

Enrollment Projection Methodologies

Planning for Future School Facility Needs



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Projection Basics

- What are the purposes for the projections?
 - Short-term Budgeting/Staffing
1 – 2 year horizon
 - Facility Planning
7-10+ year horizon
- Purpose defines acceptable projection methods



Cohort Survival



Kindergarten Calculation: $((125-145) \times 3 + (145-139) \times 2 + (139-125) \times 1) / 6 = -6$
Other Grade Calculations:
Example 1st grade cohort $((144-145) \times 3 + (141-139) \times 2 + (130-125) \times 1) / 6 = +1$

Cohort Survival



Problem: 2 years of K increase and 1 year of decrease = consistent K drop

Cohort Survival

■ PROS

- Simple formula/simple explanation
- Valid for short term projections
- Valid for areas with stable/consistent change (urban districts)
- School projections using cohorts take into consideration intra-district student transfers: valid for short-term staffing needs

Cohort Survival

■ CONS

- Lumps all factors influencing projections into a mathematical formula.
- 4 years of data/3 years of change: valid for only short-term projections
- K changes based upon historical K – birth data from 5 to 10 years previous- does not reflect most recent birth data from the last 5 years
- Poor method for areas of residential growth/changes (suburban)
- School-based projections lose validity when boundary changes affect historical enrollment data stream
- Projections lose validity when education policy changes (ie. magnet schools, program changes at site, etc.) affect historical enrollment data stream at individual school sites

Alternative Projections

Projection Methods Useful for
Short and Long-Range District
Facility Planning

Projection Requirements

- Must have enough demographic detail to deal with boundary planning and future school site location analysis (openings and closures)
- Residence (for facility planning) vs. Actual School Enrollment (for staffing)
- Must address both short term and long term



CALIFORNIA STATE
DEPARTMENT OF EDUCATION
Bill Hong, Superintendent of Public Instruction
Sacramento, 1986

Demographic Detail

- Study Area Concept
 - Small areas to analyze demographic changes over time independent of attendance boundary shifts
 - Projections at this level can be used to shift boundaries for analyzing opening/closing of school sites



Factors That Influence Enrollment

- Past births in the District area affect K
- Residential construction/demolition
- Move in/out of families in existing homes
- Drop-outs
- Private school transitions

Projection Methodology

- Graduate 12th grade; move up other grades
- Increase/decrease future K classes based upon changes in births within the last 5 years
- Add enrollment generated by new construction
- Modify enrollment as grades progress each year based upon a cohort factor calculated from historical enrollment in areas with no new construction (addresses in/out migration, drop-outs and private school movement)

Step #1: Standard Grade Progression

Study Area	15A	Projection Date 10/15/2003							
	ACTUAL	PROJECTED RESIDENT STUDENTS							
	2003	2004	2005	2006	2007	2008	2009	2010	
K	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	
1	10.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	
2	7.0	10.0	8.0	8.0	8.0	8.0	8.0	8.0	
3	8.0	7.0	10.0	8.0	8.0	8.0	8.0	8.0	
4	4.0	8.0	7.0	10.0	8.0	8.0	8.0	8.0	
5	5.0	4.0	8.0	7.0	10.0	8.0	8.0	8.0	
6	4.0	5.0	4.0	8.0	7.0	10.0	8.0	8.0	
7	7.0	4.0	5.0	4.0	8.0	7.0	10.0	8.0	
8	7.0	7.0	4.0	5.0	4.0	8.0	7.0	10.0	
9	8.0	7.0	7.0	4.0	5.0	4.0	8.0	7.0	
10	9.0	8.0	7.0	7.0	4.0	5.0	4.0	8.0	
11	2.0	9.0	8.0	7.0	7.0	4.0	5.0	4.0	
12	5.0	2.0	9.0	8.0	7.0	7.0	4.0	5.0	
K-6	46.0	50.0	53.0	57.0	57.0	58.0	56.0	56.0	
7-8	14.0	11.0	9.0	9.0	12.0	15.0	17.0	18.0	
9-12	24.0	26.0	31.0	26.0	23.0	20.0	21.0	24.0	

