

MEMORANDUM

January 5, 2009

TO: William Ryan
Superintendent of Schools

FROM: Peter K. Ashton and Mary Ann Ashton

SUBJ: APS and ABRSD Enrollment Projections

At your request, we have reviewed the October 2008 enrollment data, and we have updated the enrollment forecasts for ABRSD and APS based on these new data as well as new data on births and housing starts in each community and other demographic and building trends. This memo presents our annual update to the enrollment projections model developed several years ago. This year we have modified the model slightly to make it consistent with the model we are producing for the Massachusetts School Building Authority (MSBA) for all school districts in the commonwealth. The following are a few observations based on these new data and forecasts.

2008 Enrollment vs. 2007 Enrollment

- At the local level, 2008 enrollment declined by 27 students relative to 2007 and is down 70 students from the peak in 2004. Actual enrollment at grades 2, 3, 4 and 6 declined, including a very significant decline of 40 students at grade 3. Increases were observed at kindergarten, 1st and 5th grades. The 5th grade remains the largest class in the Acton elementary schools. For the fourth straight year, kindergarten enrollment remained below 310 students despite an increase of 9 students over the prior year's kindergarten. Average enrollment in grades K through 2 is only 321 students compared with grades 3 through 6 which averages 380 students. These lower grade sizes may be expected to flow through grades 3 through 6 in the next few years.
- Enrollment at the Junior High School increased by 4.5 percent (43 students) compared with last year. The 7th grade increased by 16 students and the 8th grade experienced an increase of 27 students relative to 2007 enrollment.
- At the High School, enrollment was essentially flat compared with last year (net increase of one student). However, grades 9 and 11 decreased by 35 and 30 students respectively compared with 2007 enrollment, while grade 10 increased by 60 students and grade 12 increased by one student. Total enrollment at the region increased by 1.5 percent or 44 students. Boxborough's share of enrollment now accounts for 20.8 percent of the total at the region which is a slight decline from last year.

- Total Acton school enrollment (K-12) is now 4,773 students, an increase of 11 students over last year (or .002 percent). The rate of growth in enrollment has clearly moderated, and as discussed below there are clear signs that enrollment will decline in the foreseeable future, especially at the elementary level.

2008 Enrollment vs. Prior Projections

- Across all grade levels, last year's projection for 2008 was generally slightly below this year's actual total by a total of 40 students. This is an error rate of 0.74 percent across all grades. However, grade to grade variations were in some cases quite substantial, especially at kindergarten (25 more than projected), 1st grade (24 more than projected), 4th grade (15 fewer than projected), and 8th grade (13 more than projected). Even at the elementary level, however, the error rate was only 1.1 percent.
- At the Junior High, 7th grade enrollment matched the projection (within one student) but the 8th grade had 13 more students than expected.
- At the High School overall enrollment matched the projection (within one student). Overall at the region, the error rate in our projections was 0.44 percent relative to the 2007 forecast.

Updated Enrollment Projection

We have updated the enrollment projections for Acton K-6, Boxborough K-6 and for the region grades 7-12, based on the new enrollment data, as well as additional data on housing starts, planned housing developments, births, household size, and population projections. To be consistent with our modeling effort for the MSBA, we used five year averages for grade to grade ratios for both communities (as was used last year). Both communities continue to show less new construction and less housing turnover than recent years.

In developing the updated projections, a number of interesting trends became apparent:

- The grade to grade ratios remain quite stable, especially at the Acton elementary level. Figure 1 shows the trend in the birth to kindergarten ratio in each community. This ratio is considerably more volatile than the grade to grade ratio. Acton's birth to kindergarten ratio has been declining, although it did increase slightly in 2007. In Boxborough this ratio has been more volatile, although in the last four years, it has been relatively stable.
- Figure 2 shows that the number of new building permits in Acton has fallen significantly in recent years. In Boxborough, permits for new housing units have also been declining since 2002, and are less than the number in Acton. These figures are

down significantly from the peak years of the early to mid 1990s. This is a reflection of both the economic downturn and the fact that Acton is nearing buildout.

