

Override Study Committee – Demographics Subcommittee
Executive Summary of Findings
July 30, 2014

The Demographics Subcommittee of the Override Study Committee (“OSC”) is primarily concerned with first identifying trends and then quantifying information, opportunities and impacts that may provide useful concepts for addressing current enrollment pressures. Other Subcommittees of the OSC examined matters concerning the feasibility, desirability and implementation associated with specific changes from the current procedures employed by the School Committee and have provided this information in their reports. Some of these concepts have been generated by other OSC Subcommittees and some on our own. Selection of which specific concepts, if any, should actually be implemented involves trade-offs and largely remains the purview of the School Committee in association with parents and the Brookline taxpayers.

DEMOGRAPHIC FACT BASE

Listed below are key observations we have identified:

1. Public Schools of Brookline (“PSB”) Enrollment Changes

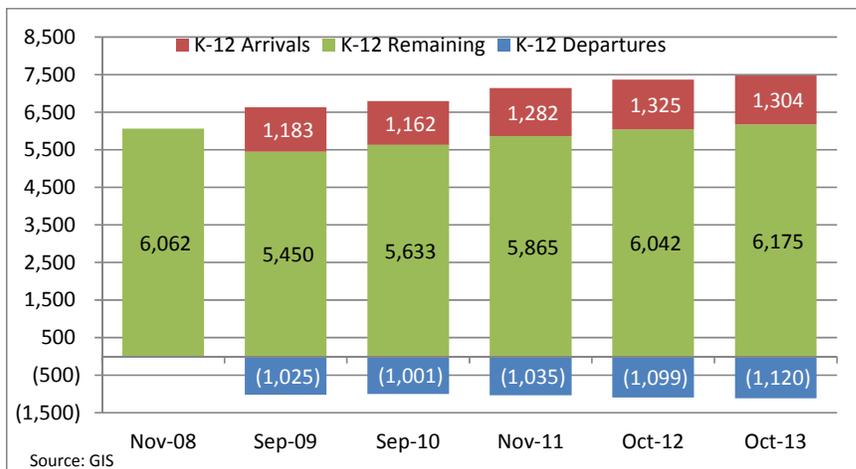
The Demographics Subcommittee reviewed and analyzed the school enrollment information from PSB and GIS and identified the following:

- A cumulative net increase of nearly 22% since 2006, about 1,250 additional K-12 students:

	2006	2007	2008	2009	2010	2011	2012	2013	2014	Growth	Annual
K	484	549	495	549	593	546	602	666	630	30%	3%
1-8	3,412	3,505	3,603	3,741	3,876	4,106	4,225	4,401	4,598	35%	4%
9-12	1,870	1,829	1,808	1,782	1,748	1,726	1,777	1,774	1,802	-4%	0%
Total	5,766	5,883	5,906	6,072	6,217	6,378	6,604	6,841	7,030	22%	3%

Source: Public Schools of Brookline

- About 1,250 new students arrive in PSB *every year* and a slightly smaller number leave (“churn”):



- Of the new arrivals to the school system, about 58% (or approximately 650 per year) are entering grades 1 through 12 and have grown at the same rate as the kindergarteners:

New Arrivals to School System

	K	1-8	9-12	K-12 Total	1-12 Total	K as %
Sep-09	442	436	164	1,042	600	42%
Sep-10	414	471	150	1,035	621	40%
Nov-11	460	518	163	1,141	681	40%
Oct-12	523	485	174	1,182	659	44%
Oct-13	492	520	159	1,171	679	42%

Source: GIS

- New arrivals into grades 1-8 impact all eight elementary schools:

Arrivals (1-8)	Sep-09	Sep-10	Nov-11	Oct-12	Oct-13
Lawrence	71	72	73	70	67
Baker	71	100	66	88	113
Devotion	79	88	79	90	91
Heath	24	25	49	24	24
Runkle	53	33	43	37	45
Pierce	63	59	89	88	91
Driscoll	30	51	46	47	41
Lincoln	45	43	73	41	48

Total	436	471	518	485	520
Min	24	25	43	24	24
Max	79	100	89	90	113
Average	55	59	65	61	65

Source: GIS

- The number of kindergarten children self-identifying as “immigrant” has more than doubled in the last 3 years (56 in 2011 to 120 children in 2013):

	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013
Other	361	399	469	418	471	499	447	504	516	469
Immigrant	34	57	44	42	35	62	61	56	107	120
Total	395	456	513	460	506	561	508	560	623	589

% Increase	2005	2006	2007	2008	2009	2010	2011	2012	2013
Other	11%	18%	-11%	13%	6%	-10%	13%	2%	-9%
Immigrant	68%	-23%	-5%	-17%	77%	-2%	-8%	91%	12%
Total	15%	13%	-10%	10%	11%	-9%	10%	11%	-5%

