A Cost-Benefit Analysis of School Regionalization in Massachusetts
## Interactive Qualifying Project

Submitted by:

Alexander J. Alvarez

Dimitri Loucagos

Sabbir Rashid

Submitted to:
Project Advisors: **Prof. Susan Vernon-Gerstenfeld, Prof. Alexander Wyglinski**
On-Site Liaison: **State Representative Anne Gobi, 5th Worcester District**

15 October 2010

A Cost-Benefit Analysis of School Regionalization in Massachusetts

Interactive Qualifying Project

Sponsor: Massachusetts State Representative Anne M. Gobi

Submitted to:

On-Site Liaison: State Representative Anne M. Gobi

Project Advisors: Susan Vernon- Gerstenfeld, WPI Professor

Alexander M. Wyglinski, WPI Professor

Submitted by:

Alexander J. Alvarez

Dimitri Loucagos

Sabbir Rashid

Date: 15 October 2010

Abstract

Due to the recent economic crisis and the increasing costs in education, the need for cost efficient methods of maintaining education has been crucial in the state of Massachusetts. In order to verify whether or not school district regionalization is a viable solution to the education budget crisis in the state, a cost-benefit analysis was conducted to determine the social and fiscal implications of school consolidation in the sample frame, Worcester County. Several hypotheses based on arguments established in our literature review were tested. This was done primarily by data-driven research and replication of research models to compare and find correlations between various socioeconomic indicators. Furthermore, the General Laws of Massachusetts and current legislature regarding regionalization were reviewed, leading to the endorsement of a legislative bill and recommendation to reevaluate the current education funding formula.

Authorship

Acknowledgements

Contents

Figures

Tables

Executive Summary

The price of education is ever increasing. In Massachusetts, there will be a projected budget

gap of 2.7 billion dollars for the Fiscal Year 2011 (See Table 1; Johnson & McNichol, 2010).

Table 1: Gaps States Have Faced In FY2011 [Massachusetts]

**Note: The data on FY2011 state budget cuts are adapted from: Johnson, J. & McNichol, M. (2010).
Recession continues to batter state budgets; state responses could slow recovery. Center on Budget and Policy
Priorities. Retrieved April 20, 2010 from http://www.cbpp.org/files/9-8-08sfp.pdf**

	Pre-Budget Adoption Gap in States with Biennial 09-11 Budgets	Pre-Budget Adoption Gap in States with Annual Budgets/New Gap in Biennial States	Total FY11 Shortfall Closed When Budget Adopted	Total Shortfall as Percent of FY11 Budget
Massachusetts	0	$2.7 billion	$2.7 billion	9.6 %

Due to this, effective measures for cost-savings in education are constantly being taken into

consideration. The recent economic crisis has urged officials to start strategically planning for the

future and finding methods for cost savings. School consolidation is one such method that has

historically provided savings for administrators, as well as the Massachusetts taxpayer (Streifel,

Foldesy, & Holman, 1991).

The goal of our research project was to determine the social and fiscal costs and benefits of

school consolidation. To achieve our goal, we studied the effects of consolidation on teachers,

parents, students, administrators, and taxpayers by gathering data from annual educational budget

reports for the school systems in Worcester County. Worcester County had been chosen as our

sample frame due to similar population density and socioeconomic statistics as our sponsor

Representative Anne Gobi's district, most of which is included in Worcester County. Furthermore,

we conducted interviews with several school officials and committee members.

Every parent and teacher wants the best education possible for their high school students.

Every taxpayer and administrator wants more return for his or her dollar. Every student wants to

have a satisfying high school experience, consisting of an enjoyable time while gaining knowledge. To achieve most of these benefits, Massachusetts has historically turned to school consolidation, the combining of two or more schools or districts in a certain region into one regionalized school or district (Streifel, Foldesy, & Holman, 1991).

Originally, school districts were created by local parents and teachers in order for neighborhood students to gain an education and ultimately become productive members of society. This resulted in separate districts for every area with teachable children. Over time, however, the control of education shifted to the government and higher authorities, which resulted in a reduction of the total number of districts. Nevertheless, due to many people's fears that taking away educational control from local decision makers would reduce the quality of education, regionalization has been a time-consuming and uncertain process.

We utilized several methods of collecting and analyzing data in order to achieve our goal. We began by collecting data traditionally used to measure academic performance from the Massachusetts Department of Elementary and Secondary Education website, which proved to be the most recent and accurate source of this information. These data included statistical records of student-teacher ratios, teacher quality data, student SAT and MCAS scores, graduation rates, and per-pupil spending, as well as socioeconomic data such as percent minority, percent free or reduced lunch, student to computer ratio, and median income. These data was used to test five hypotheses that were made based on our literature review. Once the set of hypotheses were tested, we explored the fiscal constraints and advantages in consolidation by conducting interviews with various school administrators and committee members.

The first hypothesis stated that regionalized school districts will have a higher total SAT test scores than non-regionalized districts. In evaluating the Worcester County data that we

had collected, we found that regionalized school districts have an average total SAT score of 1536.6 while non-regionalized school districts have an average total SAT score of 1504.7. The standard deviation in test scores was 92.18 point, so the difference of 31.9 points in average total SAT score was less than one third of a standard deviation. This difference was not great enough to be statistically significant, so we were not able to find support for this hypothesis. **Not Supported.**

The second hypothesis stated that schools representing a larger student population will result in lower per pupil spending than schools representing a larger population. When comparing per pupil spending with the number of students in a district, we found very little correlation, and that only 3.1 percent of the variation in per pupil spending dollars is explained by the variation in number of students. A plot of this data is shown below (See Figure 1). We were therefore able to reject the hypothesis. **Not Supported.**
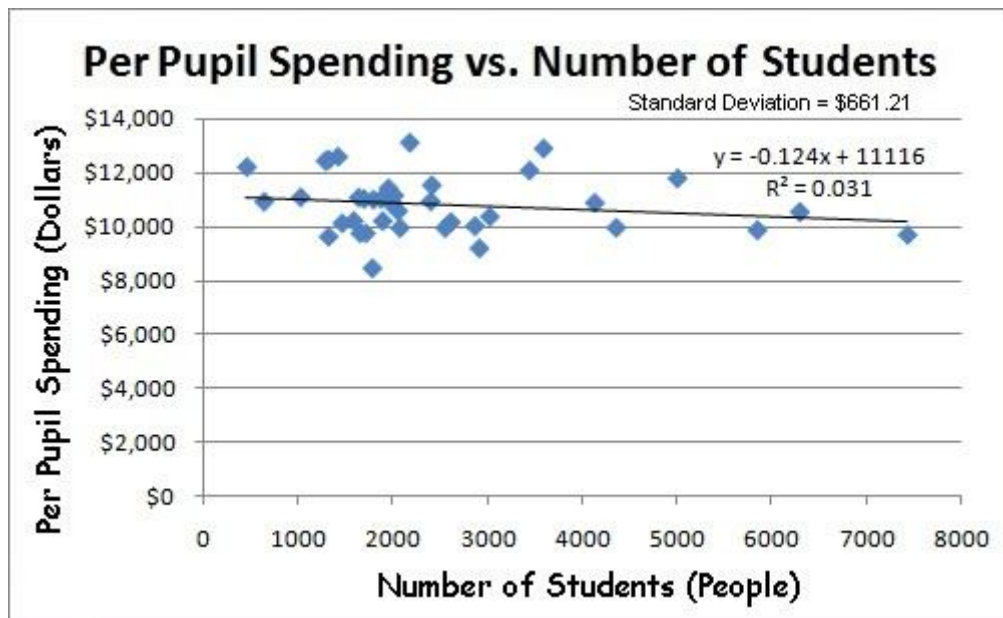
Figure 1: Per Pupil Spending vs. Number of Students

