

# Enrollment Projections for ORCSD, 2011-2021

## Long Range Planning Committee

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# Summary of LRPC Goals

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- Provide the School Board with enrollment projections for each of the next 10 years.
- Make every effort to provide projections for the following school year in the fall when they can be used in the budgeting process.
- Continually improve and refine the model used to make enrollment projections.

# Methodology

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- Multiple linear regression equations based on historical births and enrollment trends are used to project students in kindergarten and grade 1.
- Grade Progression Ratios (GPRs) are used to forecast the number of students in grades 2 through 12.

# Projections for Grades 2-12

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- Calculate GPR's for each grade and year
- Find the 5 year average GPR for each grade.
- Apply 5-year average GPR's to actual and predicted enrollments to predict enrollments into the future.
- Takes into account the net migration (in-migration and out-migration) over time and by grade (different GPR for each grade).

# What is a “Grade Progression Ratio?”

Number of students in grade J and year t

+

Add students who move to ORSD in grade J+1 and year t+1

-

Subtract students who leave ORSD before grade J+1 and year t+1

=

Number of students in grade J+1 and year t+1

A numerical example:

200 students in 5<sup>th</sup> grade in 2009

+ 10 new students join ORSD at the 6<sup>th</sup> grade for 2010

-15 students leave ORSD before 6<sup>th</sup> grade in 2010

= 195 students in 6<sup>th</sup> grade in 2010

GPR (5<sup>th</sup> to 6<sup>th</sup> =  $195/200 = .975$ )

# Recent Innovations

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- Model rewritten and simplified in 2009-2010.
- HS tuition students now are included in the model's enrollment estimates (based on GPR).
- Separate enrollment estimates for Mast Way and Moharimet schools also are provided.

# Elementary School Split

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- Historical ratios used to estimate Kindergarten and grade 1 split between the schools
- District-wide GPR used to project grades 2-4 based on projections for grades 1-3 at each school

# How Accurate Are the Projections?

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- Backcasting (running today's model against historical data to "predict" historical enrollment) shows the model to be most accurate in the near term with average error of estimate approximately 2% (plus or minus) one year out.
- The average error of estimate increases as we project further out in time, reaching about 8% (plus or minus) when projecting ten years into the future.



# The Projections



Enrollment Projections For Oyster River School District							Average Absolute Error of Estimate	
2011 Actual to 2021 Projected							Percent Error To Total	
Year	K	1-4	5-8	9-12	Total			
2011-12	106	606	612	680	2004	Actual Year		
2012-13	113	598	637	676	2024	One Year Out	2%	
2013-14	101	573	632	677	1983	Two Years Out	3%	
2014-15	102	568	621	675	1965	Three Years Out	4%	
2015-16	94	536	633	656	1919	Four Years Out	5%	
2016-17	88	496	625	683	1891	Five Years Out	6%	
2017-18	82	473	598	678	1830	Six Years Out	6%	
2018-19	80	439	592	665	1776	Seven Years Out	6%	
2019-20	77	421	560	678	1735	Eight Years Out	7%	
2020-21	76	404	517	670	1667	Nine Years Out	8%	
2021-22	74	389	494	641	1598	Ten Years Out	8%	

## **Highlights: Current to 2021-22**

- (1) Total enrollment drops by about 400 or 20% over 10 years.**
- (2) High School enrollment decreases by 40, as the forecasted 60 tuition students do not fully offset the decline in resident high school students.**
- (3) Middle School enrollment declines by 118.**
- (4) Elementary school enrollment declines by about 250 students over 10 years.**