- The birth trend in Acton and Boxborough continues to decline. Figure 3 presents births by year and shows a significant decline in Acton starting in 2002 and continuing in each of the next five years.¹ Acton is now clearly showing signs of reverting to a birth rate more in line with the 1980s, which if it continues, will lead to a significant decline in enrollment over the next 10-15 years. Boxborough's birth rate has also declined slightly in recent years. Census data and MAPC projections confirm a general aging of the female childbearing population which supports the belief that this decline in births should continue in the future.
- The updated enrollment projections are shown in Tables 1 through 4 and indicate that the peak period of enrollment at the region extends between 2010 and 2012, a slightly more compacted window than was projected last year. In each of these years, enrollment at the region exceeds 2,900 students. At the junior high, the peak year is 2008 at 1,001 students and then enrollment begins to decline. At the high school the peak year is 2010 with 1,988 children. In both cases, these peaks arrive sooner than what was projected last year.
- At the elementary level, Acton's enrollment continues to decline overall, despite larger than expected enrollments in kindergarten and first grade for this year.
- Although the enrollment forecast extends through 2020, the degree of accuracy is considerably greater for the years in which students are already in the system, i.e., in kindergarten or higher. Thus, for the region, the predictions through 2014 are likely to be more accurate than for later years and at the elementary level, predictions past 2012 are less likely to be accurate.²

¹ The data for 2007 and 2008 must be viewed as being preliminary as they are based on town data not MDPH data. These two data sets do track reasonably well over time, however, and we have corrected for the towns' general propensity to underreport the number of births due to reporting lags.

² This is because the forecasts must predict both births and the relationship between births and kindergarten enrollment as well as grade to grade movements. Forecasting births is inherently less reliable than forecasting cohorts already in the population.