The third hypothesis stated that regionalization of school districts will result in larger student to teacher ratios than non-regionalized school districts. We were able to reject this

hypothesis in finding that non-regionalized school districts in Worcester County had an average student-teacher ratio of about 14.52, while regionalized school districts in Worcester County had an average student-teacher ratio of 13.9. **Not Supported.**

The fourth hypothesis stated school districts with a larger student population will also represent a higher total SAT score than school districts representing a smaller population. A plot of the total number of students in Worcester County school districts and total SAT score in those same districts showed that only 0.2 percent of the variation in average total SAT score is explained by the variation in number of students. There is almost no correlation between the two, as shown below (See Figure 2), so we are able to reject the hypothesis. **Not Supported.**
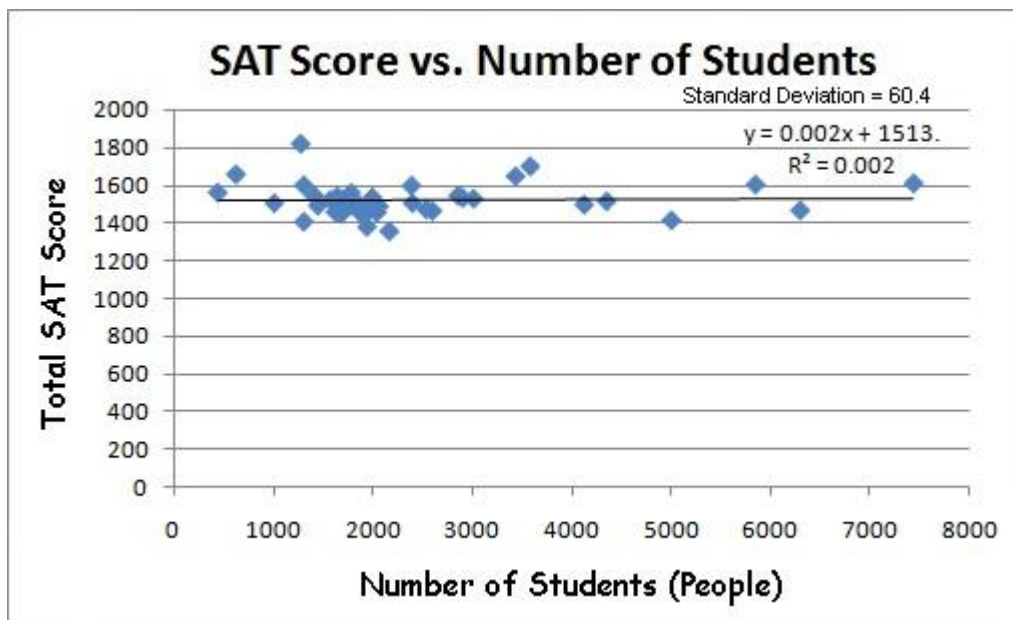
Figure 2: Total SAT Score vs. Number of Students

The fifth hypothesis stated that school districts in Worcester County that represented a smaller student population would also represent a higher graduation rate. However, due to

the R-squared value of .002, graduation rate was found to be unrelated to student population size, allowing us to reject the hypothesis. **Not Supported.**

The final hypothesis stated that housing values in districts containing regionalized schools will be greater than housing values in non-regionalized districts. After replicating a study conducted in New York comparing housing values of consolidated and non-consolidated districts, we found that regionalized school districts in Worcester County had a greater average median housing value than non-regionalized school districts in Worcester County. The difference in housing values in these two types of districts was about an eight of the average standard deviation. This difference is not great enough to be statistically significant. **Not Supported.**

In conclusion, we were unable to find support for any of the hypotheses that had been created based on our background information. This led us to believe that there is much misunderstanding of school regionalization. In order to better address the problems of school districts in Massachusetts that are looking to improve, local studies of potential consolidation candidates must be undertaken. This can be done through the endorsement of Massachusetts State House Bill Number 4754, which would eliminate a major stumbling block in the process of school district regionalization by clarifying a law that would reconcile teacher contracts in newly regionalized school districts through a collecting bargaining process, authorize the creation of the Regionalization Advisory Commission, and require that the Commissioner of the Department of Elementary and Secondary Education conduct an analysis of the sustainability of school districts in the state with an enrollment of fewer than one thousand students.

Chapter 1: Introduction

A good education has become vital for obtaining a comfortable standard of living. The 2004 U.S. Census Bureau report found that workers without a high school diploma earned an annual average of $18,734 dollars, while high school graduates made $27,915 dollars a year (Bergman, 2005). Having a high quality education is almost a prerequisite in competing for the highest paying jobs in today's economy. School consolidation has been a popular method for improving the quality of education for students. A 2009 Massachusetts Department of Education report stated that school consolidation has historically been touted as an effective method for producing cost-savings within the state's 329 school districts (Carleton, Lynch, & O'Donnell, 2009). However, the report goes on to say that consolidation has historically been a slow and cumbersome process in the state due to fears that surrendering local control of academic institutions would lead to a lower quality of education.

Despite efforts by the state government to provide a quality education for all its citizens, Massachusetts has a limited amount of taxpayer revenue with which to work every fiscal year. According to a new study published by the Center on Budget and Policy Priorities, there will be a projected budget gap of 2.7 billion dollars in the state for Fiscal Year 2011 (Johnson & McNichol, 2010). With these facts in mind, costs saving strategies like school consolidation are one of the areas legislators have identified to provide beneficial savings to the Massachusetts taxpayer. Massachusetts K-12 enrollment is projected to decrease from 959,000 in 2009 to 885,000 by 2019, putting more fiscal pressure on small school districts that face higher per pupil spending. Small districts of fewer than 1,500 students have been shown to have higher median per pupil expenditure in Massachusetts than larger ones. Johnson & McNichol (2010) caution that a significant drawback to the school

consolidation movement has been the lower rate of cost-savings in schools districts larger than 6,000 students.

One of the leading education reformers of the early twentieth century, Columbia Professor Ellwood Cubberley, has been credited as the founder of the school consolidation movement (Berry & West, 2008). He proposed three core advantages to larger school districts, which would pave the way for future school consolidation legislation. At the root of Massachusetts school consolidation was the 1949 Regional Schools Act, which encouraged small towns to consolidate. This Act significantly decreased the number of school districts from 390 to 355 over the ensuing twenty years (Carleton, Lynch, & O'Donnell, 2009). Carleton, Lynch, & O'Donnell state that the next major milestone was the formation of K-12 school districts in the 1960's and the creation of the first regional secondary schools. However, school consolidation in Massachusetts did not gain traction until 1974, when the state's Chapter 71 education laws were changed to provide financial incentives to regionalize school districts. Of the 208 K-12 school districts in Massachusetts, thirty-one have become regionalized.