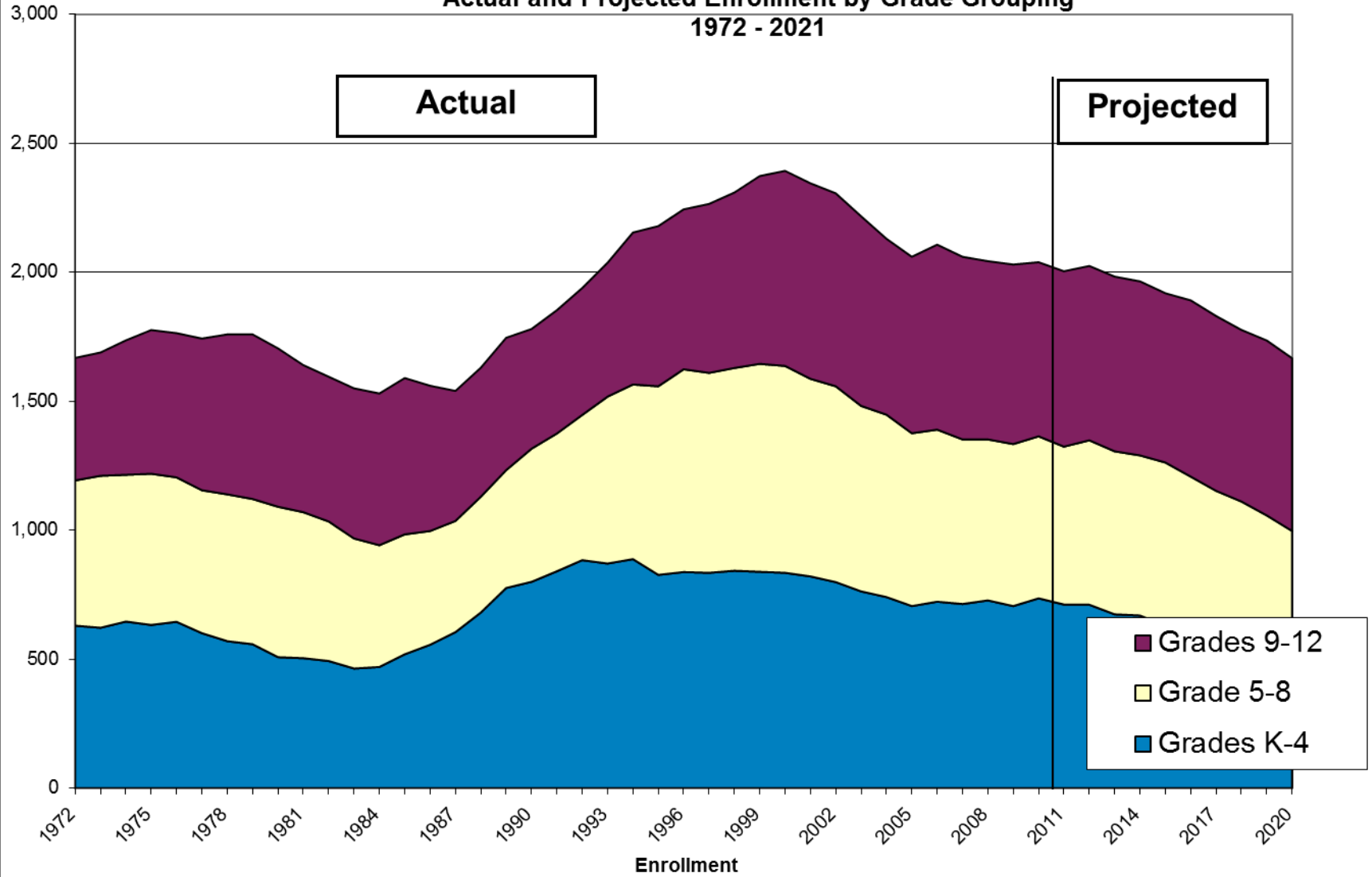
# HS Tuition Students in Projection

Actual	Year	HS Tuition Students				Total	HS Total Without Tuition
		<u>Grade 9</u>	<u>Grade 10</u>	<u>Grade 11</u>	<u>Grade 12</u>		
→	2011	18	13	11	6	48	632
	2012	13	18	13	11	55	620
	2013	16	14	18	13	60	617
	2014	15	16	13	18	63	612
	2015	14	15	16	13	58	598
	2016	16	14	15	16	61	622
	2017	15	16	14	15	61	617
	2018	14	16	16	14	60	606
	2019	16	15	16	16	62	616
	2020	15	16	14	16	61	609
	2021	14	16	16	14	60	582