Step #2: Increase/Decrease K from Area Birth Data

Study Area	15A	Projection Date		10/15/2003					
	ACTUAL	PROJECTED RESIDENT STUDENTS							
	2003	2004	2005	2006	2007	2008	2009	2010	
K	8.0	8.8	8.6	8.6	8.2	8.2	8.0	8.0	
1	10.0	8.0	8.8	8.6	8.6	8.2	8.2	8.0	
2	7.0	10.0	8.0	8.8	8.6	8.6	8.2	8.2	
3	8.0	7.0	10.0	8.0	8.8	8.6	8.6	8.2	
4	4.0	8.0	7.0	10.0	8.0	8.8	8.6	8.6	
5	5.0	4.0	8.0	7.0	10.0	8.0	8.8	8.6	
6	4.0	5.0	4.0	8.0	7.0	10.0	8.0	8.8	
7	7.0	4.0	5.0	4.0	8.0	7.0	10.0	8.0	
8	7.0	7.0	4.0	5.0	4.0	8.0	7.0	10.0	
9	8.0	7.0	7.0	4.0	5.0	4.0	8.0	7.0	
10	9.0	8.0	7.0	7.0	4.0	5.0	4.0	8.0	
11	2.0	9.0	8.0	7.0	7.0	4.0	5.0	4.0	
12	5.0	2.0	9.0	8.0	7.0	7.0	4.0	5.0	
K-6	46.0	50.8	54.4	59.0	59.2	60.4	58.4	58.4	
7-8	14.0	11.0	9.0	9.0	12.0	15.0	17.0	18.0	
9-12	24.0	26.0	31.0	26.0	23.0	20.0	21.0	24.0	

In the example above, K is increased from the year 2003 to 2004 by 10% due to a 10 % increase in area births from 1998 (2003 K class) to 1999 (2004 K class)

Birth Data

- One factor in determining future K class sizes
- Most children are 5 years of age in K
- Compare birth data 5 years ago with more recent years data to ascertain future trends in possible future kindergarten classes

Correlation of births with K five years later

Births vs. Kindergarten**					
	Birth Year	Births	K Year	K Class in Zipcode	% of Births
Y e a r	1991	654	1996	397	60.7%
	1992	656	1997	404	61.6%
	1993	771	1998	398	51.6%
	1994	741	1999	497	67.1%
	1995	744	2000	464	62.4%
	1996	803	2001	460	57.3%
	1997	761	2002	466	61.2%

Birth Data

Birth Profiles by Zip Code - Microsoft Internet Explorer

Address: <http://www.dhs.ca.gov/hsp/hsh/ohs/Publication/ZipCodeTables/R2ZipOrder.htm>

Welcome to **California**

Center for Health Statistics

Birth Profiles by ZIP Code

Explanation of the Data Tables (Word Document)

- Birth Profiles by ZIP Code, 2002 (Excel)
- Birth Profiles by ZIP Code, 2001 (Excel)
- Birth Profiles by ZIP Code, 2000 (Excel)
- Birth Profiles by ZIP Code, 1999 (Excel)
- Birth Profiles by ZIP Code, 1998 (Excel)
- Birth Profiles by ZIP Code, 1997 (Excel)
- Birth Profiles by ZIP Code, 1996 (Excel)
- Birth Profiles by ZIP Code, 1995 (Excel)
- Birth Profiles by ZIP Code, 1994 (Excel)
- Birth Profiles by ZIP Code, 1993 (Excel)
- Birth Profiles by ZIP Code, 1991 (Excel)
- Birth Profiles by ZIP Code, 1990 (Excel)

