

**SCHOOL ENROLLMENT TRENDS &  
PROJECTIONS THROUGH 2015-16**

**SAD 51 - CUMBERLAND & NORTH YARMOUTH**

*Prepared for:*  
SAD 51

*Prepared by:*  
PolicyOne Research, Inc  
[www.policyoneresearch.com](http://www.policyoneresearch.com)

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## I. SUMMARY

Using a cohort survival model and based on recent trends in resident birth levels, enrollments, and net migration, PolicyOne Research has projected enrollments for SAD 51 through 2015-16. The results for each grade grouping are summarized in Table 1 and presented within a range of plus or minus 10% for planning purposes.

**Table 1**

<b>Summary of Projected Enrollment for Planning Purposes</b>												
<b>SAD 51 - Cumberland &amp; North Yarmouth - Model: 4yr Average Preschool Net-Migration</b>												
<b>School Year</b>	<b>K-3</b>			<b>4-5</b>			<b>6-8</b>			<b>9-12</b>		
	<b>-10%</b>	<b>Proj.</b>	<b>+10%</b>	<b>-10%</b>	<b>Proj.</b>	<b>+10%</b>	<b>-10%</b>	<b>Proj.</b>	<b>+10%</b>	<b>-10%</b>	<b>Proj.</b>	<b>+10%</b>
2006-07	600	<b>666</b>	733	311	<b>345</b>	380	502	<b>558</b>	613	677	<b>753</b>	828
2007-08	566	<b>628</b>	691	317	<b>353</b>	388	496	<b>551</b>	606	658	<b>731</b>	805
2008-09	603	<b>669</b>	736	304	<b>338</b>	372	486	<b>540</b>	594	633	<b>703</b>	773
2009-10	605	<b>672</b>	739	278	<b>309</b>	340	478	<b>532</b>	585	632	<b>702</b>	772
2010-11	573	<b>637</b>	701	317	<b>352</b>	388	461	<b>512</b>	564	596	<b>662</b>	728
2011-12	601	<b>668</b>	735	305	<b>339</b>	372	446	<b>495</b>	545	586	<b>651</b>	716
2012-13	577	<b>641</b>	705	307	<b>342</b>	376	461	<b>512</b>	563	588	<b>653</b>	719
2013-14	594	<b>660</b>	726	319	<b>354</b>	389	447	<b>497</b>	546	558	<b>620</b>	683
2014-15	602	<b>669</b>	736	285	<b>317</b>	349	489	<b>544</b>	598	540	<b>600</b>	660
2015-16	602	<b>669</b>	736	303	<b>336</b>	370	449	<b>499</b>	549	566	<b>629</b>	692

**Sources & Notes:** Calculated by PolicyOne Research, January 2006

These enrollment projections reflect recent trends in resident births, net preschool and grade to grade migration. They have also been examined in light of recent residential development trends in Cumberland and North Yarmouth. Changes in any of these factors can impact future enrollments and therefore, they should be regularly monitored by SAD 51.

## **II. INTRODUCTION & METHODOLOGY**

The following report assesses trends in school enrollments in SAD 51 from the 1995-96 school year through the 2005-06 and presents enrollment projections through 2015-16. School enrollments are driven by three factors: births to residents within the district, existing enrollment levels, and net-migration of preschool and school-aged children. These enrollment projections reflect each of these factors.

In making enrollment projections, PolicyOne utilizes a cohort survival model. This model involves two steps. First, the relationship between first grade enrollment and resident births in the year that is six years prior are examined using statistical correlation coefficients for the last three through ten year historical periods. The period exhibiting the strongest relationship is then used to project future first grade enrollment based on recent resident births. Second, grade to grade survival ratios are analyzed. These ratios represent enrollment in one year at a given grade level and enrollment at the next grade the following year. The average grade to grade survival ratios are then calculated for the past three through ten year periods and the period exhibiting the strongest relationship determined by correlation coefficients are selected as the projected survival ratio at each grade level. These are then applied to existing enrollments at each grade level and projected entering first grade enrollments to project future enrollments at each grade for the next ten years.

### **III. ENTERING FIRST GRADE ENROLLMENT**

#### **A. Historical Entering First Grade Enrollment**

Over the last ten years, although there have been year to year fluctuations, first grade enrollments have generally declined in SAD 51. Between 1996-97 and 2005-06, first grade enrollments in SAD 51 have ranged from a high of 207 students in 1996-97 to a low of 153 students in 2005-06. On average during the first five-years of this ten year period first grade enrollments averaged 187 students compared to an average of 173 students over the past five years (see Table 2 and Figure 1).

