Name of Committee: **OSC Demographic Subcommittee**

Meeting Date:  January 22, 2014  Time:  4:30 pm

Meeting Location:  Town Hall – Room 310

Members Present:  Alberto Chang; Sergio Modigliani; Lee Selwyn; Ann Connolly Tolkoff (chair)


Topic: Prior Meeting Minutes

The minutes from January 8th and January 15th meetings were approved.


Topic: Preparation for MGT Meeting

The Demographic Subcommittee discussed and drafted a data request to MGT of America, Inc. ("MGT") and Mr. Edward Humble, Ph.D., Vice-President, Education and Facilities and Master Planning Expert in order for them to provide information to us for our review before we meet with Ed Humble (of MGT) next week telephonically ("MGT Data Request").

The MGT Data Request (Attachment A) will be emailed to Peter Rowe by Anne Connolly Tolkoff.

The Demographic Subcommittee determined that we would like Dan Schmitd to participate on the January 29, 2014 call given his role, responsibilities and his contribution to the MGT reports. Ann Connolly Tolkoff will follow up with Peter Rowe regarding this.


The meeting was adjourned at 5:50 p.m.

The next meeting for the Demographic Subcommittee is on January 29, 2014, at 4:30 pm (Room 310).

**Questions for MGT of America, Inc. ("MGT") and Mr. Edward Humble, Ph.D., Vice-President, Education and Facilities and Master Planning Expert**

*The Demographic Subcommittee of the Override Study Committee would like the responses, and in particular the data requested, prior to our call on January 29, 2014.  This way we will be able to review the data and ask more specific and/or follow-up questions during the call.*

*Note for all spreadsheet and data requests below, we would like to see the spreadsheet with formulas (we do not want either a PDF of the spreadsheet nor an Excel spreadsheet where formulas have been replaced by cell values.  If possible, we would like you to identify the source(s) of any input data that MGT has relied upon in any of your analyses.).*

**Data Request:**

A.  Background: Peter Rowe has informed us that MGT had actually provided an earlier model that projected a school enrollment figure lower than the actual enrollment.  After this initial model and discussion with Peter, MGT subsequently selected a model with different weightings, affording "cohort survival" substantially greater weight than any other factor.

Request #1:  Please provide the earlier model (<u>in the form of a spreadsheet with formulas</u> (not PDF, not just values).

B.  On page 21 of the MGT report, "The Public Schools of Brookline - Enrollment, Capacity, and Utilization Study - Final Report" dated March 29, 2012 and April 2, 20120, MGT discusses its Enrollment Projection Methodology. MGT uses four "base" models - Average Percentage Annual Increase, Cohort Survival, Linear Regression, and Student-per-Housing Unit.

*"The Average Percentage Annual Increase Model calculates future school enrollment growth based on the historical average growth from year to year for each grade level. This simple model multiplies the historical average percentage increase (or decrease) by the prior year's enrollment to project future enrollment estimates."*

Request #2:  Please provide the spreadsheet containing the data that was used for this model, and indicate the range of years that was used in this model.

C.  With respect to the Linear Regression Model,

*"The Linear Regression Model uses a statistical approach to estimating an unknown future value of a variable by performing calculations on known historical values. Once calculated, several future values for different future dates can then be plotted to provide a "regression line" or "trend line".  MGT has chosen a "straight-line" model to estimate future enrollment values, a model that finds the "best fit" based on the historical data."*

Request #3: Please provide the standard regression output (e.g., r-square, *t*-statistics for each coefficient and for the intercept term, F statistic, Chi square, correlation matrix, etc.). Identify each of the explanatory variables in the model. Identify the dependent variable. Indicate the range of years for the data used to evaluate the model. Please provide all input data sufficient to permit us to replicate regression results. If several alternate model specifications were considered, please provide the input data and regression results for each, and indicate the basis upon which the final model specification was selected.

D. With respect to the Cohort Survival Model,

*"The Cohort Survival Model calculates the growth or decline in a grade level over a period of ten years based on the ratio of students who attend each of the previous years, or the "survival rate". This ratio is then applied to the incoming class to calculate the trends in that class as it "moves" or graduates through the school system"*

Request #4: Please provide the input data used to calculate survival rate (and the spreadsheet for the model). Identify the source(s) for all such input data. Identify the range of years for the data used in the study. Was it limited to cohorts for which you had complete enrollment data through their full 13 years (K-12)? Or was it less than the complete K-12 range for some or all cohorts? Is your analysis focused only on net year-over-year changes or K through 12 net changes? The MGT report suggests that cohort stability may not be sustainable in situations of rapid enrollment growth. In view of the fact that this condition applies to Brookline post-2006, what specific data or analysis did you rely upon to establish that the use of cohort survival for the post-2006 period in Brookline is valid?

E. With respect to the Students-per-Household Model,

*"The Students-per-Household Model utilizes the estimated number of households as its base data. Using the housing unit data and historical enrollment data, MGT created a student generation factor for each projected housing unit. By taking the total enrollment by grade level and dividing it by the current housing levels, a student generation factor (SGF) was calculated for each grade level. This factor indicates the number of students within each grade level that will be generated by each new housing unit."*

Request #5: Please provide data and the underlying spreadsheet used for this calculation. Please identify all data sources. In the context of your study, to what does the term "building permits" refer – i.e., is it limited solely to new housing units, or does it include other types of residential construction? What criteria did you use to select the specific building permits to include in your analysis? Did MGT investigate and disaggregate the building permits by type of unit or type of project? Did MGT distinguish between a permit for renovating a kitchen, for example, vs. new construction? Confirm the specific process by which MGT assigned students per new housing unit and distributed these among the 13 grades based on the building permits. What data does

MGT have to support the assumption that the distribution by grade in the newly constructed housing units is identical to the distribution by grade town-wide?

F. In the 2012 MGT report dated April 2, 2012, Exhibit 1-24 identifies 6 sensitivity models (A through F). MGT states that it selected model D, which had assigned 85% weighting to cohort survival. There are four inputs to each model: cohort survival, linear regression, student per household and average percentage growth.

Request #6: What specific criteria (quantitatively or qualitatively) did MGT use for the evaluation among the six alternative models? What specific basis was relied on for the selection of model D – i.e., what specific quantitative and/or qualitative criteria were used by MGT for the selection of D and the rejection of the other five models?

Additional Questions:

G. In hindsight, what modifications would MGT make in the methodology it applied for the Brookline enrollment forecast? What other data would help to produce a more precise forecast?

H. Brookline has experienced several student population spikes followed by decreases over the past several decades. Is the any aspect of the MGT work that would support the notion that the persistent growth being forecast for the next several years will be sustainable over the 20-25 year life of proposed school expansion projects? Is it reasonable or unreasonable to expect that the kinds of student population swings that Brookline has experienced in the past will reoccur in the future?