Step #3: Students from New Development

SMITH SCHOOL DISTRICT DISTRICT-WIDE RESIDENTIAL DEVELOPMENT SUMMARY

July 8, 2003

Total SFD = 8,100 Total MFA = 1,650 Total APT = 963 Total All Units = 10,713

Study Area	YEAR 1			YEAR 2			YEAR 3			YEAR 4			YEAR 5			Total		
	SFD	MFA	APT	SFD	MFA	APT	SFD	MFA	APT	SFD	MFA	APT	SFD	MFA	APT		SFD	
100E	0	0	0	322	0	0	270	0	0	48	0	0	50	0	0	0	0	
100C	174	0	0	19	0	0	0	0	0	0	0	0	0	0	0	0	0	
100D	35	0	0	158	0	115	27	0	115	27	0	0	0	0	0	0	0	
109E	58	0	0	218	70	0	79	70	0	0	0	0	0	0	0	0	0	
240C	9	0	0	74	0	0	75	0	0	20	0	0	20	0	0	0	0	
309A	0	20	0	0	100	0	0	0	0	0	0	0	0	0	0	0	0	
310E	0	20	0	0	100	0	0	0	0	0	0	0	0	0	0	0	0	
313A	4	0	0	6	0	0	0	0	0	0	0	0	0	0	0	0	0	
320E	10	0	0	12	0	0	0	0	0	0	0	0	0	0	0	0	0	
338A	0	0	0	40	0	0	140	0	0	100	0	0	0	0	0	0	0	
339A	30	0	0	157	38	0	55	24	0	0	0	0	0	0	0	0	0	
360A	150	0	0	57	0	0	25	0	0	17	0	0	0	0	0	0	0	
363A	0	0	0	0	0	111	0	0	111	0	0	0	0	0	0	0	0	
365A	16	0	0	12	0	0	0	0	0	0	0	0	0	0	0	0	0	
418A	0	0	0	35	0	0	16	0	0	0	0	0	0	0	0	0	0	
435E	13	0	0	37	0	0	25	0	0	0	0	0	0	0	0	0	0	
437E	0	0	0	35	96	0	0	0	0	0	0	0	0	0	0	0	0	
439A	0	0	0	24	0	0	60	0	0	10	0	0	40	0	0	40	0	
432A	23	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
432C	0	0	0	26	0	0	30	0	0	0	0	0	0	0	0	0	0	
434A	48	0	0	27	0	0	0	0	0	0	0	0	0	0	0	0	0	
434A	8	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
438A	0	0	0	0	202	129	0	0	129	0	0	0	0	0	0	0	0	
440A	113	0	0	140	204	0	136	204	0	0	0	0	0	0	0	0	0	
440C	79	0	0	117	0	0	39	0	0	39	0	0	0	0	0	0	0	
440E	65	0	0	50	0	122	0	0	122	0	0	0	0	0	0	0	0	
450E	145	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
452A	25	0	0	6	0	0	0	0	0	0	0	0	0	0	0	0	0	
452E	33	0	9	13	36	0	0	36	0	0	0	0	0	0	0	0	0	
454A	118	0	0	266	0	0	0	0	13	0	0	0	0	0	0	0	0	
456A	0	0	0	60	0	0	60	0	0	60	0	0	60	0	0	51	0	
460E	0	0	0	0	0	0	0	0	0	0	0	0	150	0	0	150	0	
460C	0	0	0	0	0	0	0	0	37.5	0	0	150	0	0	650	200	0	
460D	0	0	0	101	0	0	63	0	0	101	0	0	0	0	0	0	0	
Total	1270	45	3	1246	107	477	1311	302	427	142	0	323	0	0	850	200	0	
	SFD	MFA	APT	SFD	MFA	APT	SFD	MFA	APT	SFD	MFA	APT	SFD	MFA	APT	SFD	MFA	APT

Total 2002/2003 = 1,324 Total 2003/2004 = 3,226 Total 2004/2005 = 1,540 Total 2005/2006 = 3,42 Total 2006/2007 = 930 Total 2007/2008 = 1,160 Total 2008/2009 = 1,211

SFD = Single Fam / Detached (w/ or w/o garage, townhomes, duplex, etc)
MFA = Multi-Family Attached (w/ or w/o garage, townhomes, duplex, etc)
APT = Apartments

Step #3: Students from New Development

Study Area	15A	Projection Date		10/15/2003				
	ACTUAL	PROJECTED RESIDENT STUDENTS						
	2003	2004	2005	2006	2007	2008	2009	2010
K	8.0	8.8	8.6	11.4	14.0	11.0	13.7	13.7
1	10.0	8.0	8.8	11.5	17.1	16.8	16.7	19.4
2	7.0	10.0	8.0	11.7	17.2	20.0	22.5	22.4
3	8.0	7.0	10.0	10.9	17.4	20.1	25.7	28.2
4	4.0	8.0	7.0	12.9	16.6	20.2	25.8	31.4
5	5.0	4.0	8.0	9.9	18.6	19.4	25.9	31.5
6	4.0	5.0	4.0	10.9	15.6	21.4	25.1	31.7
7	7.0	4.0	5.0	7.8	18.4	19.3	28.9	32.6
8	7.0	7.0	4.0	8.8	15.2	22.1	26.8	36.4
9	8.0	7.0	7.0	6.5	13.8	17.8	27.1	31.8
10	9.0	8.0	7.0	9.5	11.5	16.2	22.8	32.1
11	2.0	9.0	8.0	9.5	14.5	14.0	21.2	27.8
12	5.0	2.0	9.0	10.5	14.5	17.0	19.0	26.2
K-6	46.0	50.8	54.4	79.2	116.5	128.9	155.4	178.3
7-8	14.0	11.0	9.0	16.6	33.6	41.4	55.7	69.0
9-12	24.0	26.0	31.0	36.0	54.3	65.0	90.1	117.9