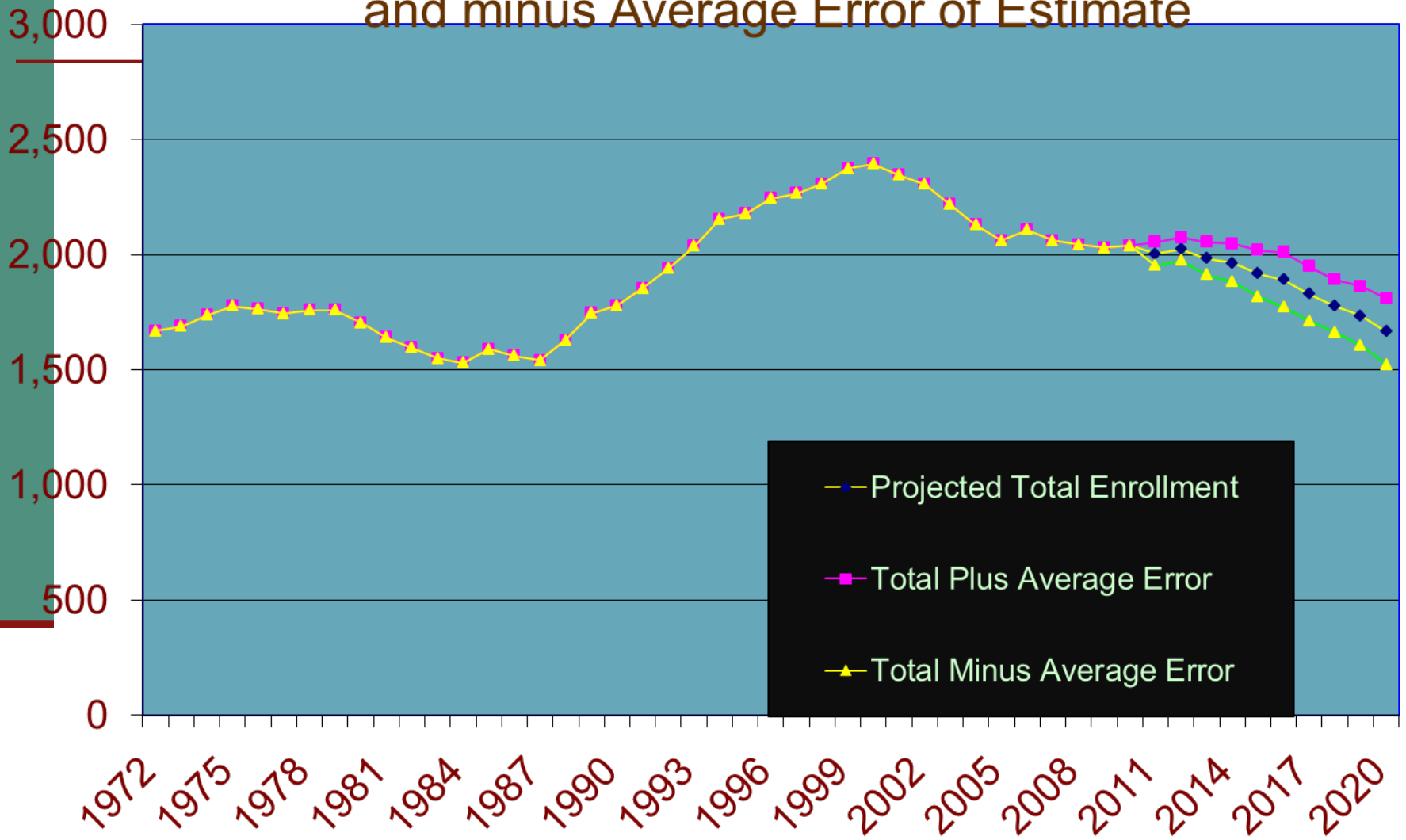
# Elementary School Projections

	Mast Way Projections						Moharimet Projections						Total
	<u>K</u>	<u>1</u>	<u>2</u>	<u>3</u>	<u>4</u>	<u>Total</u>	<u>K</u>	<u>1</u>	<u>2</u>	<u>3</u>	<u>4</u>	<u>Total</u>	<u>Both</u>
2011-12	41	73	59	85	66	324	65	72	83	72	96	388	712
2012-13	53	73	74	60	85	345	60	77	73	84	72	366	711
2013-14	48	62	74	75	60	318	53	66	79	74	84	356	674
2014-15	48	65	63	75	75	326	54	69	67	80	74	344	670
2015-16	44	55	66	63	75	304	49	59	70	68	80	326	630
2016-17	41	53	56	67	63	281	46	57	60	71	67	302	583
2017-18	39	51	54	57	67	268	43	54	58	61	71	287	555
2018-19	38	49	52	55	57	250	42	52	55	59	61	269	519
2019-20	36	47	50	52	55	240	41	50	53	56	59	258	498
2020-21	36	45	47	50	52	231	40	48	51	54	56	248	480
2021-22	35	44	46	48	50	224	39	47	49	51	54	240	464

### Oyster River School District Actual and Projected Enrollment by Grade Grouping 1972 - 2021



# Actual and Projected Enrollment plus and minus Average Error of Estimate



# Declining Enrollment Predicted in Statewide Studies

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NH Center for Public Policy (September 2007)

*“The population that is school-aged...is now expected to level off and decline slightly by 2020.”*

Western Interstate Commission for Higher Education ( March 2008)

*“The state will see a mostly uninterrupted decline in the number of public high school graduates through 2016-17..”*

New Hampshire Housing study prepared by Applied Economic Research (May 2005)

*“Communities not adding many new housing units will likely see declining enrollment in the coming years”*

# Summary

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- **Total ORCSD enrollment is projected to decline significantly, by about 400 students over 10 years from just over 2,000 in 2011-12 to under 1,600 in 2021-22.**
- **Student populations at the elementary schools will decrease, with each school's enrollment dropping by more than 100 students (one class per grade) over 10 years.**