Source: Public Schools of Brookline

- The largest percentage increase is in the Materials Fee program, at more than 10% per year since 2006:

	FY02	FY03	FY04	FY05	FY06	FY07	FY08	FY09	FY10	FY11	FY12	FY13	FY14
METCO	301	306	290	295	304	292	294	301	302	306	305	305	297
Mat. Fee	100	110	100	107	108	106	120	136	142	146	154	171	178
	401	416	390	402	412	398	414	437	444	452	459	476	475
% Increase													
METCO		2%	-5%	2%	3%	-4%	1%	2%	0%	1%	0%	0%	-3%
Mat. Fee		10%	-9%	7%	1%	-2%	13%	13%	4%	3%	5%	11%	4%
Total		4%	-6%	3%	2%	-3%	4%	6%	2%	2%	2%	4%	0%

Source: Public Schools of Brookline

- The growth in Materials Fee has been accelerating, and exceeded METCO admissions in 2013 (23 Materials Fee vs. 20 METCO).
- The recent growth in the Kindergarten classes will produce a need to add capacity to the High School, as the current enrollment of 1,750 will gradually increase to around 2,500 (based on 4 grades of about 630 each) by 2022.
- We note that due to different data sources (GIS and PSB) and differences in the dates of the snapshots for the data sets, figures do not correlate exactly across sources; however, the trend information in each data set is consistent and clear.

2. Brookline Population Changes

The Demographics Subcommittee reviewed and analyzed the 2000 and 2010 census data and identified the following:

- Overall population grew by 2.8% (or 1,625 persons) between 2000 and 2010 to 58,732;
- Specific population segments grew much faster:
 - Population of children under 5 grew 21.6% to 3,209 in 2010 and
 - Population of children ages 5 through 19 grew 6.5% to 8,454 in 2010
- Average household size increased by 4.1% from 2.18 to 2.27 and the average number of the households with individuals under 18 grew by 4.7% from 5,805 to 6,075; and
- Brookline's growth in household size and growth the population of children significantly exceeds those of Cambridge, Boston or Newton:

	Brookline 2010 Figure	Newton 2010 Figure	Cambridge 2010 Figure	Boston 2010 Figure	Brookline Change % from 2000	Newton Change % from 2000	Cambridge Change % from 2000	Boston Change % from 2000
Under 5 yrs.	3,209	4,497	4,526	32,420	21.6%	2.2%	9.7%	1.2%
5 to 19 yrs.	8,454	18,643	12,781	103,172	6.5%	10.1%	-13.1%	-6.1%
Total (0-19 years)	11,663	23,140	17,307	135,592	10.3%	8.5%	-8.1%	-4.5%

	Brookline 2010 Figures	Newton 2010 Figures	Cambridge 2010 Figures	Boston 2010 Figures	Brookline Change % from 2000	Newton Change % from 2000	Cambridge Change % from 2000	Boston Change % from 2000
Households ("HH") with individuals under 18	6,075	10,329	7,425	58,610	4.7%	2.5%	-7.8%	-4.6%

	Brookline 2010 Figures	Newton 2010 Figures	Cambridge 2010 Figures	Boston 2010 Figures	Brookline Change % from 2000	Newton Change % from 2000	Cambridge Change % from 2000	Boston Change % from 2000
Avg. HH size	2.27	2.5	2.0	2.26	4.1%	-0.4%	-1.5%	-2.2%
Avg. family size	2.91	3.04	2.76	3.17	1.7%	0.0%	-2.5%	-2.8%
Avg. size of owner- occupied HH	2.42	2.69	2.09	2.38	1.3%	-0.4%	-3.2%	-5.2%
Avg. size of renter- occupied HH	2.12	2.09	1.95	2.2	6.0%	0.5%	-1.0%	-0.9%

3. Housing Stock Changes

The Demographics Subcommittee reviewed and analyzed data from tax assessor's office from 2003 to 2013 and identified the following:

- Using an estimation approach, the Demographics Subcommittee calculated roughly 40 net new dwelling units each year from 2003 to 2013;
- The current housing unit is 25,207; dwelling unit rate of growth is under 2%;
- Nearly 40% of our housing stock are condominiums;
- There were 1,900 condominiums created through conversion, just under 1% per year (this is not new housing stock but rather a reclassification of the type of housing stock); and
- About 56% of families with children in PSB reside in condos now, up from 50% in 2003.

4. The MIT Operations Lab Model

The Subcommittee worked closely for three month with three Sloan School graduate students, members of the MIT Operations Lab. Their stated goal was to build a predictive model which could be used by the Schools going forward by entering in current data on several key variables. Their goal was for an error margin of about one kindergarten classroom per year (+/- 20).