**Table 2**

<b>Historical Relationship of 1st Grade Size to Resident Births</b>					
<b>SAD 51 - Cumberland &amp; North Yarmouth</b>					
<b>Oct 15-Oct14 Birth Year</b>	<b>Resident Births</b>	<b>1st Grade Year</b>	<b>1st Grade Enrollments</b>	<b>Ratio 1st/Births</b>	<b>Net Preschool Migration</b>
1989-90	109	Oct-96	207	1.899	98
1990-91	97	Oct-97	176	1.814	79
1991-92	124	Oct-98	202	1.629	78
1992-93	102	Oct-99	175	1.716	73
1993-94	114	Oct-00	174	1.526	60
1994-95	119	Oct-01	193	1.622	74
1995-96	104	Oct-02	171	1.644	67
1996-97	128	Oct-03	171	1.336	43
1997-98	119	Oct-04	179	1.504	60
1998-99	118	Oct-05	153	1.297	35
10yr Avg(90-99)	113	10yrAvg (96-05)	180	1.599	67
5yr Avg(90-94)	109	5yr Avg(96-00)	187	1.717	78
5yr Avg(95-99)	118	5yr Avg(01-05)	173	1.481	56
4yr Avg(96-99)	117	4yr Avg(02-05)	169	1.445	51
3yr Avg(97-99)	122	3yr Avg(03-05)	168	1.379	46
10 yr Min	97		153	1.297	35
10 yr Max	128		207	1.899	98
<b>Sources &amp; Notes:</b> Births from Maine Department of Health & Human Services, Maine Center for Disease Control & Prevention, Office of Data, Research, & Vital Statistics, "Births & Deaths by Month: Maine Towns, Counties, and State Total"; Historical enrollment data is from Maine Department of Education, October 1st Resident Enrollment Reports; all else calculated by PolicyOne Research					

#### **B. Factors Influencing Entering First Grade Class Sizes**

First grade enrollments are influenced by two factors: the number of births to residents within a district in the year that is six years prior to the enrollment year and net preschool migration (number of preschool-aged children moving into the district minus those moving out) during this period. Each of these factors is examined below.

##### *1. Resident Birth Levels*

In analyzing annual resident births, PolicyOne uses births for the twelve month period from October 15 to October 14 which coincides with the eligibility to enroll into first

grade six years later. Although there have been year to year fluctuations which is common with regard to resident birth levels, between 1989-90 and 1998-99 births to residents of Cumberland and North Yarmouth have increased. In the first five years of this period, annual births averaged 109, while in the last five years of this period they averaged 118. Overall during this ten year period resident births in Cumberland and North Yarmouth ranged from a low of 97 to a high of 128 (See Table 2).

*2. Net Preschool Migration*

The average net preschool migration over the past ten years in SAD 51 equaled 67, meaning first grade enrollments were 67 students greater than the number of resident births six years prior. Although the district has experienced preschool in-migration each year during the past ten years, the level of this in-migration has decreased. In the first five years of the period net preschool migration averaged 78 students annually compared to 56 students in the past five years (see Table 2).

**Taken together the historical birth and net migration data indicate that the decline in first grade enrollments over the past ten years was driven by a decrease in net preschool migration and not changes in resident birth levels.**

**C. Projected First Grade Enrollment**

**Table 3**

<b>Projected First Grade Enrollment</b>					
<b>SAD 51 - Cumberland &amp; North Yarmouth - Model: 4yr Average</b>					
<b>Preschool Net-Migration</b>					
<b>Oct 15-Oct14 Birth Year</b>	<b>Resident Births</b>	<b>1st Grade Year</b>	<b>1st Grade Enrollments</b>	<b>Ratio 1st/Births</b>	<b>Net Preschool Migration</b>
1999-00	114	Oct-06	151	1.324	37
2000-01	135	Oct-07	195	1.445	60
2001-02*	96	Oct-08	138	1.445	43
2002-03*	137	Oct-09	197	1.445	61
2003-04*	105	Oct-10	151	1.445	47
2004-05*	111	Oct-11	160	1.445	49
2005-06 est.	118	Oct-12	170	1.445	52
2006-07 est.	118	Oct-13	170	1.445	52
2007-08 est.	118	Oct-14	170	1.445	52
2008-09 est.	118	Oct-15	170	1.445	52
Avg 00-05	116				
10yr Avg	117		167	1.433	51
10 yr Min	96		138	1.324	37
10 yr Max	137		197	1.445	61