- **Middle school enrollment, now 612 is projected to rise slightly and then drop to under 500 by 2021.**
- **High School enrollment, now 680, will drop to 640, as new tuition students are not expected to offset the drop in resident students.**



# NESDEC Projection Confirms Enrollment Decline

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- NESDEC predicts enrollment decline of 300 over the next 10 years.
- First 5 years LRPC enrollment predicts higher enrollment than NESDEC, due to higher predicted first grade in 2012-13.
- Later years, NESDEC predicts higher enrollment because they assume births return to high 80's.
- Actual Births 75 in 2010, 76 in 2011

# Comparison of Total Enrollment Projections

	LRPC K-12	NESDEC K-12	LRPC Projection	
Year	Projection	Projection	Higher	(Lower)
2011-12	2004	2004	0	
2012-13	2024	2004	20	
2013-14	1983	1972	11	
2014-15	1965	1956	9	
2015-16	1919	1911	8	
2016-17	1891	1887	4	
2017-18	1830	1846	(16)	
2018-19	1776	1809	(33)	
2020-21	1735	1787	(52)	
2021-22	1667	1739	(72)	
2022-23	1598	1697	(99)	

# NESDEC LRPC Variance by Grade

Variance LRPC Higher (Lower)													
Year	K	1	2	3	4	5	6	7	8	9	10	11	12
2011	0	0	0	0	0	0	0	0	0	0	0	0	0
2012	1	24	(0)	(0)	(1)	4	(2)	(1)	0	(0)	(1)	(0)	(1)
2013	(0)	(6)	24	(0)	(1)	2	2	(4)	(1)	0	(1)	(1)	(1)
2014	(12)	14	(7)	24	(2)	2	0	(1)	(4)	(2)	(1)	(1)	(3)
2015	12	(22)	10	(7)	23	2	(0)	(2)	(0)	(4)	(3)	(0)	1
2016	(1)	12	(23)	13	(8)	26	(1)	(2)	(2)	(1)	(5)	(3)	(2)
2017	(18)	(1)	12	(23)	12	(5)	25	(2)	(2)	(2)	(2)	(5)	(4)
2018	(17)	(18)	(1)	12	(24)	15	(8)	24	(2)	(2)	(4)	(1)	(6)
2019	(20)	(19)	(19)	(2)	11	(22)	14	(9)	24	(2)	(2)	(3)	(3)
2020	(17)	(21)	(20)	(20)	(3)	14	(24)	12	(9)	25	(3)	(2)	(4)
2021	(21)	(21)	(23)	(21)	(21)	(1)	13	(26)	12	(10)	25	(3)	(4)

NESDEC assumes grade progression based on this year's low K enrollment. LRPC bases next year's grade 1 on births 6 years before.

