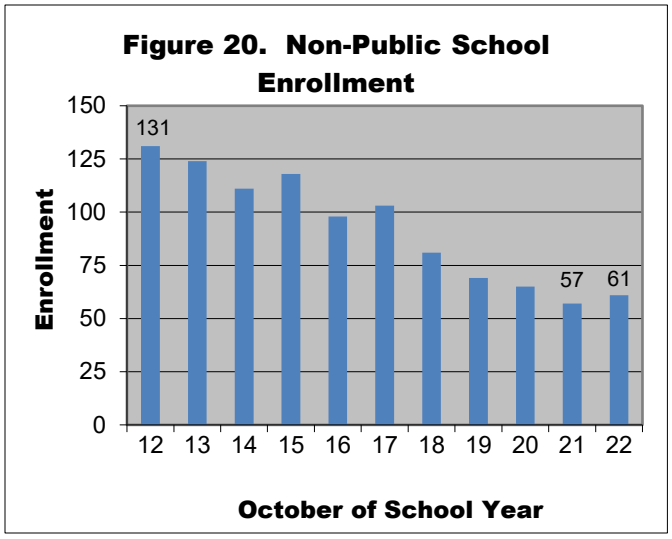


Figure 21 presents the enrollment of Colchester residents in other public schools in Connecticut from October, 2012 to 2022. The number educated out-of-district rose from 118 in 2012 to 198 in 2016 and then plummeted to 105 in 2022. The number enrolled in magnet or charter schools rose from 55 students in 2012 to 118 in 2016 and then fell to 30 in 2022. In 2022, 30 students attended a magnet or charter school, 15 attended the agriculture science program at Lyman Memorial High, 49 attended a State Technical High School, and 11 attended a special education program run by a RESC or another public-school district.

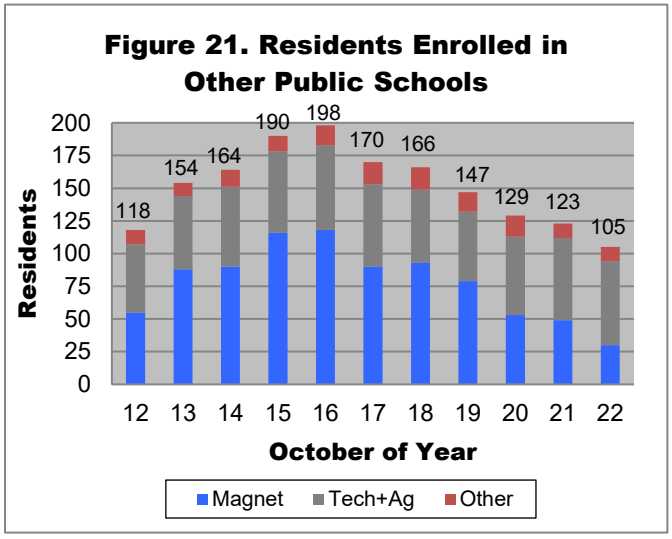


Figure 22 presents the number of non-residents, most from Norwich, who attended Bacon Academy on a tuition basis. The option started with eight students enrolled in 2016. The number grew to 33 in 2021 and was 31 in 2022. These students represented 4.6 percent of the Bacon Academy enrollment in 2022. The projection assumes ten non-residents will enroll in Colchester grade 9 annually. Over the next ten years, these tuition students from Norwich are projected to average 4.9 percent of Bacon Academy enrollment.