To better understand the context of recent educational reform in the state, the social and financial implications of school consolidation must be fully understood. A 2009 Massachusetts Department of Education report called for additional research to be done on the effects of school consolidation for the current public education system (Carleton, Lynch, & O'Donnell, 2009). In his Readiness Project Report, Massachusetts Governor Deval Patrick identified school consolidation as a viable method for cost savings and recognized it as a long-term goal for fiscal security (Young, 2008). The recent economic crisis has prompted state and local officials to start strategically planning a route forward for determining whether school consolidation in the state is a feasible method for cost savings (McArdle, 2009).

The goal of our research was to determine the social and fiscal benefits and costs of school consolidation. In order to accomplish this goal, we identified five affected groups to study: teachers, parents, students, administrators, and taxpayers. We have studied different consolidated and non-consolidated school districts throughout Worcester County, gathering data through interviews, secondary sources from scholarly research articles, and the Massachusetts Department of Education databases. This project provides recommendations about potential school consolidation to our project sponsor, State Representative Anne Gobi, and provides a cost-benefit analysis of the topic to the Massachusetts state legislature as well as the school districts we have studied.

Chapter 2: Background/Literature Review

Our project goal is to complete a cost-benefit analysis of regionalizing versus not regionalizing school districts in the state of Massachusetts. In this chapter we will examine what school consolidation means and provide examples of why school districts have and have not decided to consolidate in the past. We will also discuss the potential and actual impacts of consolidation on everyone who is involved in the process. This includes administrators, teachers, parents, students, and taxpayers.

DEFINITION OF SCHOOL CONSOLIDATION

School consolidation refers to the merger of two or more schools into a single school district, usually larger in size than the individual schools. It is the practice of combining two or more schools for educational or economic benefits (Nelson, 1985). Benefits include the ability to offer an expanded curriculum and a more prominent identity in the community, while reducing costs through economies of scale. Negative impacts of school consolidation include reductions in parent-teacher involvement and closeness of faculty-administrator relationships, more tension between teachers and students, and more effort spent on disciplinary problems.

Table 2: Benefits of Regionalization/Non-Regionalization

Benefits of Regionalizing District	Benefits of Not Regionalizing District
Fewer classes are dropped due to low enrollment	Communities keep their sense of identity
Sharing of curriculum and activities	Smaller student to teacher ratio
Expenditures are reduced because • maintaining duplicate facilities becomes unnecessary • fewer teachers need to be hired • fewer administration are required	Increased opportunities for relationships to be created between students and teachers, and between faculty members and administration
More money to spend on highly qualified teachers	Higher administrative productivity
Higher test scores	
Lower per pupil spending	

WHY CONSOLIDATION OCCURS: HISTORICAL EXPLANATIONS

In an effort to understand the opportunities and obstacles behind school district consolidation, Sarah Carleton, Christine Lynch, and Robert O' Donnell (2009) first researched the history of the school system in the state of Massachusetts. In colonial times, families willing to provide education for their children and other children in the area established districts. This resulted in an increase in the number of districts in the state to up to 2,250 districts. When a state law in 1882 was passed that consolidated districts by giving authority only to municipalities to fund and manage school districts, the number of districts in Massachusetts decreased. Nevertheless, with 351 towns

and cities in the state, local control has meant that a large number of school districts still existed, relative to the state's student population.

In 1949, the Regional Schools Act authorized the regional district as an independent legal entity to encourage small towns to form consolidated school districts with neighboring towns (Carleton, Lynch, and O' Donnell, 2009). Rather than the number of districts shrinking over the next 20 years, the number of school districts increased from 355 to over 390. This resulted from small towns preserving independent elementary districts while creating regional secondary schools.

When Chapter 71, the state's regional school law, was amended in 1974 to expand financial incentives for districts to regionalize, progress towards consolidation began (Carleton, Lynch, and O' Donnell, 2009). One such incentive was aid being given to schools based on enrollment. Though these reforms resulted in a decrease in the number of school districts, with the 1990s passage of the Massachusetts Education Reform Act, such aid was cut off and only thirteen new K-12 regional districts have formed since. There are currently 329 school districts in Massachusetts.

IMPACTS OF CONSOLIDATION

There are many financial and educational benefits in regionalizing school districts. Consolidation allows regions to share their curricula and facilities, which results in expanded course offerings where fewer classes are dropped due to low enrollment (Nelson, 1985). Programs that originally could not have been maintained in separate schools are more manageable once the schools merge. Districts such as Harwich and Chatham, or Ayer and Shirley considered regionalizing in order to improve and expand their educational programs (Carleton, Lynch, and O' Donnell, 2009).

Furthermore, expenditures are reduced for several reasons (Nelson, 1985):

- Maintaining duplicate facilities becomes unnecessary.

- Fewer teachers need to be hired.

- Fewer administrative personnel are required than if the school districts remain separate.

There are also psychological benefits to regionalization. Schools gain a new sense of identity, while sports programs and extracurricular activities prosper from combined funding (Nelson, 1985).

Nevertheless, the impacts of regionalization are not all positive. Unlike larger schools, a smaller school size increases opportunities for relations to be created between students, faculty and administration (Nelson, 1985). In addition, a smaller student-teacher ratio, usually found in smaller schools, allows for a greater chance of more individualized instruction.

Administrators

One of the fundamental arguments for consolidation is the notion that it would save valuable resources by centralizing various academic services. One of the largest cost drivers in an average school budget comes from administrative costs (Berry & West, 2008). A comprehensive national study of regionalized schools found that each state saved twenty percent of average administrative costs by consolidating schools (Streifel, 1991).

This study showed that significant savings were seen only amongst regionalized school administrative costs. During the timeframe of this study, per pupil costs had inevitably increased. However, the regionalized school administrative costs increased by an average of only ten percent, a value twenty-one percent less than those state schools that did not re-organize (see Table 3 below).

Table 3: Administrative Costs: Regionalized District vs. State

Note: The data on school regionalization are adapted from: Streifel, J. S., Foldesy, G., & Holman, D. M. (1991). The financial effects of consolidation. Journal of Research in Rural Education,7(2), 13–20. Retrieved March 26, 2010 from http://scripts.cac.psu.edu/dept/jrre/articles/v7,n2,p1320,Streifel.pdf

Location	Consolidated District			Entire State		
	Pre	Post	% Change	Pre	Post	% Change
Arkansas #1	92	96	4	86	112	30
Arkansas #2	75	95	27	80	104	30
Arkansas #3	132	197	49	96	125	30
Arkansas #4	114	126	11	96	125	30
Arkansas #5	98	112	14	96	125	30
California #1	181	176	-3	115	153	33
California #2	186	204	10	125	145	16
Iowa	159	211	33	83	99	19
Kentucky	30	30	0	36	46	28
New York	118	115	-3	86	120	40
North Carolina #1	138	175	27	152	201	32
North Carolina #2	112	147	31	124	162	31
Oregon #1	98	130	33	206	303	47
Oregon #2	17	37	118	182	274	51
Tennessee #1	109	47	-57	33	42	27
Tennessee #2	69	50	-28	28	35	25
Texas #1	489	469	-4	259	324	25
Texas #2	417	424	2	259	324	25
Washington	404	481	19	371	466	26
Averages	**159**	**175**	**10**	**132**	**173**	**31**

Larger institutions would reduce the ratio of administrators and school officials to teachers, allowing institutions to spend the savings on more highly specialized teachers. Early studies on school quality during the 1970's concluded that larger schools consistently were found to have more qualified teachers, a result of the decreased administrative costs.