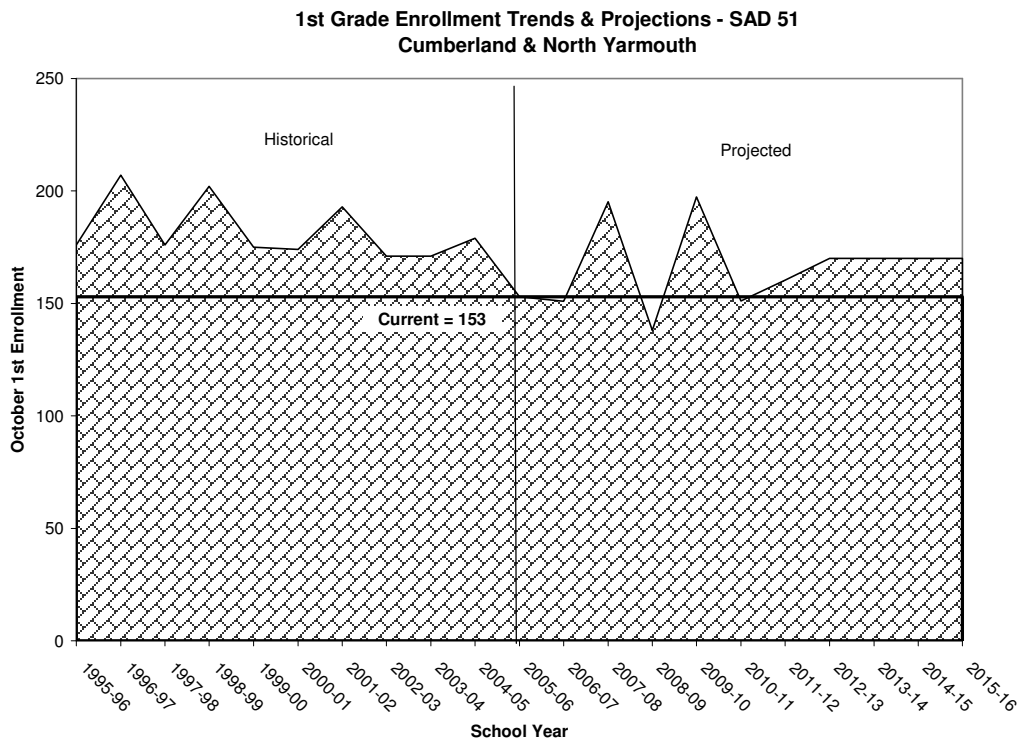
**Sources & Notes:** 1999-00 through 2004-05 births from Maine Department of Health & Human Services, Maine Center for Disease Control & Prevention, Office of Data, Research, & Vital Statistics, "Births & Deaths by Month: Maine Towns, Counties, and State Total", 2001-02 through 2004-05 are preliminary; 2005-06 through 2008-09 are estimated by PolicyOne based on average births over the last five years; all else calculated by PolicyOne Research.

Since 1998-99, resident birth levels in Cumberland and North Yarmouth have remained at average annual levels similar to that in the prior five-year period. Between 1999-00 and 2004-05 resident births have averaged 116 annually, compared to 118 on average annually in the previous five years.

Examining the correlation coefficients regarding the relationship between births and first grade enrollments revealed no periods in which the relationship could be characterized as strong. Based on the historical data, PolicyOne chose to base projections on net preschool migration levels similar to those over the past four years in SAD 51.

Applying the past four-year preschool net migration levels to recent birth levels in Cumberland and North Yarmouth results in projections of first grade enrollments that range from a low of 138 students to a high of 197 students (see Table 3 and Figure 1).

**Figure 1**



**IV. PRIMARY SCHOOL ENROLLMENT (K-3)**

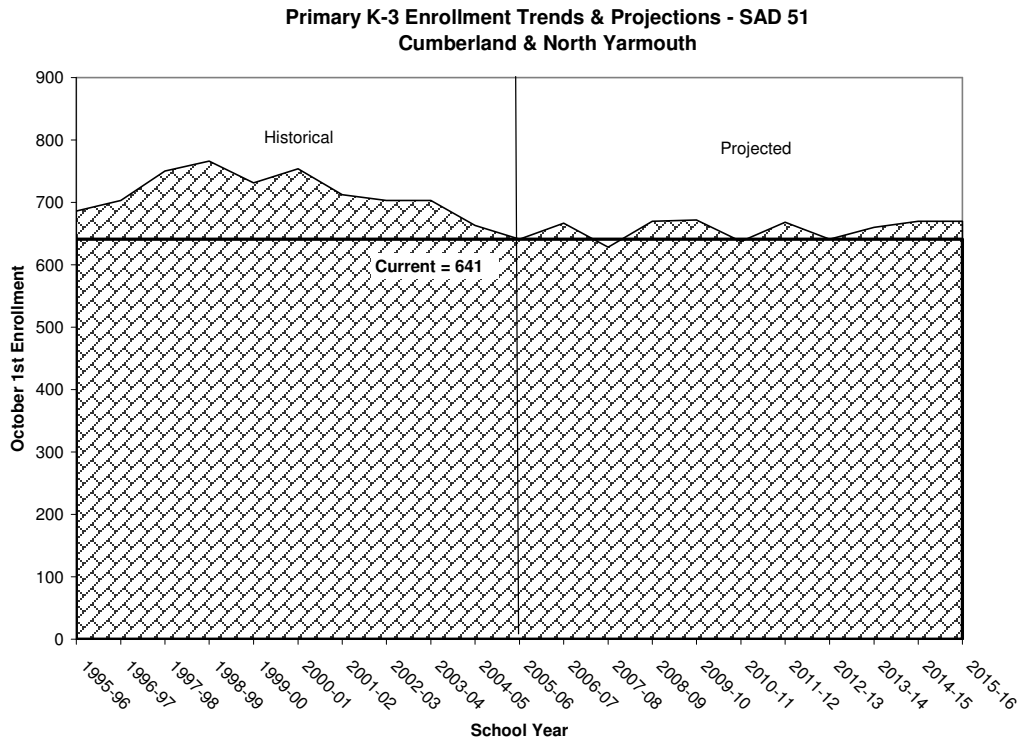
**A. Historical Primary School Enrollment**

Between 1995-96 and 1998-99 primary school enrollments in SAD 51 increased from of level of 686 students to 766 students. Following 1998-99 primary school enrollments have decreased reaching a level of 641 students in 2005-06 (see Table 4 and Figure 2).