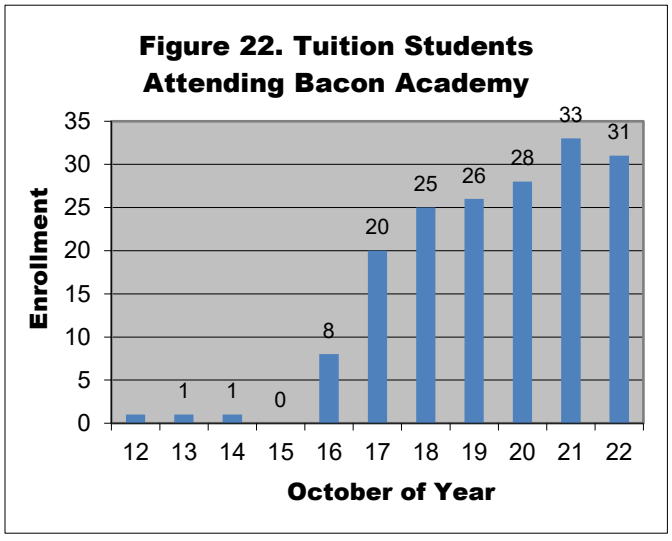
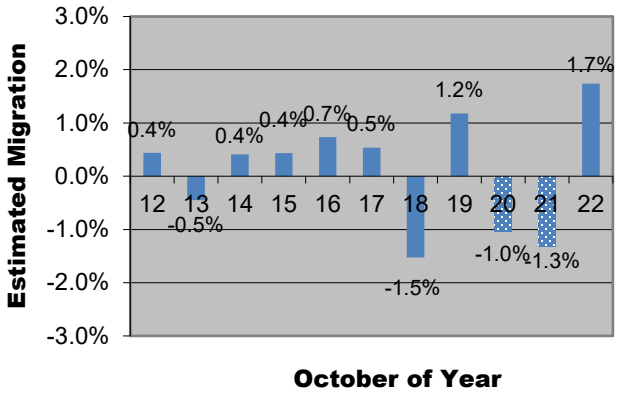


Figure 23 presents my estimate of the migration of families with school-age children. I based it on Colchester resident enrollment in grades 1-8 in all public and non-public schools in Connecticut. The estimate in 2020 and 2021 was adjusted for students withdrawing to become home-schooled. Estimated family migration ranged from a low of -1.5 percent in 2018 to a high of +1.7 percent in 2022. In the 2018, 19 and 22, there was an average family migration of +0.5 percent. The median over the past 10 years was +0.4 percent.

Figure 23. Estimated Migration of Families with School-Age Children

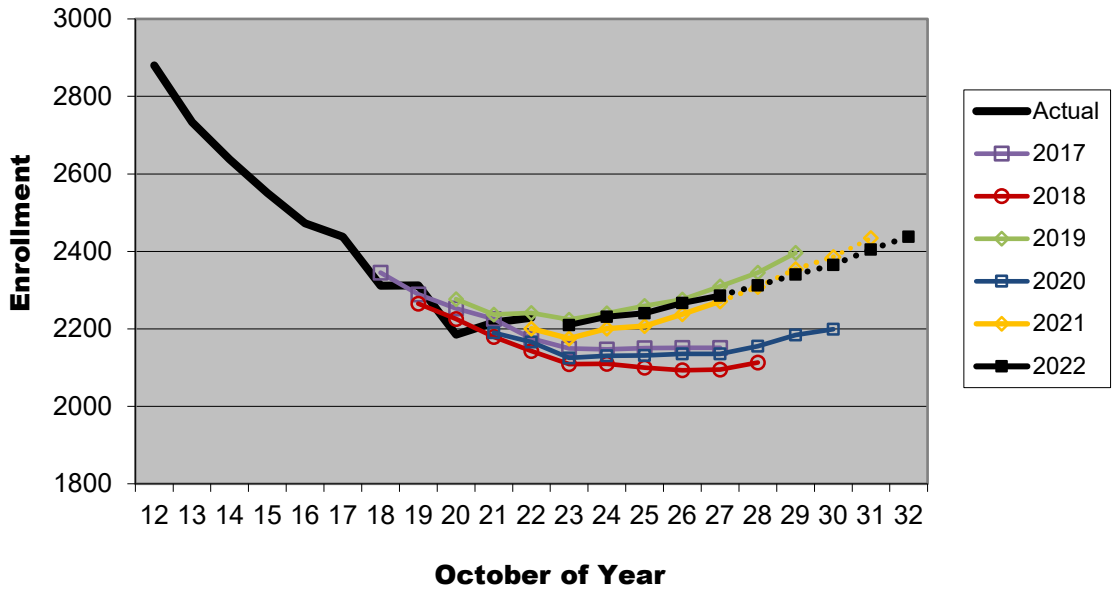


Prior Projections of Enrollment

The cohort-survival projection method works by moving forward the pattern of recent events that are subsumed within the grade-by-grade enrollment. This works very well when communities are stable. One way to know if that assumption is valid is to examine how past projections have fared. Figure 24 presents the enrollment projections that I have run for Colchester since 2017. The five enrollment projections that I did between 2012 and 2021 had one-year error rates that averaged 2.0 percent. The one projection done between 2012 and 2017 had a five-year error rate of 2.4 percent, which is 0.5 percent annualized.