A 2004 study of the school districts in Marin County, California, examined the area's nineteen school districts serving approximately 30,000 students (Marin County Public Schools,

2004). In a wide-ranging comparison of the regionalized and non-regionalized schools of the area, it was found that there was an overall decrease of three percent in administrative costs amongst consolidated schools. The study concluded that the number of students in a school district did not necessarily correlate to an increase in the school budget spent on administrative staff but rather depended on assessments from academic staff. Small school districts were found to spend a larger amount on administrative costs because of the high salary structure, which resulted in administration accounting for a larger percentage of the overall school budget.

Some of the negative administrative consequences most frequently associated with consolidated school districts involve the social aspects of the studied institutions. Administrative productivity was lower amongst schools with larger enrollment, which was found to be mainly caused by a lack of positive attitude towards job execution (Andrews (2002); Duncombe, & Yinger, (2007)). A review of landmark school consolidation research from 1985 to 1999 identified several social patterns when administrations had been consolidated. Smaller school districts have produced a much better atmosphere for administrators and staff in general because there is less standardization of rules and procedures within the academic institution. School administrators at decentralized schools have also been more effective at promoting parental cooperation and communication due to added schedule flexibility and an increase of time for parental suggestions.

Teachers

There are many factors that need to be taken into consideration when analyzing how effective teachers are at educating their students. According to Anderson, Brewer & Goldhader (1999) and Rowe (2003), two factors that are important to address are how qualified teachers are to teach in their respective subjects and how high the student-teacher ratio is in a given school district. Both of these factors can be impacted by school district consolidation.

According to Hoxby (2000), there is a national movement to reduce class sizes. Parents like smaller classes because, based on their own experience in handling children, if there are fewer children to handle, the teacher will be able to give more time and effort to each child. Teachers like smaller class sizes because it allows for more individualized instruction. However, a study conducted by Strauss & Sawyer (1986) concluded that schools employing better qualified teachers will be more effective in interacting with their students than if they reduced class sizes. According to Darling-Hammond (1999), state reported class size data do not take into account all variables in the student's learning environment, so these data do not provide a clear picture of the effects of class size on student education.

The main objective of regionalizing schools is to become more fiscally efficient. School districts that decide to regionalize with another district may potentially find themselves with more money that they can spend on teachers with higher qualifications (Streifel et. al, 1991). However, Streifel, et. al, (1991) also explains that a main argument against regionalization is the notion that there must be an increase in teacher salaries through the adoption of the highest pay scale of all districts involved in the process. As a result, school districts exploring the idea of regionalization start out with a significant increase to their overhead costs. This factor alone will often deter schools from continuing the regionalization process. Conversely, an article from the Massachusetts Department of Elementary and Secondary Education detailed that Massachusetts teachers do not need to be immediately be paid more, but that teachers could not make less than what they had been making before the school districts merged (2010).

Parents

Parents play an integral role in developing students into multifaceted learners. In many cases, Greenwood & Hickman (1991) argue, parents can both help and hinder the teacher's ability to educate their child. As eligible voters, they possess the power to make important decisions in their communities that decide the direction of their local school districts and consequently decide what type of educational resources their children are provided with. Parents take many philosophical and monetary factors into account make when considering the issue of regionalization, a decision that is ultimately a personal one and that takes into account the best interests of their school-age children.

In some cases, regionalization of school districts will deter parents from enrolling their children. For example, Zimmer & Jones (2005) state that under a system of equalized funding, regionalized school districts will no longer be able to meet the strong education demands of wealthier families. Downes & Schoeman (1998) and Augenblick & Rooney (2009) argue that these circumstances can lead to parents pulling their students out of public schools in favor of private institutions. However, Burtless (1996) and Eide & Showalter (1998) argue that there is no correlation between per-pupil expenditure and student achievement. This argument applies to students while they are still in high school. It does not account for what happens after they leave their secondary institutions.

One aspect on the issue of school consolidation that has affected many communities' decision to regionalize has been the struggle to maintain local control of Massachusetts' school districts (Carleton, Lynch, & O'Donnell, 2009). There are currently 277 non-regionalized school districts out of the 299 total academic school districts in Massachusetts. Voters in many of these cities and towns are eager to manage school districts through a number of ways, mostly with the control of local school committees. At the same time, many communities have looked to cut costs in

one of the most expensive areas of any school budget: school administration. These two aspects have manifested themselves in legal entities called superintendency unions, a fusion between true regionalized and non-regionalized school districts. Out of the 299 total academic school districts within the state of Massachusetts, 49 are part of superintendency unions. According to the 2009 Massachusetts Department of Elementary & Secondary Education report, a superintendency union typically allows for separate elementary school districts, which belong to the same regional secondary school district, to share one superintendent and central administrative office. Each member town of the secondary regional school district has a separate school committee to deal with the decisions within their own educational entity. They are also under the jurisdiction of the regional school committee, which only has authority to evaluate and hire superintendents. However, Carleton, Lynch, & O'Donnell argue that even though these unions create a more efficient central administrative purchasing power through greater economies of scale, they also create greater inefficiencies through added duplication of efforts.

The Tahanto Regional School District in central Worcester County includes two towns, Berlin and Boylston, but is comprised of three separate school districts merged together through a superintendency union. Even though the agreement allows for a more unified management system, Superintendent Brian McDermott and his administrative staff must duplicate every aspect of their job three times over (McDermott, B., personal communication, January 29, 2010). He is in charge of administration for Berlin, Boylston, and Tahanto School Districts. However, each one of those towns is governed by their own school committees and operates under three separate budgets. The school budget for Berlin includes one elementary school with 212 students and one elementary school with 377 students for Boylston. In a letter provided by Superintendent McDermott to the state's Regionalization Advisory Commission, he stated that he "was not able to say majority of his

time has been focused on improving student learning or instructional practices," but rather, " is spent on redundant administrative tasks and working through the challenges of managing multiple school districts."

In addition, there are other impacts that parents need to take into consideration. The deciding factor for many families looking at viable communities to start and raise a family is their rest on investment. When parents decide to move into a community, they are not only investing in the academic reputation of that school district, they are also investing in the financial upside that reputation schools will have on their residential property. School consolidation has been found to have positively affected communities mainly in terms of property values (Hu, Y., & Yinger, J., 2008). A 2008 study of the New York public education system showed that average housing prices within regionalized school districts increased by significant percentages, depending on the total number of students enrolled (See Appendix L).