Lower actual births in 2010 - 2011 impact this cohort the most.

NESDEC assumes births rebound to high 80's. LRPC assumes continued downward trend. Difference is approximately one class per year.

Because LRPC uses average of two years' births to predict each cohort, differences explained by blue and lavender comments above are offset in prior and following years.

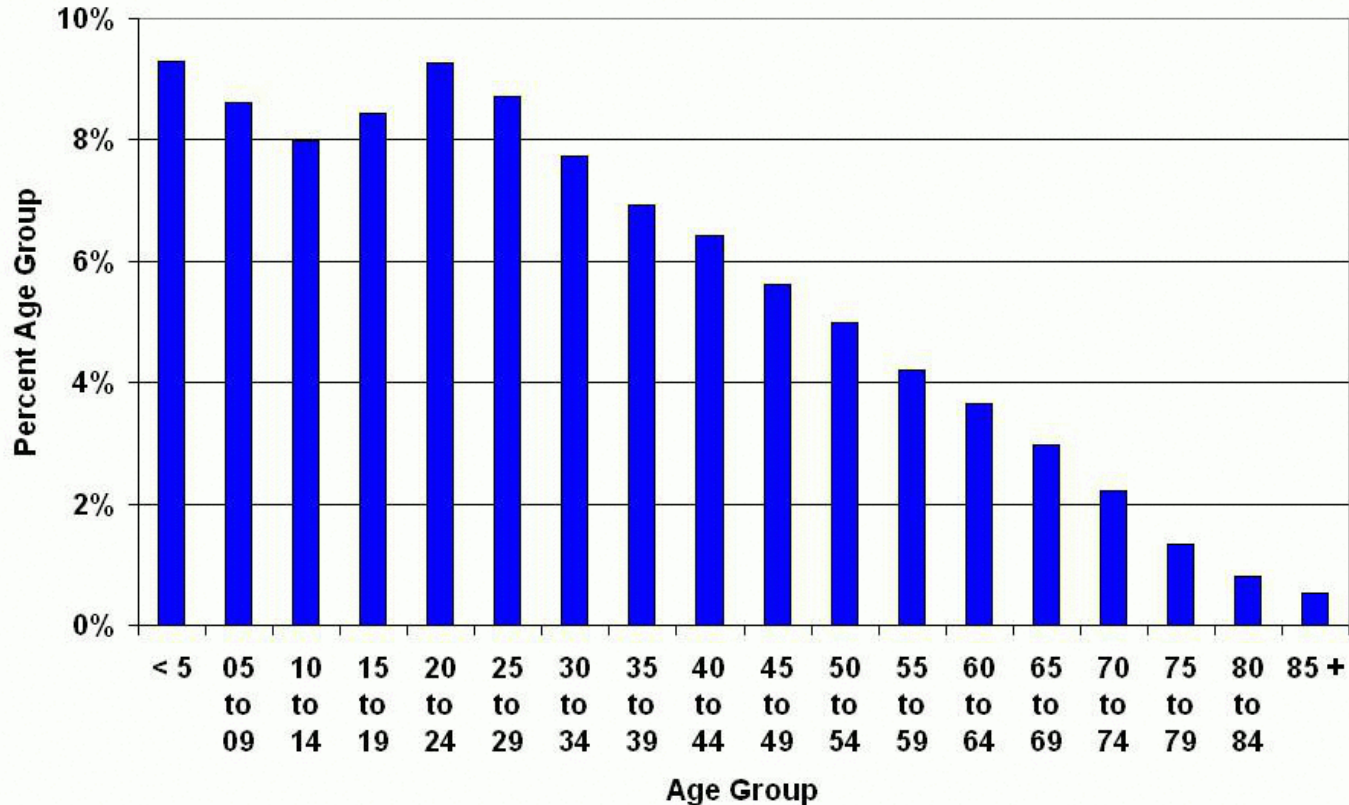
# Why Look at Demographics?