Last year's projection is running 1.3 percent low. In that analysis, I projected that K-2 enrollment would be 543 students in 2022. The actual enrollment of 525 was 18 students less than projected. The projection was high by 3.4 percent. I projected that enrollment in grades 3-5 would be 436 students in 2022. The actual enrollment of 444 was eight students more than projected. The projection was low by 1.8 percent. I projected that this year's enrollment at William J. Johnson Middle School would be 465 students. The actual enrollment of 477 was 12 students more than projected. The projection was low by 2.5 percent. I projected that this fall's high school enrollment would be 662 students. The actual enrollment of 676 was 14 students more than projected. The projection was low by 2.1 percent. The 2021 projection expected a pre-kindergarten enrollment of 95 children. There were 107 enrolled in 2022.

Figure 24. Prior Projections of Enrollment



Over the past forty years, I have found the cohort-survival method provides estimates that are sufficiently accurate for intermediate-range policy planning. The eight-year planning horizon for school construction grants is at the limit of the useful accuracy of the method. The method usually does not attempt to predict the future. Its key assumption is that the near future will be like the recent past. For example, projections done in the late 2000s did not anticipate the recession of 2012. Some policy changes such as kindergarten retention, drop-out prevention programs and the number of credits to be considered a 10th grader can be built into a new projection. It is incumbent upon the receiver of a projection to identify planned changes so that they can be built into a projection.

Summary

I project that total enrollment in 2032 could grow by almost 210 students, an increase of 9.4 percent over 2022. That would bring total enrollment to about 2,440 students. I project that Colchester Elementary School enrollment could move upward from 632 students in 2022 to 660 students in 2032. This would be about a 30-student gain, a growth over four percent. I expect the Jack Jackter School enrollment could increase from 444 students in 2022 to about 530 students in 2032. I believe that future enrollment at the William J. Johnson Middle School could decline to about 455 students somewhere between 2025 and 2026 and be close to 570 students in 2032. That would be over a 19 percent increase over 2022. The peak enrollment at Bacon Academy was 1,003 students in 2009. Between 2023 and 2028, enrollment at the Academy could fall from 676 students to about 600 students. By 2032, I anticipate it will be close to 680 students. That would represent a net gain of about five students, an increase of one percent.

This report is projecting an increase in enrollment in grades K-8 and a slight decline in high school enrollments. It is critical to remember that a projection is just a moving forward of recent trends. Are the past few years reasonable to project forward? In the five years from 2013 to 2017 (this fall's kindergarten through 4th graders) births averaged 135. Births in the 2018 through 2022 period will average close to 148. My model assumes that births in 2023 to 2027 will average 153. That alone should pull elementary enrollment upward. Covid-19 impacted kindergarten enrollment the most in 2020 and 2021. After several adjustments, I projected future kindergarten from 103.5 percent of births five years prior, 12.1 percent of births six-years prior and 2.5 percent of kindergartners retained. The average of the grade-to grade growth rates across grades 2-12 that I used to grow future enrollment was 0.993. These projection multipliers averaged 1.006 in 2022; the median over the last 20 years was 0.998. Taking these three key factors into consideration, I believe the projection is realistic.

These projections are based upon several other assumptions revolving around the notion that the recent past is a good predictor of the near future. The projection assumes that the following school policies will continue: kindergarten will remain full-day; about 12 percent of parents will delay their child's kindergarten entry until age six; ten Norwich children will enroll in grade 9 annually, retention policies will not change; no expansion of enrollment in area magnets and no change in the dropout rate or the recent change in the number of credits required to move from grade 9 to 10. The projection assumes a migration of families with school-age children of +0.5 percent; a very slight decline in non-public school enrollment; 19 new housing units will be constructed annually; an average of 203 sales of existing single-family homes and condominiums and little change in the labor force.