Researchers studied data collected over a ten-year period in 228 rural school districts of upstate New York. The net impact of consolidation on housing prices was an increase of approximately 24.5 percent per home for a 500-student school district and a 5.5 percent increase for 1,500-student school districts. These findings were based upon census tracts gathered by the state of New York in 1990 and 2000 as well as data from the New York Department of Education. The metrics used were regional housing characteristics, demographics, and economic characteristics. A linear regression model was used to estimate average housing prices and the net impact of consolidation for rural communities in New York.

Decentralized school districts in small, rural areas have been shown to be more important to the communities they serve. Another study in the state of New York focused on the impact schools had in communities with populations ranging from 500 to 2,500 (Lyson, 2002). The areas examined

decentralized schools that had a higher percentage of residents with higher-paying jobs. Not only did the residents of these communities have higher average family incomes, they also were employed in public sector jobs, occupations that served the public good. These findings suggested decentralized schools contributed to a greater sense of unity and social commitment in rural communities.

Students

Students are very much impacted by the process of school regionalization. Almost every change that takes place affects students in some way. Standardized test results such as Scholastic Aptitude Test (SAT), and in the state of Massachusetts, the Massachusetts Comprehensive Assessment System **(**MCAS) scores, are among several metrics that can be used to determine whether regionalized school districts are more effective in educating their students than non-regionalized school districts. Other metrics include graduation rate, matriculation rate, and the student to computer ratio.

Both the SAT and MCAS tests are important factors in students' completion of their high school education and admission to a college or university of higher learning. The MCAS test has been formatted to coincide with the requirements of the Massachusetts Education Reform Law of 1993 which states that the test must:

- "test all public school students in Massachusetts, including students with disabilities and limited English proficient students;
- measure performance based on the Massachusetts Curriculum Framework learning standards;
- report on the performance of individual students, schools, and districts" (MDESE, 2009a, p. 1).

Students are required to pass the MCAS testing in grade 10, in addition to the standards set forth by their local school district in order to receive a diploma (MDESE 2009a).

According to CollegeBoard (2010), the SAT is an integral part of college admission, and a good indicator of how well secondary education institutions have prepared students who wish to further their education past high school. This exam allows admissions officials to rate a student's performance using the test as a basis for comparison against other applicants. After a student's performance is rated and compared against other students' results, a decision can be made as to whether or not to accept the prospective student.

The average person's salary is strongly correlated to that person's level of education. The 2005 US Census Bureau report showed a difference of over nine thousand dollars of average earnings in one year favoring those with a high school diploma over those who did not graduate high school (Bergman, 2005). As average salaries greatly increase for those with a college degree, a competitive higher education and job market is created, favoring those with a higher quality of secondary education.

Because of this competitive market, the impacts of school size on student performance and experience, and its social consequences must be considered. Furthermore, the size of a school is one determining factor in cost-effectiveness, so the financial aspects (such as per-pupil cost and teacher salaries) of school size must also be considered. Shown on the next page is the distribution of school sizes in Worcester County (See Figure 3).
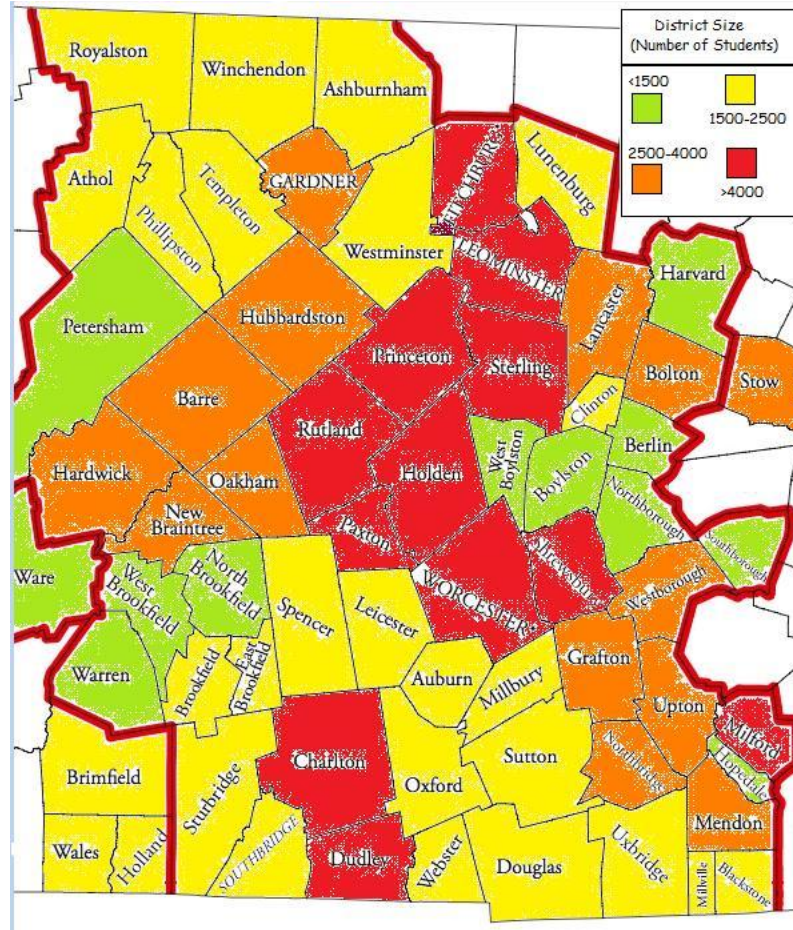
Figure 3: Worcester County District Size Map

According to Gardner, Ritblatt & Beatty (2000), larger school districts tend to show academic superiority over smaller districts. This conclusion was derived from the study of public schools in California, comparing large schools (defined as schools consisting of greater than two thousand students) with small schools (200 - 600 students). A greater percentage of students in large schools were taking the SATs. Furthermore, larger schools were found to have on average higher math and verbal scores than smaller schools, as well as a greater total score.

Nevertheless, the majority of studies on the effects of school size support the idea that students perform better in a smaller environment (Hicks, Drive, & Rusalkina, 2007). Many students, especially those who have not yet discovered how to learn on their own, require greater individual attention in order to understand concepts. A 2008 study conducted by the MASS Small and Rural School District Task Force reinforces this idea, stating that, "…indicators of student success such as graduation rate, dropout rate, post graduation plans and attendance..." were more favorable in smaller schools and districts than in their larger alternatives (Driscoll, L. E., Gougeon, F., Stevens, P., Millitello, M., Dardenne, P., Doiron, D., & Azar, P.J., 2008). According to Oxley, Barton & Klump (2006), there are millions of dollars in both federal and private grants being used to decrease school sizes in order to better support individual learning. This funding is part of the high school reform movement, which aims to replace larger schools with more 'personalized' institutions. In addition, Driscoll, et. al (2008) argue that if "[per-graduate cost versus per-pupil rate] were the determinant of fiscal economy", small school districts would be more fiscally efficient than their larger alternatives in the long run. Furthermore, small schools showed a lower absentee rate, lower dropout rate, and greater parental involvement (Gardener, Riblatt, & Beatty, 2000).