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- Demographics Help Explain Why Enrollment is declining.
- Demographics Help Predict Whether Enrollment will continue to decline.
- Demographics Will Not tell us the precise rate of decline.
- Demographics Will Not tell us whether the enrollment decline over 10 years will be 300 or 400 students or some other number.

# Watch NH's Population Change

New Hampshire Population Distribution by Age, 1900



MakeAGIF.com

New Hampshire began the 20<sup>th</sup> Century with the majority of its population under the age of 30 and relatively few aged 60 and older. Watch how that shifts through the decades. Look out especially for the bump that arrives in the 1950 Census – the Baby Boom Generation – and see how they dominate the subsequent decades. (When you've watched the entire cycle, through 2010, press the down arrow key to continue the presentation.)

# Demographics of the ORCSD

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- Fastest growing segments are 64+ and 40-64
- 15-24 age group also growing due to increase in UNH enrollment.
- Numbers of children and young adults aged 25-39 are shrinking.

# Ten Year Population Trends

			Increase (-Decrease)	% Increase (-Decrease)	CAGR
<u>Age</u>	<u>2000</u>	<u>2010</u>	<u>10 Years</u>	<u>10 Years</u>	<u>2000-2010</u>
0-14	2622	2198	-424	-16.2%	-1.7%
15-24	8185	10503	2318	28.3%	2.5%
25-39	2327	1670	-657	-28.2%	-3.3%
40-64	3999	4759	760	19.0%	1.8%
65+	<u>1185</u>	<u>1609</u>	<u>424</u>	35.8%	3.1%
Total Population	18318	20739	2421	13.2%	1.2%