Figure 1
Comparison of Birth to Kindergarten Ratios

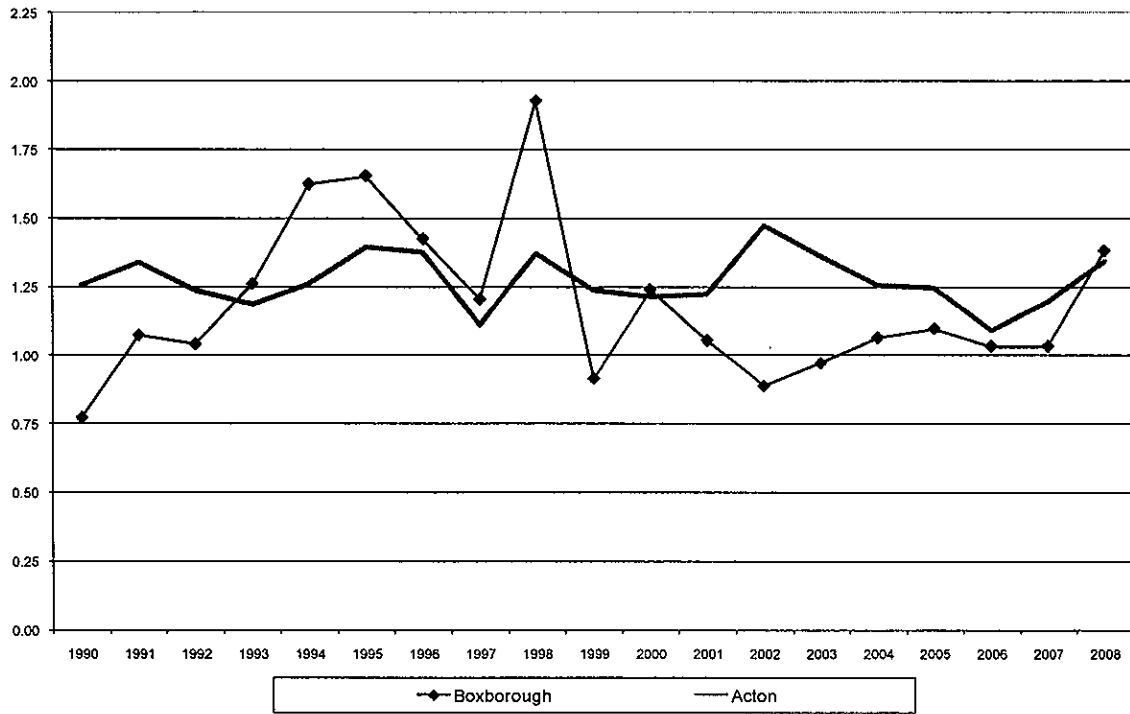


Figure 2
Building Permits by Town
1980-2007*

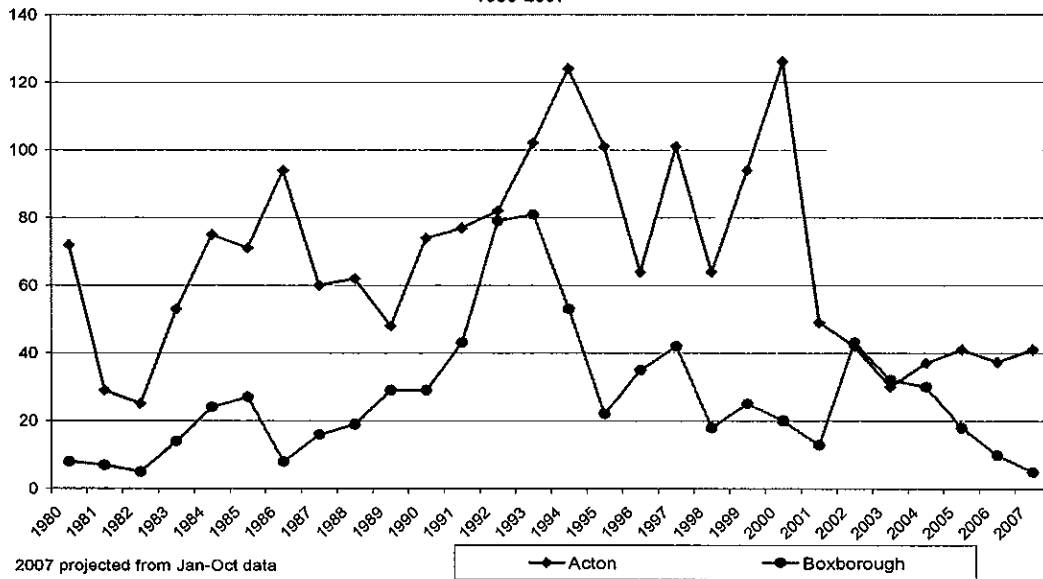


Figure 3
Births in Acton and Boxborough
 1980-2008

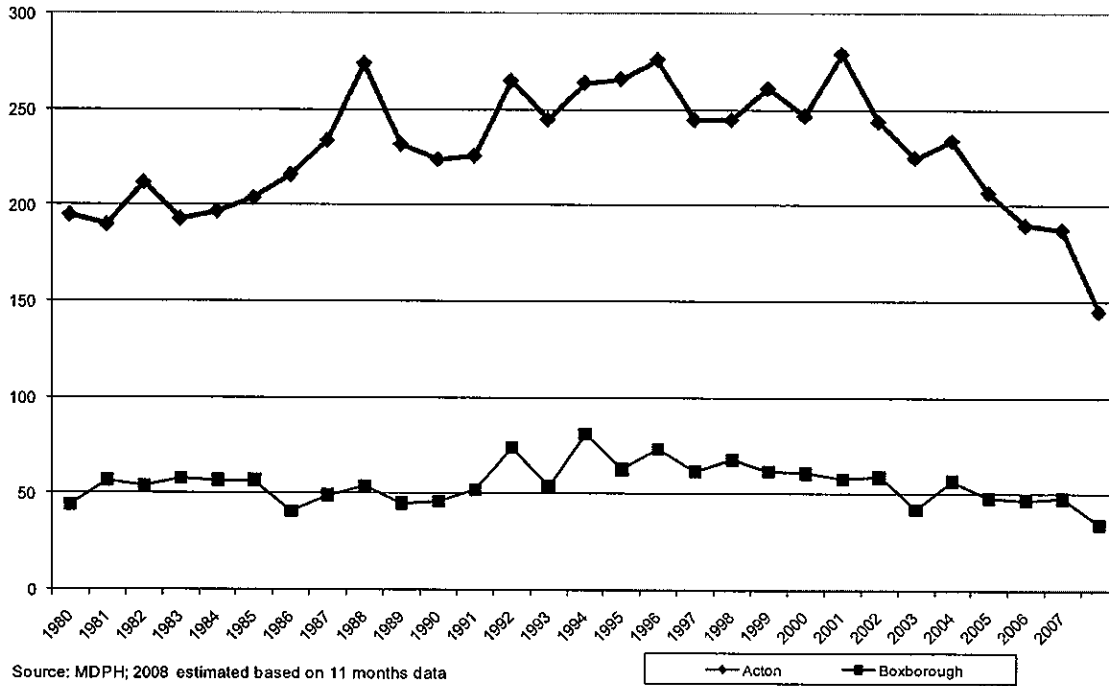


Table 1
Revised Enrollment Projections - 12/08

PUBLIC SCHOOL ENROLLMENT PROJECTIONS									
Elementary School									
Acton, MA: 1998-2020									
Year	K-12	K	1	2	3	4	5	6	Total
1999*	4,096	326	353	318	359	346	346	324	2,372
2000*	4,215	323	346	358	332	362	359	344	2,424
2001*	4,307	338	345	351	360	335	364	367	2,460
2002*	4,450	361	361	350	353	357	343	381	2,506
2003*	4,517	334	348	369	360	355	365	349	2,480
2004*	4,575	328	352	363	376	365	361	379	2,524
2005*	4,654	308	352	359	372	380	375	370	2,516
2006*	4,712	305	315	371	375	375	387	390	2,518
2007*	4,762	292	320	340	389	394	382	397	2,514
2008*	4,773	301	326	336	349	381	404	384	2,481
2009	4,772	287	320	342	347	353	389	415	2,454
2010	4,762	254	305	336	353	351	361	400	2,360
2011	4,678	238	270	320	347	358	359	371	2,262
2012	4,589	227	253	283	331	351	365	368	2,179
2013	4,425	176	241	266	293	335	359	375	2,044
2014	4,294	211	187	253	274	296	342	368	1,932
2015	4,159	200	225	196	262	278	303	351	1,814
2016	3,996	205	213	236	202	265	284	311	1,716
2017	3,852	210	218	224	243	205	271	291	1,662
2018	3,740	215	223	229	231	246	209	278	1,632
2019	3,728	220	228	234	236	234	252	215	1,619
2020	3,692	225	234	240	242	239	239	259	1,677