Taxpayers

School districts in Massachusetts are very much dependent on the cities and towns that they serve, unlike those in many other states, which are often separate government entities with independent taxing authority (Carleton, Lynch, and O' Donnell, 2009). The decision to regionalize school districts is one that affects everyone in their respective regions, including those who do not have children in the school system. If a new school is to be created, there are many financial expenses for taxpayers to consider (Hatch & Cabral, 2010). In order to properly understand what school re-organization option would be more favorable to different regions of Massachusetts, the

method in which taxpayer dollars are spent on education must first be understood. While the government decides how to handle these expenses, the money funding the decision ultimately comes from the taxpayers, which is calculated based on a number of socioeconomic standards. In Massachusetts, public educational funding is calculated every fiscal year by the Chapter 70 state budget formula (Hatch & Cabral, 2010). This budget formula was created in the early 1990's to provide a level of standardization that the state could use to distribute adequate and accurate funding for Massachusetts' public schools. The state formula requires that each school district maintain a "foundation budget" that is jointly funded by the state aid and local property taxes. According to Hatch and Cabral, the Massachusetts Department of Education calculates the funding formula based on three major areas: foundation enrollment, cost associated with student enrollment, and the "wage adjustment factor." The foundation enrollment, how many students attend a specific school district, is one of the most fluctuating statistics used for the formula because it changes every fiscal year. The formula separates students into ten different age groups and then assigns a certain monetary value based on their grouping. The number varies based on the individual costs associated in the classroom with each age group. The Chapter 70 formula calculates the costs associated with foundation enrollment based on eleven categories: administration, instructional leadership, classroom and specialist teachers, other teaching services, professional development, instructional equipment and technology, guidance and psychological, pupil services, operations and maintenance, employee benefits, and special education tuition. In their report, Hatch and Cabral also reveal that the two largest costs associated with student enrollment tend to be teacher salaries and building maintenance. These two costs alone comprise 56.1 percent of the entire Massachusetts Fiscal Year 2010 foundation budget. The "wage adjustment factor" adjusts per pupil spending totals based on the average salaries of the taxpayers in their respective school districts throughout the state. This

part of the Chapter 70 formula compensates schools where there is a higher cost of living expense associated with their employment.

One of the more significant issues concerning the Chapter 70 law has been the antiquated approach to calculating the eleven budget categories associated with foundation enrollment budget. The Massachusetts Department of Secondary and Elementary Education did restructure their foundation budget categories for Fiscal Year 2007 (Massachusetts Department of Secondary and Elementary Education, 2010a). In the first major changes to the foundation since its inception, state education officials consolidated the original eighteen functional categories to the current eleven groupings. The new consolidated fiscal groupings included streamlining the budget assumptions of major spending categories like teaching, maintenance, and special education tuition (Reconstituting the Foundation Budget, 2010). However, even though officials combined many major spending categories, according to cited research, the original definitions of adequate spending levels first developed in Fiscal Year 1994 remaining in statute. The budget categories were only adjusted annually by state and local government inflation rate.

Many education experts agree that the Chapter 70 budget assumptions are antiquated and not representative of the true cost of a public education in Massachusetts. In an interview with Roger Hatch, a top school finance administrator for the Massachusetts Department of Secondary and Elementary Education, acknowledged that the budget assumptions had not been updated other than annual adjustments for inflation. He also agreed that the antiquated Chapter 70 budget assumptions were was a legitimate concern. One of the main obstacles, he added, to solving this problem was conflicting political interests.

The Massachusetts State legislature has been forced recently to cut Chapter 70 state aid to public schools by as much as 4 percent for the Fiscal Year 2010 (Massachusetts Budget and Policy

Center, 2010). Changes have been made as part of an overall policy to balance the $5 billion deficit faced by the state for fiscal year 2009-2010. Another major problem in determining Chapter 70 funding has been the lack of funds available to take care of inflation in the annual state budget. Each year, legislators have appropriated less than the 6.75 percent needed for annual inflation costs. In the past, this level has been as low as 3.04 percent, which can be attributed to short-term money savings in under-funded municipalities. These issues have forced Massachusetts' taxpayers to pay a greater local premium for their public educational services.

Many of the recent cuts to the state's Chapter 70 funding for public schools have largely been due to revenue shortfalls caused by the current U.S. economic recession (Wallin and Snow, 2010). Signs of trouble began surfacing during Fiscal Year 2008, when the Massachusetts State Legislature was forced to use $216 million from the state's stabilization fund, a mechanism used by legislators to set aside money for unforeseen needs and emergencies. The warning signs of an oncoming recession were confirmed in October of 2008, when Governor Deval Patrick announced a $1.4 billion initial drop in state revenue. According to Wallin and Snow, the shortfall ultimately amounted to a $2.4 billion drop in receipts from Fiscal Year 2008 to Fiscal Year 2009 and was compounded by the steep cost increases of state healthcare and social services. They also state that the main reason for the loss of state revenue has been the increasing Massachusetts unemployment rate. According to the Bureau of Labor Statistics, the unemployment rate increased in Massachusetts by 3.1 percent in 2008 to 8.4 percent in 2009 (Bureau of Labor Statistics, 2010). Wallin and Snow (2010) argue that because unemployment rates continued to grow in early 2010 above the 9th percentile, there will be "very little natural revenue growth" for Fiscal Year 2011 and 2012, indicating a stagnant or negative growth rate for state Chapter 70 education funding. Due to significant state revenue shortfalls in a number of key areas, the authors indicated that diminished

education funding will continue to be a reality in the near future, until the economy rebounds.

With the fall in state revenue and subsequent cuts in programs such as Chapter 70 educational funding, Massachusetts's legislators have begun pushing a policy promoting governmental efficiency, specifically targeting the regionalization of state services (Regionalization Advisory Commission, 2010). Under the direction of Lieutenant Governor Timothy Murray, the state Regionalization Advisory Commission has recommended school regionalization as a way to implement significant cost savings for Massachusetts' taxpayers. While regionalization historically has resulted in cost savings in areas such as faculty and administration, the addition of new students and the ensuing expansion of school districts have resulted in increased secondary educational costs. (Hanley, 2005). A 2005 University of Iowa study by Professor Paul Hanley looked at the secondary cost of added transportation costs by generating proposed school district consolidation within the state of Iowa using a Monte Carlo computer model simulation. Using a statewide school district target enrollment of 1000 students, Hanley generated new consolidated school districts based on existing school district data, but with the following goals in mind: minimizing total miles traveled by the bus, meeting all student busing demands, and the prevention of unacceptably long trips for students. With these principles in mind, the Monte Carlo simulation created more compact school districts from adjacent districts and created the most efficient transportation route for students in different parts of the new areas. The study concluded that even after implementing the most efficient busing routes possible, the school district regionalization mileage increased a total of 5.1 percent and the total transportation operating costs increased 8.8 percent. The study concluded that transportation costs were a significant added cost when for school districts to consider when regionalizing.