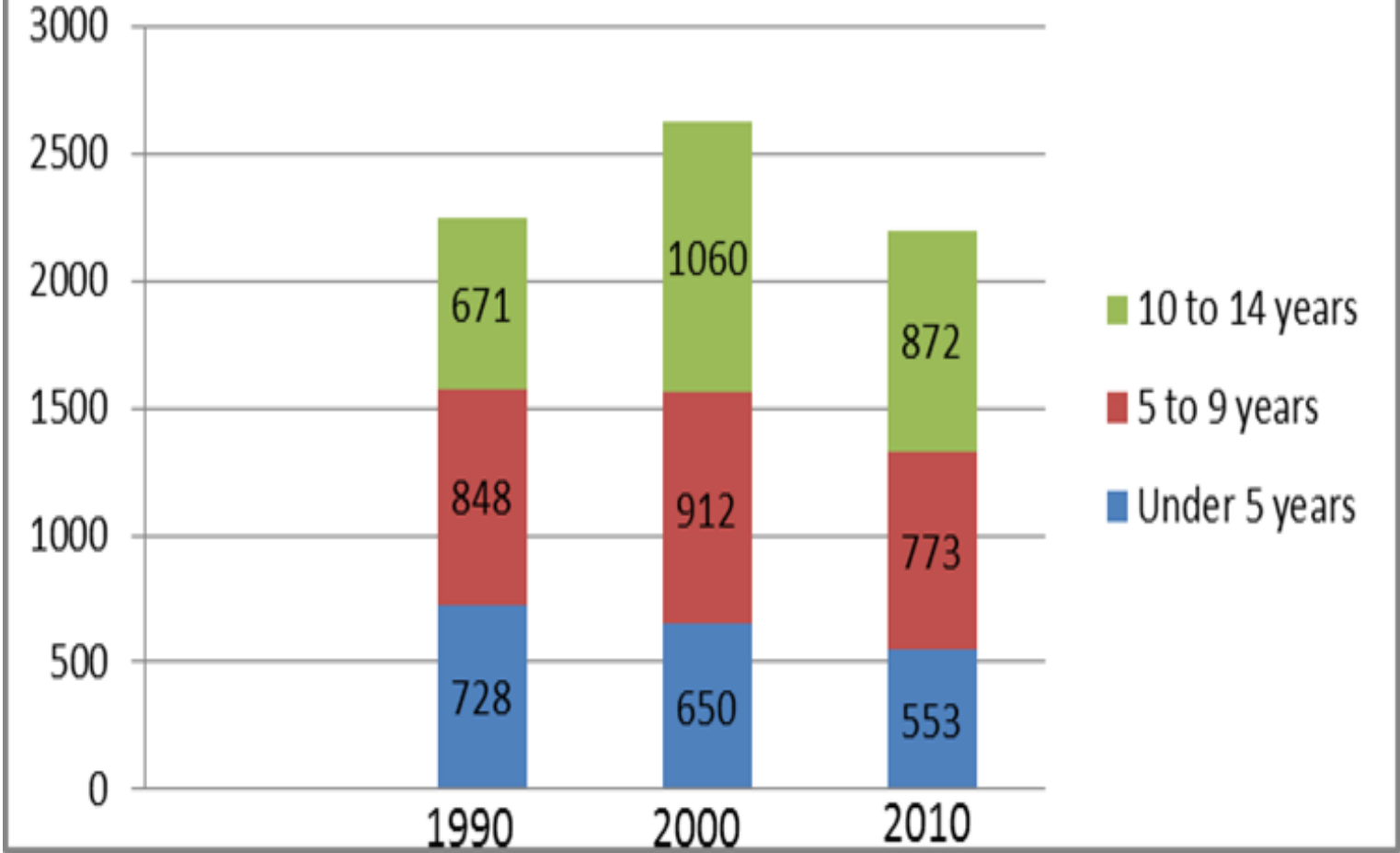
# Twenty Year Population Trends

			Increase (-Decrease)	% Increase (-Decrease)	CAGR
<u>Age</u>	<u>1990</u>	<u>2010</u>	<u>20 Years</u>	<u>20 Years</u>	<u>1990-2010</u>
0-14	2247	2198	-49	-2.2%	-0.2%
15-24	7925	10503	2578	32.5%	2.9%
25-39	2857	1670	-1187	-41.5%	-5.2%
40-64	3030	4759	1729	57.1%	4.6%
65+	<u>992</u>	<u>1609</u>	<u>617</u>	62.2%	5.0%
<b>Total Population</b>	<b>17051</b>	<b>20739</b>	<b>3688</b>	<b>21.6%</b>	<b>2.0%</b>