PUBLIC SCHOOL ENROLLMENT PROJECTIONS			
Junior School			
Acton, MA: 1998-2019			
Year	7	8	Total
1999*	341	345	686
2000*	315	345	660
2001*	335	333	668
2002*	352	348	700
2003*	375	354	729
2004*	351	368	719
2005*	391	351	742
2006*	382	400	782
2007*	395	381	776
2008*	402	407	809
2009	391	405	796
2010	423	394	817
2011	407	425	833
2012	378	410	787
2013	375	380	756
2014	382	378	760
2015	375	385	760
2016	358	378	736
2017	317	360	677
2018	297	319	616
2019	283	299	582
2020	219	285	504

PUBLIC SCHOOL ENROLLMENT PROJECTIONS					
High School					
Acton, MA: 1998-2019					
Year	9	10	11	12	Total
1999*	282	253	265	238	1038
2000*	329	277	260	265	1131
2001*	323	324	276	256	1179
2002*	325	320	322	277	1244
2003*	343	328	315	322	1308
2004*	362	338	332	300	1332
2005*	368	361	341	326	1396
2006*	345	364	369	334	1412
2007*	391	345	366	370	1472
2008*	385	394	342	362	1483
2009	406	383	397	336	1523
2010	404	405	386	390	1585
2011	393	402	408	379	1583
2012	425	392	406	400	1623
2013	409	423	395	398	1625
2014	380	408	427	387	1601
2015	377	378	411	419	1585
2016	384	376	381	403	1544
2017	377	383	379	374	1513
2018	360	376	386	372	1493
2019	318	358	379	378	1434
2020	298	317	361	371	1348

Excludes choice
* Actual data

Sources: Acton-Boxborough School System
Acton Town Clerk & Building Commissioner
Mass. Department of Public Health

NOTE: This scenario is a result of utilizing 5 year averages for the kindergarten to births and grade to grade ratios.