Taxpayers must keep in mind the added secondary costs, such as added special education and healthcare costs, that regionalization could incur. One of the largest costs that added school district enrollment could invite is added healthcare costs (Britt, M. & Hall, A., 2009). According to a 2009 Harvard Kennedy School of Government report, Massachusetts has the second highest per-pupil spending on healthcare in the country. Healthcare costs, unlike other spending criteria in the Chapter 70 foundation budget, have been increasing recently by double-digit percentages annually. These costs are driven mainly by the labor costs associated with compensating teachers, administrators, and other school personnel. Another major costs driver in the foundation budget has been special education costs. Average per-pupil spending costs for special education students can be 20-30% higher than the foundation budget appropriates money for and much larger for total budget costs. For example, in Fiscal Year 2007, actual per-pupil spending for special education students in Massachusetts was 32% higher than the foundation budget assumed and 79% higher when the total budget was examined.

Summary

The background analysis we conducted gave us a clear picture about the main issues that communities across the state of Massachusetts face when dealing with the issue of school district regionalization. We first researched the initial movement behind school consolidation and looked at the history that eventually lead to the implementation of the Massachusetts Education Reform Act in the 1990's, legislation that lead to the modern movement for school regionalization. Building on the history of school district consolidation, we examined modern arguments for and against school consolidation in five key areas: administrators, teachers, parents, students, and taxpayers. These areas in our background addressed the important arguments about school consolidation from five different angles, an approach that was critical to understanding all the information necessary for a

community to make an educated decision on the issue.

Our next step, after studying all of material we had discovered, was creating a methodology where we could practically apply our research into meaningful results. Our goal was to provide an objective cost-benefit analysis about school district regionalization that would study the real world problems of a specifically defined sample size. Using all of our newly found information, we started the process of formulating a study that would provide relevant facts for our sponsor.

Chapter 3: Methodology

The goal of this project was to determine the advantages and disadvantages of regionalization as a viable solution to the education budget crisis in the state of Massachusetts. In order to make any recommendations, our team gathered information to determine both the successes and the failures of regionalized and non-regionalized schools. To achieve the goal of our project, we developed the following methodology to obtain information; including interviews with key administrative personnel and faculty members, as well as the examination of scholarly literature on school regionalization. The following sections detail these methods, and why we have chosen to use them.

Defining a Regionalized and Non- Regionalized School System

Before we were able to select the schools from which we would gather information, we first had to decide on our definition of what was a regionalized and non-regionalized school system. In order to determine this information, our team consulted the Massachusetts Department of Elementary and Secondary Education [MDESE] website (http://www.doe.mass.edu/). From this website we were able to determine that the state's definition of a regionalized school as a "school district [that] provides educational services to more than one town" (MDESE 2009f, p.1). The definition of a non-regionalized school is a "district that is administered by a city or town school committee" (MDESE 2009f, p.1).

Selection of Schools

Before our team was able to select schools at which we were going to conduct interviews, it was necessary for us to obtain the total number of regionalized and non-regionalized schools in the state. After referencing the MDESE website in addition to information given to us by our sponsor, Representative Gobi, we were able to determine that there are 329 regionalized and non-regionalized school districts in the state of Massachusetts (MDESE 2009e, p.1). In order to ascertain how many school districts were regionalized and how many were non-regionalized, our team sorted through the FY 2011 Governor's Budget Recommendation (see Appendix I), which had the results of every school in the state, placing schools into the two categories. On a map of Massachusetts, the regionalized school districts were colored red, while the non-regionalized school districts were colored blue, as shown below (See Figure 4).
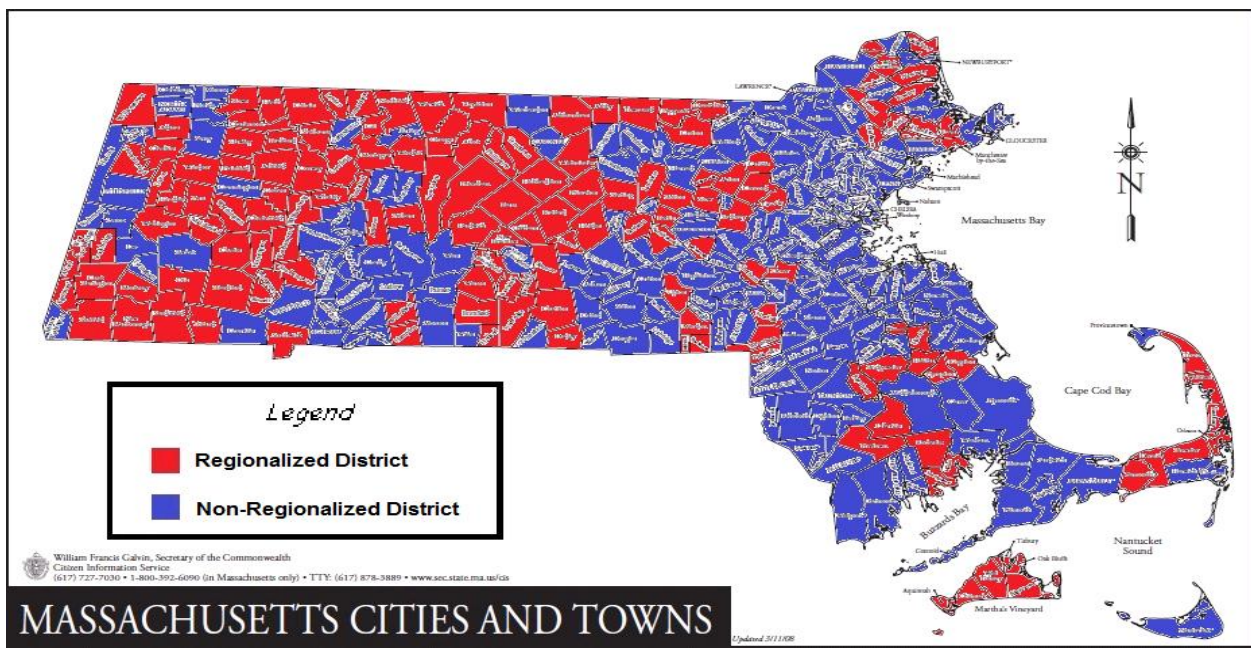
Figure 4: Massachusetts Map of Regionalized and Non-Regionalized School Districts
Note: Map adapted from City and Town Map (1998). Retrieved September 14, 2010 from http://www.sec. state.ma.us/cis/cispdf/ma_city_town.pdf