Due to data limitations they were unable to achieve their goal. However, their model did succeed in recreating the historic enrollment information over a 10 year period with an error rate of two classrooms. Additional improvements in data input, especially housing units created, may make this a useful predictive tool.

Their model addressed resident students only - those that the PSB are mandated to serve - and for 2014 indicated a range from low of 584 to a high of 630. Their intuition was that a low/middle prediction was more likely than a high one. Note that current PSB projections of resident students total 590.

FACTORS TO CONSIDER WHEN ADDRESSING ENROLLMENT GROWTH

Several factors should be considered in addressing the surge in enrollment growth:

- New buffer zones, implemented in July 2012, doubled the number of new arrivals to PSB residing in buffer zones from 16% to 34%;
- New buffer assignments were first evident in Fall 2013 (one year of experience) and reduced required classrooms by more efficiently assigning students to empty seats;
- Churn varies significantly from school to school depending on the type of housing stock of their student domiciles: those drawing from Ones, Two and Threes (OTT) are twice as stable as those drawing from multi-unit buildings (including condos);
- Current average class size is 21.14, up from 19.47 ten years ago;
- There are 480 non-resident students currently (METCO and Materials Fee);
- Based on the current school policy of maximum class sizes of 24 in K-3 and 25 in grades 4-8, PSB has some 800 seats theoretically available in existing classrooms, including 83 classrooms that currently have 20 or fewer students. The School Committee should review its school assignment policies (e.g., sibling assignment, neighborhood assignment, etc.) and their effect on utilizing these seats.
- The impact of adding 1 to 2 children per classroom in the K-8 system is equivalent to reducing classroom demand by 10-16 classrooms; the lower figure could potentially be achieved over a five year period (Fall '14 to Fall '19) utilizing the now doubled buffer zones and the better understood annual turnover (or churn) of nearly 700 students and the 630 incoming kindergartners each year, without additional busing, and continuing in place policies for siblings, language programs and appropriate classroom educational groupings.

PREDICTING THE ENROLLMENT GROWTH

Several factors impact the ability to predict enrollment growth:

- The MGT population projections have been right to date (two years), but are based on an unreliable model that cannot be used to predict enrollment growth; and
- The new MIT model may provide a better predictive tool if accurate data for net new housing units can be provided.
- Some trends, such as rising house prices, decreasing turnover (as evidenced by reduced inventory), rising taxes, larger schools, limited new residential growth, a recent decline in the rate of growth of new condominiums (and an eventual end to the units available for condo conversion), and a decline in the child-bearing age population, may all point to a future enrollment reduction.
- Other trends, including an apparent increase in in-migration from other cultures and countries, increases in household size, continuing desirability for reduced car dependence (including walk to work, good access to public transit), increased child-care and pre-school availability (which supports double wage earner households), and a diverse community with a school system recognized for quality education may all point to further enrollment increases.
- Making capital decisions, which generally require a 5 year time horizon and a 25 year debt service commitment, requires confidence in enrollment projections that should look out at least 10-15 years. The Town does not have such information currently. The Demographics Subcommittee has pointed out both the lack of such information and several methods to gain this data.
- The Subcommittee is unable to provide guidance on future enrollment figures until the certain questions section has been addressed (Refer to the Questions to be Answered Section below)

QUESTIONS TO BE ANSWERED

The School Committee should consider the following questions:

1. Where is the student growth occurring in the next few years by district and buffers?
2. Where will it likely be in the next 10 years?
3. What recommendations can be made concerning the optimal location of future new classrooms?
4. Are recent trends in condominium production and international migration likely to continue and what are the consequences to enrollments if they do or don't?

OPTIONS TO ADDRESS ENROLLMENT

The Demographics Subcommittee has identified the following options:

1. Assignments to schools could be made later in the year when more information is known about the number new arrivals and where the students live.
2. Assignment of non-resident students, and a final decision as to how many should be admitted, could be deferred to the latter half of August or at such other date as the parameters of the entering kindergarten cohort for the coming school year are known with reasonable certainty.
3. Buffer zones could be modified to respond to variations in the churn factors at each school.
4. The School Committee should reexamine what could be an important useful impact of the July, 2012 Buffer Zone changes. (We point here to the change from 16% to 34% in the number of arriving resident students now residing in Buffer Zones, allowing greater flexibility in classroom assignment. The September, 2013 Expand In Place decision was made before these changes could be evaluated; the full impact of these changes requires 5-6 years of placements.)
5. Improved data tracking could be done (e.g., during the School's student intake process or by Town Building Department or Assessor personnel):
 - new housing units;
 - student family arrival reasons and locations;

- student family registration and number of siblings;
- student family departure reasons and locations;
- pre-school enrollment figures; and
- population migration in and out of Brookline.

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