Table 2
Revised Enrollment Projections - 12/08

PUBLIC SCHOOL ENROLLMENT PROJECTIONS									
Elementary School									
Boxborough, MA: 1998-2020									
Year	K-12	K	1	2	3	4	5	6	Total
1999*	1,029	74	106	94	85	93	90	102	644
2000*	1,067	78	81	105	91	83	94	93	625
2001*	1,109	77	83	85	105	94	89	100	633
2002*	1,113	55	82	87	82	109	95	89	599
2003*	1,146	66	68	91	87	86	108	95	601
2004*	1,151	66	70	74	98	79	85	109	581
2005*	1,152	67	74	67	75	96	84	88	551
2006*	1,130	60	67	76	68	76	95	87	529
2007*	1,134	61	71	76	78	73	83	95	537
2008*	1,082	58	57	72	71	71	74	78	481
2009	1,076	64	61	60	73	69	73	74	475
2010	1,042	54	68	64	60	71	71	73	462
2011	1,010	54	57	71	65	59	73	72	451
2012	958	52	57	60	72	64	61	74	438
2013	918	37	55	60	60	70	65	61	408
2014	897	51	39	57	60	59	72	66	405
2015	849	49	54	41	58	59	61	72	394
2016	823	53	52	57	42	57	61	61	382
2017	825	58	57	54	57	41	58	61	386
2018	820	62	61	59	55	56	42	58	394
2019	821	52	66	64	60	54	58	42	395
2020	841	66	55	69	65	58	55	58	426

PUBLIC SCHOOL ENROLLMENT PROJECTIONS			
Junior High			
Boxborough, MA: 1998-2020			
Year	7	8	Total
1999*	78	78	156
2000*	98	76	174
2001*	91	104	195
2002*	99	95	194
2003*	97	99	196
2004*	99	96	195
2005*	103	101	204
2006*	91	108	199
2007*	90	92	182
2008*	99	93	192
2009	80	101	181
2010	76	81	157
2011	75	77	152
2012	73	76	149
2013	75	75	150
2014	62	77	139
2015	67	63	130
2016	74	68	142
2017	62	75	138
2018	62	63	126
2019	60	63	123
2020	43	61	104

PUBLIC SCHOOL ENROLLMENT PROJECTIONS					
High School					
Boxborough, MA: 1998-2020					
Year	9	10	11	12	Total
1999*	67	65	50	47	229
2000*	78	72	64	54	268
2001*	70	79	65	67	281
2002*	100	73	79	68	320
2003*	97	100	74	78	349
2004*	97	102	101	75	375
2005*	103	91	101	102	397
2006*	100	104	96	98	398
2007*	116	100	106	97	419
2008*	87	116	100	106	409
2009	94	87	118	100	399
2010	102	94	88	118	403
2011	82	102	96	88	368
2012	78	82	104	96	360
2013	77	78	83	104	343
2014	76	77	79	83	316
2015	78	76	78	79	311
2016	64	78	77	79	297
2017	69	64	79	77	289
2018	76	69	65	79	289
2019	64	76	70	65	276
2020	64	64	77	70	276

Excludes choice
* Actual data

NOTE. This scenario is a result of utilizing 5 year average for grade to grade ratios and kindergarten to birth ratio
Sources: Acton-Boxborough School System
Boxborough Town Clerk & Town Planner
Mass. Department of Public Health

**Table 3
Regional Enrollment**

Year	JHS Boxborough	JHS Combined	SHS Boxborough	SHS Combined	Region Total	Boxborough Share
1999*	156	842	229	1267	2109	18.3%
2000*	174	834	268	1399	2233	19.8%
2001*	195	863	281	1460	2323	20.5%
2002*	194	894	320	1564	2458	20.9%
2003*	196	925	349	1657	2582	21.1%
2004*	195	914	375	1707	2621	21.7%
2005*	204	946	397	1793	2739	21.9%
2006*	199	981	398	1810	2791	21.4%
2007*	182	958	419	1891	2849	21.1%
2008*	192	1001	409	1892	2893	20.8%
2009	181	976	399	1922	2898	20.0%
2010	157	973	403	1988	2961	18.9%
2011	152	985	368	1951	2936	17.7%
2012	149	937	360	1982	2919	17.4%
2013	150	905	343	1968	2873	17.1%
2014	139	899	316	1917	2816	16.1%
2015	130	890	311	1896	2786	15.8%
2016	142	878	297	1841	2719	16.1%
2017	138	815	289	1801	2616	16.3%
2018	126	741	289	1782	2524	16.4%
2019	123	705	276	1710	2415	16.5%
2020	104	607	276	1624	2232	17.0%