# Number of Children in ORCSD

Source: U.S. Census Bureau



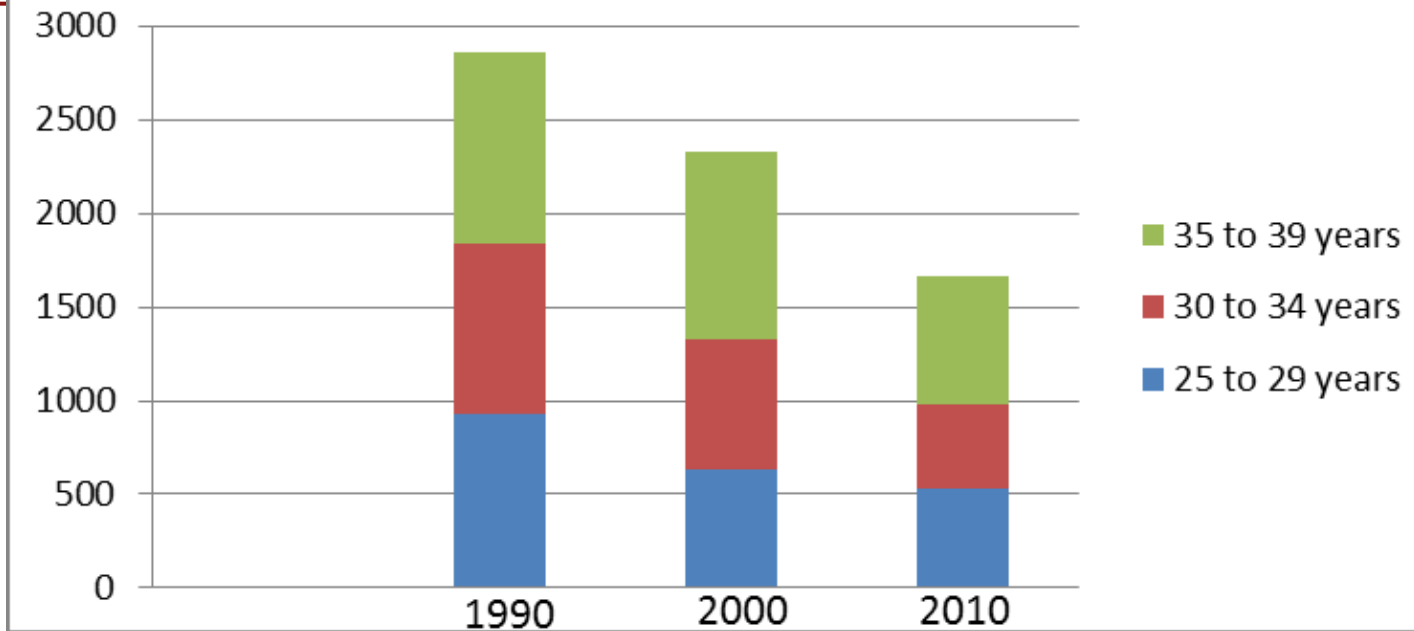
# Births after the 2010 Census to Mothers Residing in ORCSD

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- 70 from April 1, 2010 to March 31, 2011.
- 66 from April 1, 2011 to March 31, 2012.

# ORCSD Adults in Prime Childbearing Years

Source: *Us Census Bureau*



# Housing in the ORCSD

	Durham	Lee	Madbury	Total	Durham	Lee	Madbury	Total	2000-2010	2000-2010	2000-2010
<u>Housing</u>	<u>Number</u>	<u>Number</u>	<u>Number</u>	<u>ORCSD</u>	<u>Number</u>	<u>Number</u>	<u>Number</u>	<u>ORCSD</u>	<u>Change</u>	<u>Change</u>	<u>CAGR</u>
				<u>Number</u>				<u>Number</u>	<u>Number</u>	<u>Percent</u>	<u>Annual Rate</u>
	<u>2010</u>	<u>2010</u>	<u>2010</u>	<u>2010</u>	<u>2000</u>	<u>2000</u>	<u>2000</u>	<u>2000</u>			
<b>OCCUPANCY STATUS</b>											
Total housing units	3,092	1,765	653	5510	2,923	1,534	543	5,000	510	10.2%	1.0%
Occupied housing units	2,960	1,661	626	5247	2,882	1,466	534	4882	365	7.5%	0.7%
Vacant housing units	132	104	27	263	41	68	9	118	145	122.9%	8.3%
<b>TENURE</b>											
Occupied housing units	2,960	1,661	626	5247	2,882	1,466	534	4882	365	7.5%	0.7%
Owner occupied	1,713	1,294	514	3521	1,628	1,104	412	3144	377	12.0%	1.1%
Renter occupied	1,247	367	112	1726	1,254	362	122	1738	-12	-0.7%	-0.1%

# Summary of Town Plans

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- **Durham** ( Most recent Master Plan 2000) Work with UNH to update plans; Recent statements support environmentally friendly commercial development and off campus apartments.
- **Lee** (Most recent Master Plan 2006) Retain Rural/ Agricultural Character; Discourage Residential development.
- **Madbury** (Most recent Master Plan 2001) Respect rural character and natural resources but allow varied types of residential development.

# Summary of Demographic Report

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- The number of children under age 15 in ORCSD was lower in 2010 than it was in 1990.
- The number of adults aged 25-39 declined 28.3% from 2000-2010 and 41.5% from 1990 – 2010.
- Housing grew at the rate of 1% per year over the 2000-2010 period.
- The new rental housing being built in Durham is targeted to college students, not families.