50 units X .4 K-6 SYF / 7 K-6 grades = +2.85 students per K-6 grade	↑	↑	↑	↑	↑
	50 SFD X SYF	100 SFD X SYF	50 SFD X SYF	100 SFD X SYF	100 SFD X SYF

Step #4: Mobility (modified cohort)

- Addresses in-out migration, drop-outs and private school movement
- Historical enrollment by sampling of study areas
- Avoid enrollment data in areas with past development – “double counting”

Step #4: Mobility (modified cohort)

Final Short/Medium Term Projection	Study Area 15A	Projection Date 10/15/2003							
	ACTUAL	PROJECTED RESIDENT STUDENTS							
	2003	2004	2005	2006	2007	2008	2009	2010	
K	8.0	8.8	8.6	11.4	14.0	11.0	13.7	13.7	
1	10.0	8.1	8.9	11.6	17.3	17.0	16.9	19.6	
2	7.0	10.1	8.2	11.9	17.5	20.4	22.9	22.8	
3	8.0	7.1	10.2	11.1	17.8	20.6	26.3	28.9	
4	4.0	8.1	7.1	13.2	17.0	20.8	26.5	32.4	
5	5.0	4.0	8.2	10.1	19.1	20.1	26.8	32.6	
6	4.0	5.0	4.1	11.1	16.0	22.2	26.0	32.8	
7	7.0	4.0	5.0	7.8	18.4	19.5	29.4	33.2	
8	7.0	6.9	3.9	8.7	15.1	22.0	26.8	36.5	
9	8.0	7.3	7.3	6.7	14.3	18.5	28.3	33.3	
10	9.0	7.6	7.0	9.3	11.2	16.0	22.3	31.7	
11	2.0	8.1	6.8	8.5	12.9	12.3	18.9	24.6	
12	5.0	1.9	7.7	8.9	12.9	14.6	16.4	22.7	
K-6	46.0	51.2	55.3	80.4	118.7	132.1	159.1	182.8	
7-8	14.0	10.9	8.9	16.5	33.5	41.5	56.2	69.7	
9-12	24.0	24.9	28.8	33.4	51.3	61.4	85.9	112.3	

Historical enrollment changes in non-developing areas indicate a net migration (mobility) factor of +1% for grades K-6, -1% for grades 6 to 7 and 7 to 8, +5% for 8th to 9th, -5% for 9th to 10th, -10% for 10th to 11th and -5% for 11th to 12th

Long-Term Student Estimate “Maturation”

- Commonly referred to as “build-out”
- Useful for suburban districts with large areas of undeveloped land
- “Bigger picture” look at the District for long-term site needs and location analysis
- A separate projection method

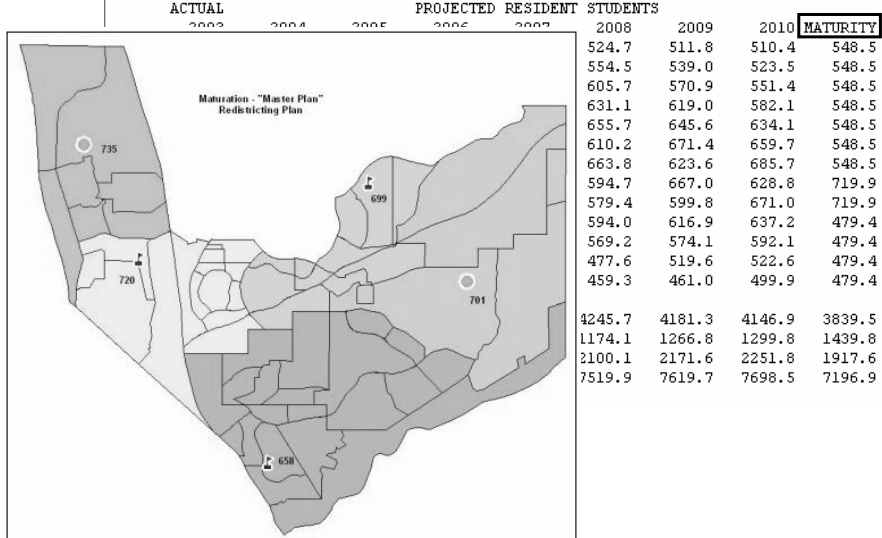
Long-Term Student Estimate “Maturation”