## B. Projected Primary School Enrollment

Based on resident birth levels since 1999-00, current primary enrollments, and preschool in-migration levels similar to that over the past four years, PolicyOne projects that primary enrollments in SAD 51 will remain relatively stable over the next ten years ranging from a low of 628 students to a high of 672 students (see Table 4 and Figure 2).

**Figure 2**



## V. ELEMENTARY SCHOOL ENROLLMENT (4-5)

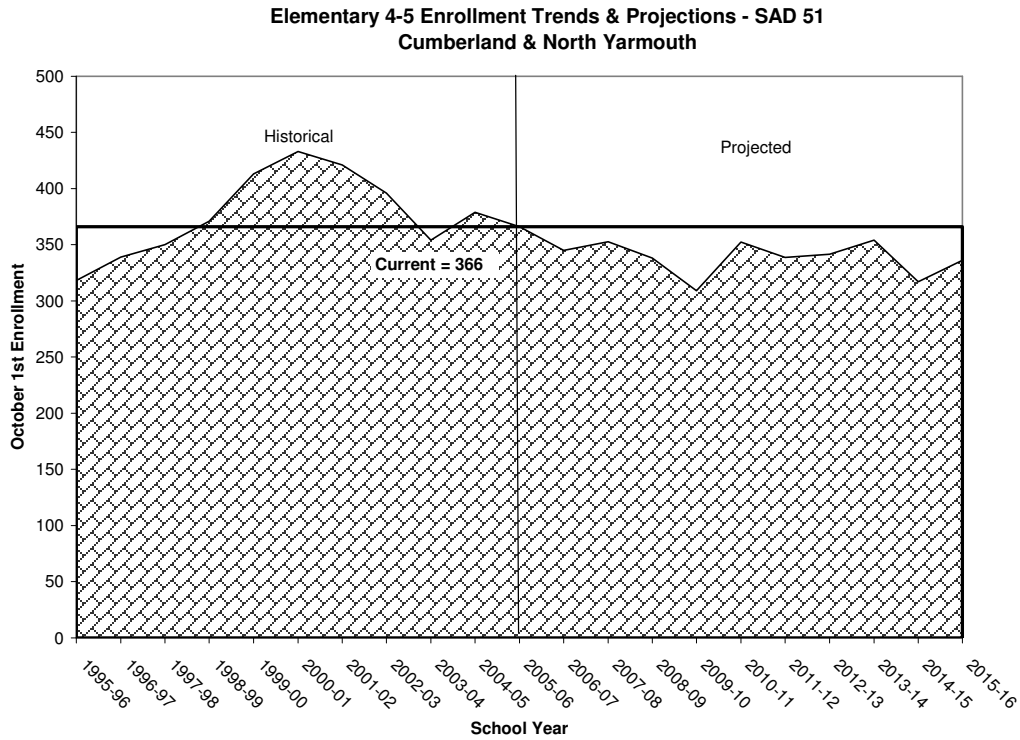
### A. Historical Elementary School Enrollment

Between 1995-96 and 1999-00, elementary school enrollments in SAD 51 increased from a level of 318 students to 433 students. Over the past five years, elementary enrollments have decreased reaching a level of 366 students in 2005-06.

### B. Projected Elementary School Enrollment

Based on existing enrollments, projected enrollments at the primary level, and net migration levels similar to those over the past three years, PolicyOne projects elementary enrollments in SAD 51 will continue to decline and be at levels between 309 students and 354 students through 2015-16 (see Table 4 and Figure 3).