Supplemental Figures

Figure 4
Acton Public Schools Enrollment
Kindergarten through Grade 6

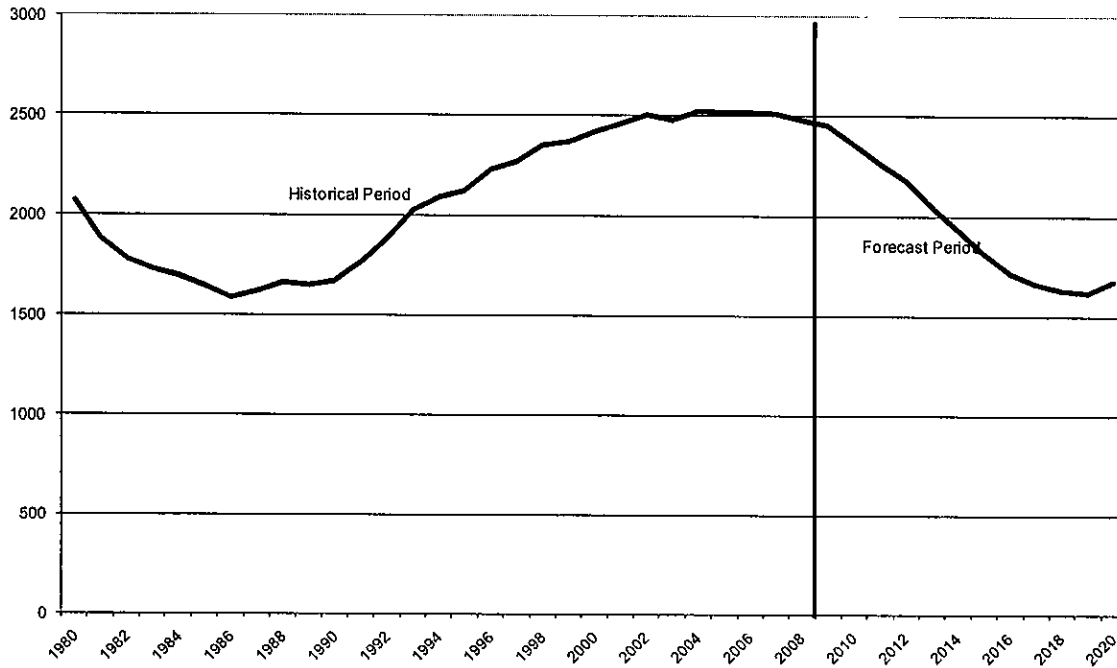


Figure 5
Junior High School Enrollment