Study Area 15A		Projection Date 10/15/2003							
	ACTUAL		Prepared for each Study Area				2010 MATURITY		
	2003	2004	For this Study Area 15A:				13.7	32.2	
K	8.0	8.8	Existing Housing Units (164)				19.6	32.2	
1	10.0	8.1	+ Planned Units (next 7 years: 400)				22.8	32.2	
2	7.0	10.1	+ Potential Units (beyond 7 years: 0)				28.9	32.2	
3	8.0	7.1	= Total Dwelling Unit Estimate (564)				32.4	32.2	
4	4.0	8.1	X Student Generation Factors				32.6	32.2	
5	5.0	4.0		SFD	MFA	APT	32.8	32.2	
6	4.0	5.0					33.2	42.3	
7	7.0	4.0	K-6	.400	.220	.240	36.5	42.3	
8	7.0	6.9	7-8	.150	.098	.073	33.3	28.2	
9	8.0	7.3	9-12	.200	.196	.147	31.7	28.2	
10	9.0	7.6	= Target Estimate and Distribution of Future Students				24.6	28.2	
11	2.0	8.1					22.7	28.2	
12	5.0	1.9							
K-6	46.0	51.2	55.3	80.4	118.7	132.1	159.1	182.8	225.4
7-8	14.0	10.9	8.9	16.5	33.5	41.5	56.2	69.7	84.6
9-12	24.0	24.9	28.8	33.4	51.3	61.4	85.9	112.3	112.8

**Using Short Term and Maturation
Projections for the Location
and Timing of Facilities**

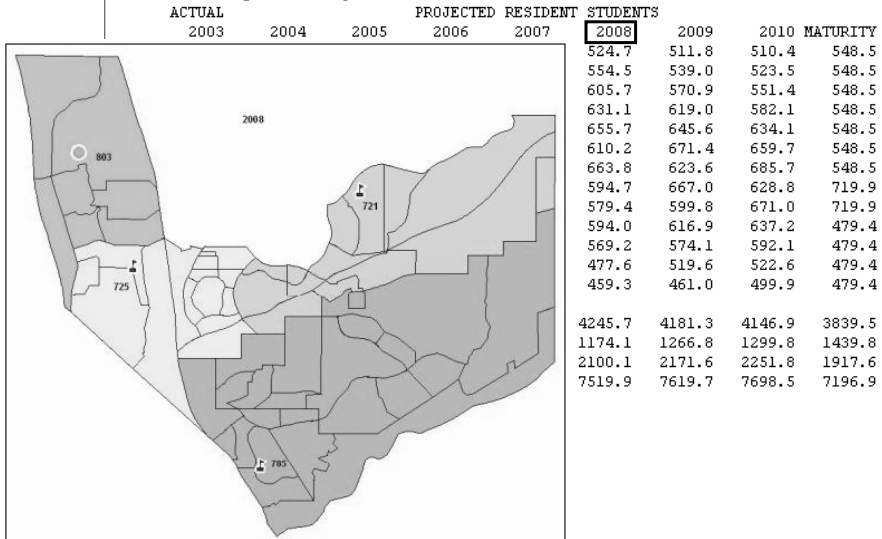
Long-Term Site/Boundary Planning

District Summary Projection Date 10/15/2003



Long-Term Site/Boundary Planning

District Summary Projection Date 10/15/2003



Summary

- Think of the uses for your projections
 - Staffing versus facility planning
 - Short-term versus long-term
 - Actual enrollment versus residence enrollment
- Determine the projection method and level of detail to fit your needs
 - Staffing versus facility planning
 - Cohort method versus residence-based using planning areas

Summary

- Be consistent with your data collection efforts
 - Collect data for smaller areas rather than by attendance zone or district-wide to understand what is happening in your District and to “protect” your data from boundary and district policy changes
 - Use the same projection date each year
- Take advantage of your IT Dept. to collect data reports each year
 - SIS will allow student reports by Study Area?
 - Have them help create useful demographic reports of your students every year