Obviously Covid-19 introduced some uncertainty into this projection. I assumed that the epidemic's impact on enrollment is now behind us. I did not adjust recent growth rates for students withdrawing to be home-schooled and then returning. Rather I was selective in which rates I used. There is a lot more going on now than in my standard projections. The change in the number of credits required to move from grade 9 to 10 is now pretty much built into the high school's projection. What isn't built in is the possible impact of increased interest rates on families with children being able to move into Colchester. A bit more caution than usual should be exercised when using these projections to make policy decisions.

It is important to remember that the cohort survival method relies on observed data from the recent past. Its key assumption is that those conditions will persist. It does not try to predict when the economic conditions might change. We cannot know today how long these conditions will continue. This projection should be used as a starting point for local planning. Examine the factors and assumptions underlying the method. You know your community best. Apply your knowledge of the specific conditions in Colchester and then make adjustments as necessary.

Appendix A. Colchester Enrollment Projected by Grade to 2032: Primary and Intermediate Grades

October 1 of Year	Birth Year	Births[1]	K	1	2	3	4	5	PK	Total PK-2	Total 3-5
2012	2007	147	170	171	195	222	198	210	76	612	630
2013	2008	144	158	164	170	196	220	198	59	551	614
2014	2009	164	162	161	160	168	200	217	59	542	585
2015	2010	151	147	171	161	163	165	203	91	570	531
2016	2011	139	138	141	171	170	162	166	53	503	498
2017	2012	140	155	144	152	174	170	169	92	543	513
2018	2013	111	127	160	149	151	161	170	97	533	482
2019	2014	133	158	128	165	142	154	160	104	555	456
2020	2015	127	142	144	131	159	142	144	81	498	445
2021	2016	161	199	156	147	136	155	145	97	599	436
2022	2017	144	174	190	161	150	138	156	107	632	444
Projected											
2023	2018	135	161	173	196	159	147	138	109	639	444
2024	2019	159	185	160	179	194	156	147	114	638	497
2025	2020	138	167	184	165	177	191	156	113	629	524
2026	2021	173	200	166	190	163	174	191	105	661	528
2027	2022	136	167	199	171	188	160	174	111	648	522
2028	2023	151	177	166	205	169	185	160	112	660	514
2029	2024	153	181	176	171	203	166	185	112	640	554
2030	2025	153	181	180	182	169	199	166	112	655	534
2031	2026	153	181	180	186	180	166	199	112	659	545
2032	2027	153	181	180	186	184	177	166	112	659	527
Projection Growth Rates[2]				0.994	1.033	0.989	0.983	1.000	0.732		
Annual Growth Rates											
											Migration[3]
2013			1.097	0.965	0.994	1.005	0.991	1.000	0.375		-0.30%
2014			0.988	1.019	0.976	0.988	1.020	0.986	0.407		0.00%
2015			0.974	1.056	1.000	1.019	0.982	1.015	0.652		0.26%
2016			0.993	0.959	1.000	1.056	0.994	1.006	0.422		0.96%
2017			1.107	1.043	1.078	1.018	1.000	1.043	0.754		0.27%
2018			1.144	1.032	1.035	0.993	0.925	1.000	**0.746**		-1.77%
2019			1.188	1.008	1.031	0.953	1.020	0.994	**0.722**		0.30%
2020			1.118	0.911	1.023	0.964	1.000	0.935	0.531		-3.29%
2021			1.236	1.099	1.021	1.038	0.975	1.021	0.695		-0.32%
2022			1.208	0.955	1.032	1.020	1.015	1.006	**0.728**		1.75%
3-Year Ave.			1.192	0.982	1.026	1.005	0.995	0.987	0.511		
Weighted 3-Year			1.203	0.995	1.027	1.017	0.999	0.999	0.684		
5-Year Ave.			1.183	0.996	1.029	0.992	0.984	0.991	0.496		
10-Year Median			1.113	1.013	1.022	1.011	0.997	1.003	0.674		
2018, 19, 22			1.183	**0.994**	**1.033**	**0.989**	**0.983**	**1.000**	**0.682**		

[1] 2007-2021 births are from the State Department of Public Health. The 2021 count is provisional. The 2022 births were based on in-state births through September. Births in 2023-2027 were based on the Connecticut State Data Center's 2017 projection of Colchester women of child-bearing ages and my estimate of 2020 fertility rates in Colchester.