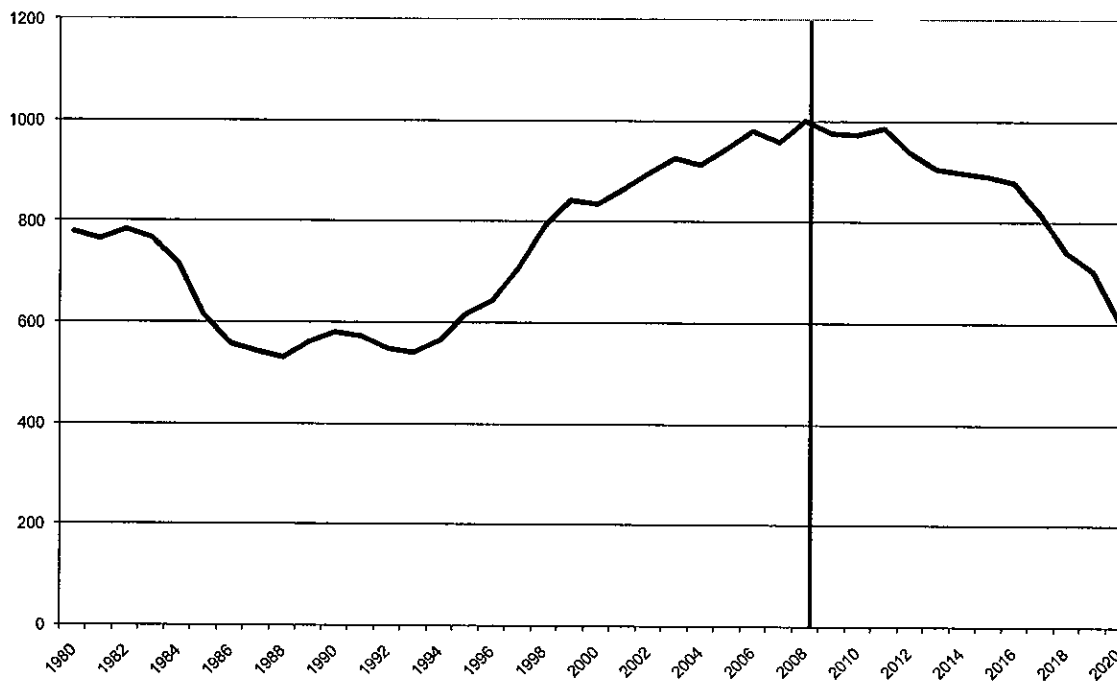


Figure 6
High School Enrollment

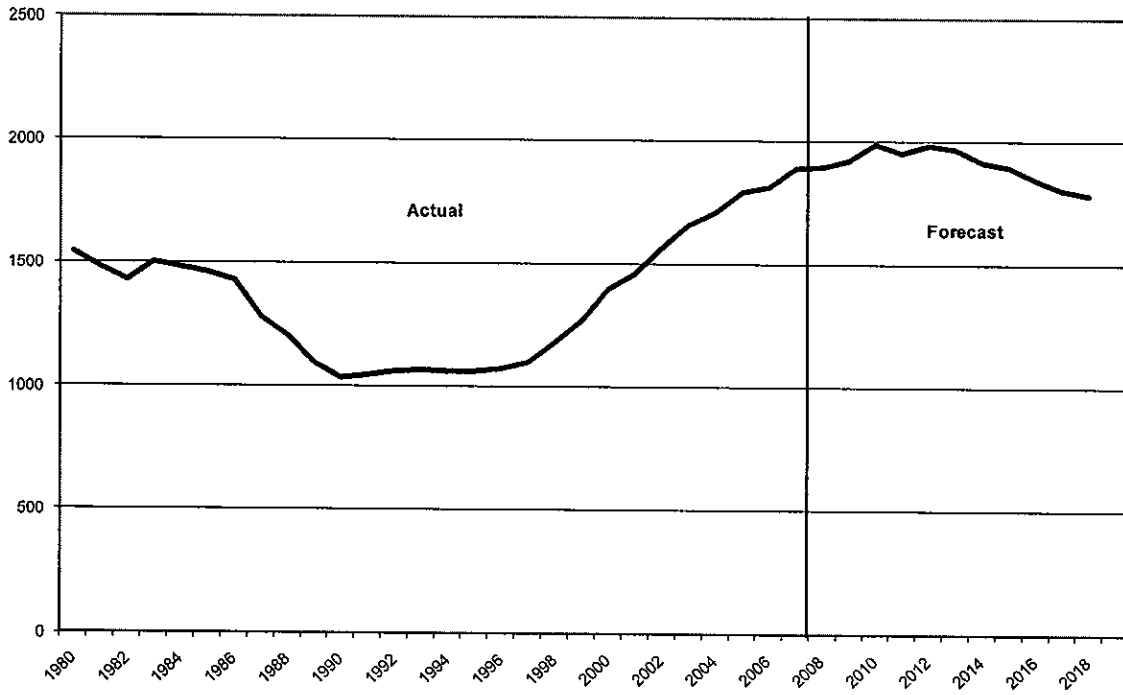


Figure 7
Acton Public School Enrollment: K thru 12