**Figure 3**



**VI. MIDDLE SCHOOL ENROLLMENT (6-8)**

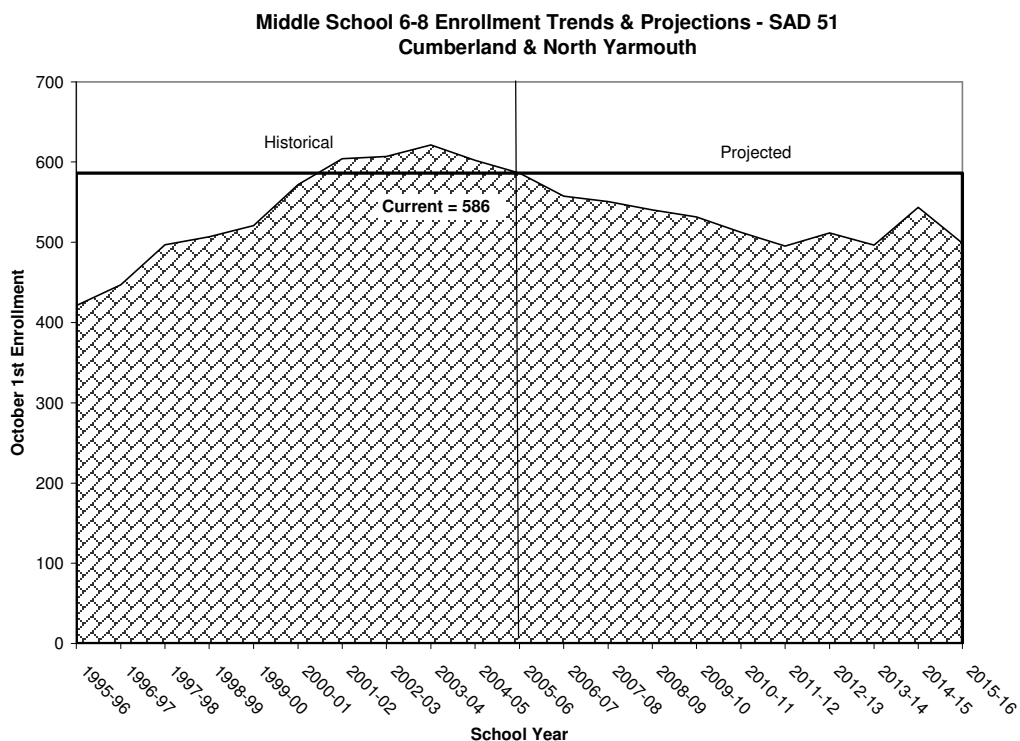
**A. Historical Middle School Enrollment**

Since 1995-96 middle school enrollments increased from 421 students to a level of 621 students in 2003-04. This has been followed by two years of enrollment decreases to a level of 586 students in 2005-06 (see Table 4 and Figure 4).

**B. Projected Middle School Enrollment**

Based on existing enrollments, projected primary and elementary enrollments, and net elementary migration levels similar to those over the past three years, PolicyOne projects that SAD 51 middle school enrollments will continue to decline and be at levels between 600 and 753 students through 2015-16 (see Table 4 and Figure 4).

**Figure 4**



## **VII. HIGH SCHOOL ENROLLMENT (9-12)**

### **A. Historical High School Enrollment**

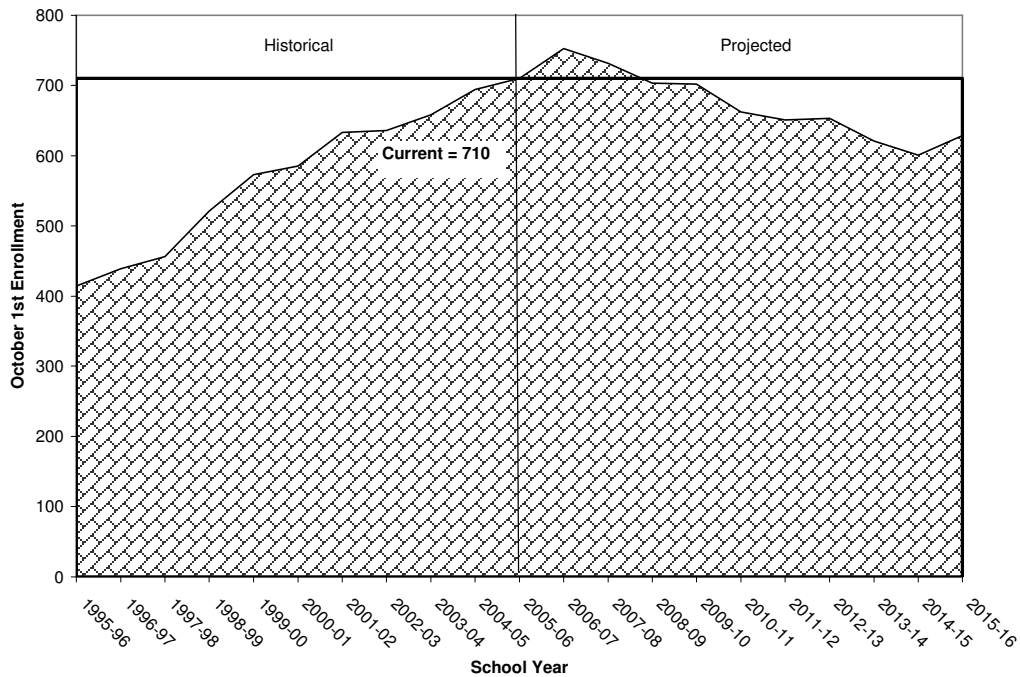
Since the 1995-96 enrollment level of 414 students, high school enrollments have continually increased in SAD 51 reaching a level of 710 students in 2005-06 (see Table 4 and Figure 5).