[2] Growth rates based on grade-to-grade rates from 2018, 19 and 22. Kindergarten based on the average of repeaters in 2018, 2019, 2020 and 2022, the average of kindergartners from births five-years prior from 2018, 2019, 2021 and 2022 and the average of kindergartners from births six-years prior from 2018, 2019, 2010 and 2022.

[3] Estimated by comparing the enrollment in grades 3-8 one year with the enrollment in grades 2-7 the prior year with an adjustment for residents out and non-residents in.

Appendix B. Colchester Enrollment Projected by Grade to 2032: Middle and High School Grades

October 1 of Year	6	7	8	9	10	11	12	6-8 Total	9-12 Total	District Total
2012	229	245	227	205	221	248	263	701	937	2,880
2013	197	230	241	205	208	224	263	668	900	2,733
2014	198	195	232	226	210	213	237	625	886	2,638
2015	213	198	189	202	219	204	225	600	850	2,551
2016	188	216	201	187	199	220	214	605	820	2,426
2017	165	193	213	203	185	197	226	571	811	2,438
2018	167	164	189	197	209	174	196	520	776	2,311
2019	174	170	173	207	194	196	187	517	784	2,312
2020	165	168	168	172	199	179	191	501	741	2,185
2021	151	162	165	175	171	177	180	478	703	2,216
2022	158	158	161	173	163	162	178	477	676	2,229
Projected										
2023	161	158	158	165	170	151	164	477	650	2,210
2024	143	161	158	162	162	158	152	462	634	2,231
2025	152	143	161	162	159	150	160	456	631	2,240
2026	161	152	143	165	159	147	151	456	622	2,267
2027	198	161	152	148	162	147	148	511	605	2,286
2028	180	198	161	156	145	150	148	539	599	2,312
2029	165	180	198	165	153	134	151	543	603	2,340
2030	191	165	180	201	162	142	135	536	640	2,365
2031	172	191	165	183	197	150	143	528	673	2,405
2032	206	172	191	169	180	183	151	569	683	2,438
Projection Growth Rates	1.034	1.000	0.999	0.964	0.981	0.927	1.010			
Annual Growth Rates[1]										**Estimated Migration[2]**
2013	0.938	1.004	0.984	0.903	1.015	1.014	1.060			-0.30%
2014	1.000	0.990	1.009	0.938	1.024	1.024	1.058			0.00%
2015	0.982	1.000	0.969	0.871	0.969	0.971	1.056			0.26%
2016	0.926	1.014	1.015	0.952	0.985	1.005	1.049			0.96%
2017	0.994	1.027	0.986	0.950	0.989	0.990	1.027			0.27%
2018	0.988	0.994	0.979	0.887	1.030	0.941	0.995			-1.77%
2019	1.024	1.018	1.055	1.063	0.985	0.938	1.075			0.30%
2020	1.031	0.966	0.988	0.942	0.961	0.923	0.974			-3.29%
2021	1.049	0.982	0.982	0.958	0.994	0.889	1.006			-0.32%
2022	1.090	1.046	0.994	0.976	0.931	0.947	1.006			1.75%
3-Year Ave.	1.056	0.996	0.988	0.958	0.962	0.918	0.995			
Weighted 3-Year	1.066	1.011	0.989	0.964	0.957	0.924	1.000			
5-Year Ave.	**1.034**	**1.000**	**0.999**	**0.964**	**0.981**	**0.927**	**1.010**			
10-Year Median	0.997	1.002	0.987	0.946	0.978	0.951	1.027			
2018, 19, 22	1.031	1.019	1.008	0.972	0.984	0.942	1.024			

[1] Annual growth rates in grade 9 based on residents only. The projection assumes 10 non-residents will enroll in grade 9 annually.

[2] Estimated by comparing the enrollment in grades 3-8 one year with the enrollment in grades 2-7 the prior year with adjustments for residents out and non-residents in.