### **B. Projected High School Enrollment**

Based on existing enrollments, projected enrollments at the K-8 grades, and net migration levels similar to those over the past 3 years, PolicyOne projects high school enrollments will begin to decrease following 2006-07 eventually reaching levels between 600 and 629 students through 2015-16 (see Table 4 and Figure 5). The projected decline in high school enrollments is consistent with the passing of the enrollment “bubble” that passed through the primary level in 1996-97, the elementary level in 2000-01, and middle school level in 2003-04.

**Figure 5**

**High School 9-12 Enrollment Trends & Projections - SAD 51  
Cumberland & North Yarmouth**



## **VIII. TOTAL SCHOOL ENROLLMENT (K-12)**

### **A. Historical Total Enrollment**

Total enrollments in SAD 51 for all grades increased between 1995-96 and 2001-02 from 1,850 students to 2,370 students. This was followed by enrollment decreases to a level of 2,303 in 2005-06 (see Table 4 and Figure 6)

### **B. Projected Total Enrollment**

Based on existing enrollments and projected entering class sizes, and projected grade to grade net migration levels experienced over the past three years, PolicyOne projects total enrollments will continue to decline to levels of around 2,130 by 2015-16 (see Table 4 and Figure 6). The grade to grade enrolments reflect a net in-migration of school-aged students at a level similar that is similar to that experienced in the district over the last three years (See Table 5).

**Figure 6**

**Total K-12 Enrollment Trends & Projections - SAD 51  
Cumberland & North Yarmouth**

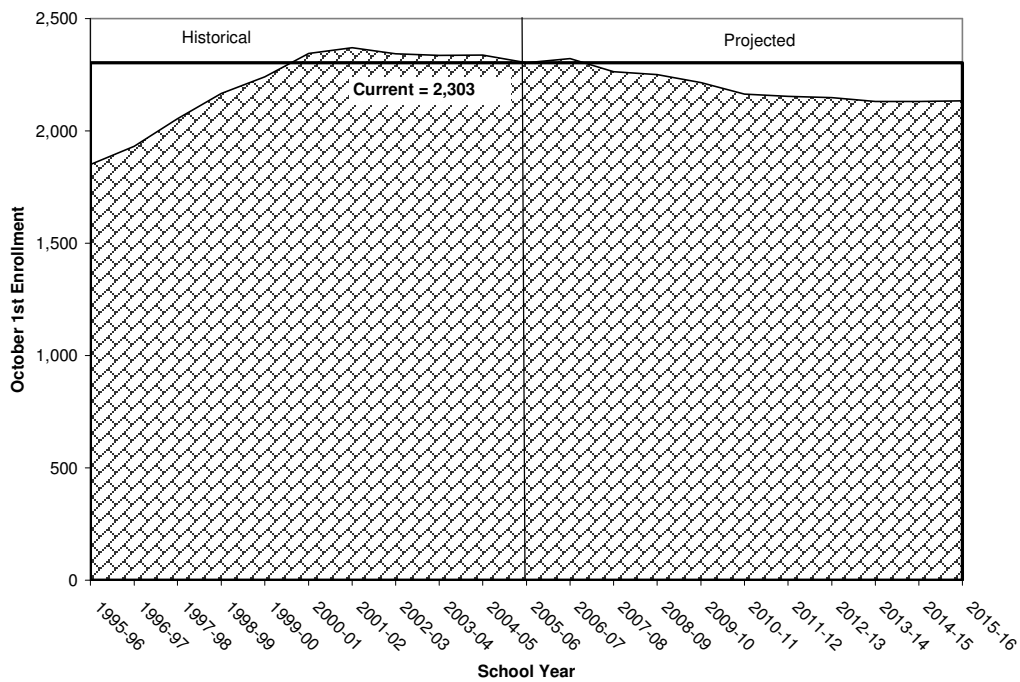



Table 4

Historical and Projected Enrollment Summary																					
SAD 51 - Cumberland & North Yarmouth - Model: 4yr Average Preschool Net-Migration - K-12																					
School Year	Grades												Grade Group Totals					Special Ed.		Total	
	K	1st	2nd	3rd	4th	5th	6th	7th	8th	9th	10th	11th	12th	K-3	4-5	6-8	9-12	K-12	K-8	9-12	K-12
<b>Historical</b>																					
1995-96	189	176	157	164	160	158	160	125	136	106	93	101	114	686	318	421	414	1,839	10	1	1,850
1996-97	150	207	183	163	173	166	163	157	127	137	109	94	99	703	339	447	439	1,928	3	1	1,932
1997-98	178	176	213	183	179	171	169	168	160	129	135	107	85	750	350	497	456	2,053	0	0	2,053
1998-99	157	202	190	217	192	179	172	167	168	148	135	133	105	766	371	507	521	2,165	0	1	2,166
1999-00	154	175	202	200	220	193	185	174	162	165	149	131	128	731	413	521	573	2,238	0	2	2,240
2000-01	187	174	182	211	207	226	195	198	179	150	167	137	131	754	433	572	585	2,344	0	0	2,344
2001-02	158	193	182	179	217	204	223	195	186	171	158	158	146	712	421	604	633	2,370	0	0	2,370
2002-03	165	171	195	172	175	221	198	213	196	172	167	149	148	703	396	607	636	2,342	0	0	2,342
2003-04	169	171	168	195	176	178	216	196	209	188	164	158	148	703	354	621	658	2,336	0	0	2,336
2004-05	143	179	171	170	202	177	185	222	195	200	181	153	160	663	379	602	694	2,338	0	0	2,338
2005-06	143	153	179	166	176	190	182	184	220	185	194	179	152	641	366	586	710	2,303	0	0	2,303
<b>Projected</b>																					
2006-07	185	151	153	178	171	174	193	183	182	210	178	185	179	666	345	558	753	2,322	0	0	2,322
2007-08	131	195	151	152	184	169	176	194	181	174	202	170	185	628	353	551	731	2,263	0	0	2,263
2008-09	187	138	195	150	157	181	172	177	192	173	167	193	170	669	338	540	703	2,251	0	0	2,251
2009-10	143	197	138	194	154	155	184	172	175	183	166	160	193	672	309	532	702	2,215	0	0	2,215
2010-11	152	151	197	137	200	153	157	185	170	167	176	159	160	637	352	512	662	2,163	0	0	2,163
2011-12	161	160	151	196	141	197	155	158	183	163	161	168	159	668	339	495	651	2,153	0	0	2,153
2012-13	161	170	160	150	202	140	200	155	156	175	157	154	168	641	342	512	653	2,148	0	0	2,148
2013-14	161	170	170	159	155	199	142	201	154	149	168	150	154	660	354	497	620	2,131	0	0	2,131
2014-15	161	170	170	169	164	153	202	142	199	147	143	161	150	669	317	544	600	2,130	0	0	2,130
2015-16	161	170	170	169	174	162	155	203	141	190	141	137	161	669	336	499	629	2,133	0	0	2,133
Proj. Min	131	138	138	137	141	140	142	142	141	147	141	137	150	628	309	495	600	2,130	0	0	2,130
Proj. Max	187	197	197	196	202	199	202	203	199	210	202	193	193	672	354	558	753	2,322	0	0	2,322
<b>Sources &amp; Notes:</b> Historical enrollments from Maine Department of Education, October 1st Resident Enrollment Reports; All else calculated by PolicyOne Research, January 2006																					

**Table 5**

<b>Net Migration Grades 1-6 &amp; K-8</b>		
<b>SAD 51 - Cumberland &amp; North Yarmouth</b>		
<b>School Years</b>	<b>Net Migration</b>	
	<b>1-6</b>	<b>K-8</b>
1995/96-1996/97	33	50
1996/97-1997/98	23	57
1997/98-1998/99	28	50
1998/99-1999/00	20	35
1999/00-2000/01	31	69
2000/01-2001/02	5	-1
2001/02-2002/03	-14	-10
2002/03-2003/04	-1	-1
2003/04-2004/05	17	32
2004/05-2005/06	-6	1
10yr Avg	14	28
9yr Avg	11	26
8yr Avg	10	22
7yr Avg	7	18
6yr Avg	5	15
5yr Avg	0	4
4yr Avg	-1	6
3yr Avg	3	11
1st 5yr Avg	27	52
<b>Projected</b>	<b>4</b>	<b>12</b>

**Sources & Notes:** Calculated by PolicyOne Research based on enrollments from Maine Department of Education, October 1st Resident Enrollment Reports

## **IX. RESIDENTIAL DEVELOPMENT TRENDS**

### **A. Cumberland**

Since 1982 there have been five distinct periods of residential development in Cumberland. Between 1982 and 1984 permits for new residential units in Cumberland averaged 31 units annually. This was followed by three years of high growth from 1985 through 1987 in which permits for new residential units averaged 77 annually. Then between 1988 and 1991 annual permits fell to an average of 39. From 1992 through 2003 permits increased again averaging a level of 54 permits annually. In 2002 and 2004 in Cumberland 35 permits were issued each year. During the entire period of 1982-2005 permits for new residential units in Cumberland have averaged 50 units annually (see Table 5 and Figure 7).

From July of 2000 through 2003, Cumberland had an annual cap on new residential building permits of no more than 50 units per year, with some exemptions. The cap was

modified in 2003 and, as it currently stands, permits are capped at 44 for the mainland, 4 for Chebeague Island, plus 2 for affordable units constructed by a non-profit housing organization. The cap contains some exemptions.

**Table 5**

<b>Trends in Residential Building Permits</b>			
<b>SAD 51 - Cumberland &amp; North Yarmouth</b>			
<b>Year</b>	<b>Cumberland</b>	<b>North Yarmouth</b>	<b>Total</b>
1982	18	13	31
1983	31	21	52
1984	45	22	67
1985	69	32	101
1986	86	32	118
1987	76	37	113
1988	39	25	64
1989	38	34	72
1990	34	17	51
1991	43	24	67
1992	68	13	81
1993	59	31	90
1994	51	35	86
1995	41	46	87
1996	40	33	73
1997	44	27	71
1998	65	28	93
1999	38	35	73
2000	82	30	112
2001	53	33	86
2002	39	32	71
2003	66	31	97
2004	35	33	68
2005	35	28	63
<b>Avg 82-05</b>	50	29	79
<b>Avg 82-84</b>	31	19	50
<b>Avg 85-87</b>	77	34	111
<b>Avg 88-91</b>	39	25	64
<b>Avg 92-03</b>	54	31	85
<b>Avg 04-05</b>	35	31	66

**Sources & Notes:** Permit data was provided by Town of North Yarmouth, Manager's Office and Town of Cumberland Code Enforcement Office.

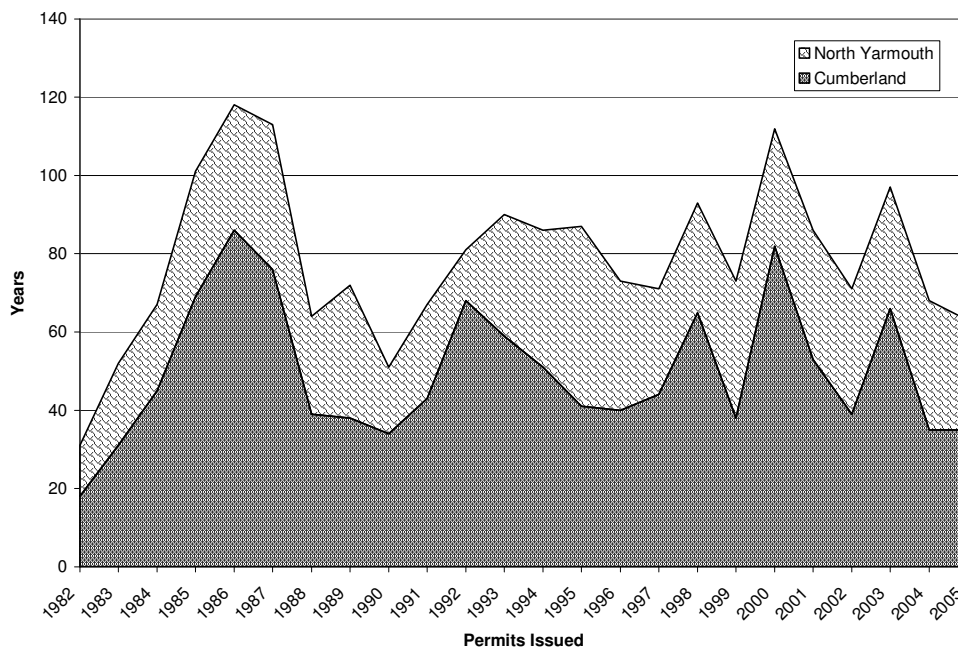
**B. North Yarmouth**

North Yarmouth has also experienced distinct periods of residential development since 1982. Between 1982 and 1984 permits for new residential units in North Yarmouth averaged 19 units annually. Then between 1985 and 1987 permits increased considerably to an average level of 34. Between 1988 and through 1991 annual permits fell to average levels of 25. Since 1991 annual permits have averaged 31. During the entire period of 1982-2005 permits for new residential units in North Yarmouth have averaged 29 units annually (see Table 5 and Figure 7).

In the 1990's North Yarmouth had a growth cap limiting new residential development to 5% of existing housing stock per year. Between 2000 and 2006 North Yarmouth's cap was changed to a limit of 30 units per year with certain exceptions for land gifts and log-time residents. Starting in 2007, North Yarmouth's cap will be changed to allow unlimited new residential development in designated village center and residential districts and restrict growth in resource protection districts to a total of no more than 15 units per year.

**Figure 7**

**Residential Building Permit Trends - 1982-2005 - SAD 51  
Cumberland & North Yarmouth**



**C. Cumberland North Yarmouth Total**

Overall the communities within SAD 51 (Cumberland and North Yarmouth) combined experienced four distinct periods of residential growth. From 1982 to 1984, permits for new residential units averaged 50 annually. This was followed by an increase between 1985 and 1987 in which permits averaged 111 units annually. Between 1988 and 1991 permits fell to an average of 64 units annually. This was followed by a growth period in which permits averaged 85 units annually between 1992 and 2003. Over the past two years, through 2005, permits have decreased and averaged 66 units annually. During the entire period of 1982-2005 permits for new residential units in Cumberland and North Yarmouth combined have averaged 79 units annually (see Table 5 and Figure 7).

PolicyOne’s enrollment projections are based on net-migration levels experienced over the past 3-4 years. These are reflective of residential development levels experienced in

Cumberland and North Yarmouth over the past five years in which both communities have had a residential growth cap. Starting in 2007 North Yarmouth will be lifting its cap in village growth districts. This could have an impact on overall development levels and hence school enrollments. SAD 51 should monitor annual changes in residential development trends and growth policies within both communities.