Once we had received the list of schools from Representative Anne Gobi, the next step was to decide which of the schools we would be studying. Due to time constraints, it would have been unrealistic to examine every regionalized and non-regionalized school in Massachusetts. Nevertheless, we wanted to make sure that the schools we did decide to study were representative of the entire population of schools and of our sponsor's legislative district. We structured the data from our study to be relevant to the district of our sponsor, State Representative Anne Gobi's 5th Worcester District (see Figure 6 below). The district included Ware, Barre, Brookfield, Hardwick, New Braintree, North Brookfield, Petersham, Phillipston, West Brookfield, Spencer, and Templeton.
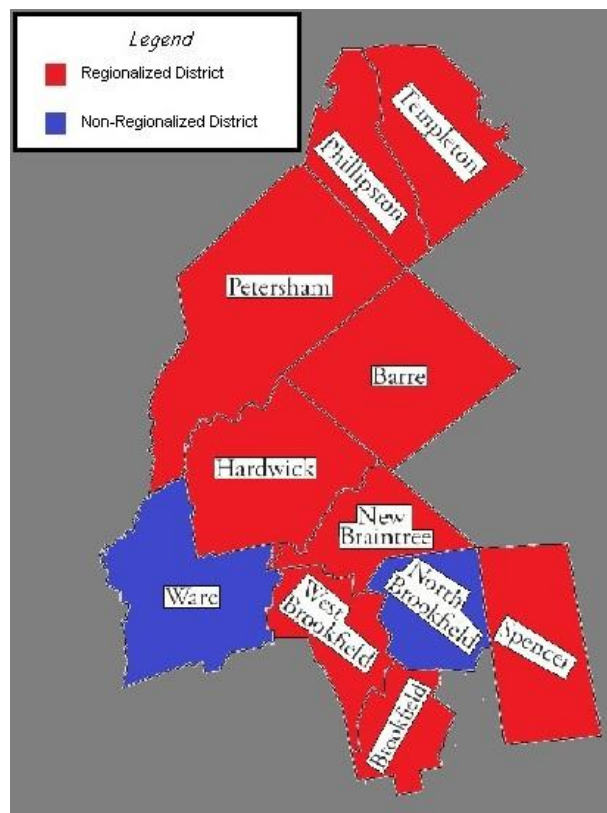
Figure 5: 5th Worcester Legislative District

Note: The towns that are colored red are members of regionalized school districts. The towns that are colored blue are municipal school districts. Map adapted from City and Town Map (1998). Retrieved September 14, 2010 from http://www.sec.state.ma.us/cis/cispdf/ma_city_town.pdf

We first examined Worcester County to see whether the area would give us sufficient relevant data for regionalized and non-regionalized schools to compare to the aforementioned district of our sponsor. After studying the school district data we had received, we observed that the county had one of the most diverse school district demographics in Massachusetts. It is comprised of 27 non-regionalized and 14 regionalized school districts. We studied the average population density of our sponsor's district and noticed that they were mainly located amongst a low population density part of the county that was mostly comprised of regionalized school districts. When we investigated the population density demographics (obtained from the Massachusetts Municipal Association; See Appendix K), we found that the average population density for Representative Gobi's legislative district to be 217 people per square mile, which was significantly smaller than the average for Worcester country, 496 people per square mile (U.S. Census, 2000). In order to better understand the educational impacts that school district choice had on Representative Gobi's constituents, we decided that we should research relevant data on the topic and use Worcester Country as our sample area. We decided to choose the data from the aforementioned area because it presented data that was most relevant and useful to producing meaningful results at the end of our analysis.

However, we felt that we needed further proof to prove that Worcester County contained the best sample size to test the hypotheses formulated from our background analysis. One important statistic that we noticed was distinctly unique for the area was population density data, measured in people per square mile. We studied 2000 U.S. Census Data and found that the average population density for Worcester County itself was 496 people per square mile (U.S. Census, 2000). The population density in eastern Massachusetts tended to be much higher than the central part of the state. For our "eastern Massachusetts" definition, we examined data from the six eastern

Massachusetts counties surrounding and including the city of Boston: Middlesex, Essex, Suffolk, and Norfolk counties. The population density data, measured in persons per square mile, amounted to 1,780, 1,445, 11,788, and 1,628 people per square mile, respectively. The data showed that the mean population density value the four counties totaled 4,160 people per square mile, a much larger number from that of Worcester County. When we investigated western Massachusetts population density, we focused on three out of the four counties west of Worcester County, excluding the greater Springfield metropolitan area located in Hampden County: Hampshire, Franklin, and Berkshire counties. The population density data for these three counties was: 288, 102, and 145 people per square mile, respectively. Hampden County was not included because we determined it not to be entirely representative of western Massachusetts due to the presence of Springfield, one of the largest cities in New England. The mean population density value for the three counties amounted to 178 people per square mile, a drastically different value from the 496 people per square mile of Worcester County. When we took all this data into account, as well as the time constraints given to us, it seemed clear that Worcester County would be our best chance to obtain relevant data for our study.

Conducting Interviews

We chose to conduct interviews in districts that were similar those in State Representative Anne Gobi's 5th Worcester District. We decided to use population density as the determining factor for similarity between school districts. The average of the population density for the 5th Worcester districts was 217 people per square mile. The range of population densities in the 5th Worcester district was from 24 people per square mile to 599 people per square mile, a difference of 575. We then divided this number by 11 — the number of towns in the 5th Worcester district — and found a result of about 55. This number is the average difference in population density between towns in the

5th Worcester district. Thus, we used this number in order to determine the range by adding 55 to 217 for the upper value and subtracting this number from 217 for the lower value, resulting in a range of 162 people per square mile to 272 people per square mile. A list of school districts was created containing every town that fell into this range. School officials from each of these districts were contacted, and interviews were conducted based on the responses.

Obtaining School Performance Data

Our examination of school performance data was modeled after a recent Appalachian State University comparison of regional and non-regional schools in the state of Connecticut (See Appendix H; Cullen, 2010). This data was analyzed in order to potentially identify key similarities and differences between the performance data and the scientific sampling that was done. In the aforementioned research study, public schools were evaluated based upon a comparative design of key demographic and geographic characteristics. The data elements that were provided to us by the Massachusetts Department of Elementary and Secondary Education were separated into specific groupings based on the type of data that they provided. To measure socioeconomic status, two data elements were used: median family income and the percent of minorities in the school district. To assess financial need, three other gauges were used: the percentage of children living in families with a single parent, the percentage of children enrolled in public schools whose families have incomes that make them eligible to receive free or reduced-price meals, and the proportion of children in the district whose families speak a language other than English at home. In order to further understand specific school districts well-being, per-pupil spending and students per computer data were also considered in our study.

Part of our school performance data analysis involved the examination of state standardized test scores, specifically the Massachusetts Comprehensive Assessment System (MCAS) and the

Scholastic Aptitude Test (SAT). These standardized test instruments were used to address the issue of variability in academic performance of school districts located in different parts of Massachusetts. Since the tests were taken under the same relative testing conditions, the data should serve as a relevant indicator to school performance throughout the state. MCAS and SAT scores were obtained through the Massachusetts Department of Elementary and Secondary Education website (http://www.doe.mass.edu/). We compared the SAT and MCAS scores from all school districts in Worcester County in order to find trends among the data (see Appendix D and C).

Another part of our examination of these school districts involved an analysis of teacher quality data provided by the Massachusetts Department of Elementary and Secondary Education (See Appendix B). The metrics provided by this index included: total number of teachers in a given school district, percent of teachers licensed to teach the subjects to which they have been assigned, the total number of classes a given school offers in core academic areas, percentage of classes that are being taught by highly-qualified teachers, and student-teacher ratio. In addition to teacher quality data, we also analyzed and compared teacher salaries (obtained from the Massachusetts Department of Elementary and Secondary Education; see Appendix G) for school districts in the state of Massachusetts (See Appendix I).

Replicating Studies

Part of our investigation involved replicating two major studies. One was a model created by Appalachian State University which compared socioeconomic demographics in both regionalized and non-regionalized school districts in the state of Connecticut. The second study that was replicated was a housing research model used by the University of Wisconsin and Syracuse University which attempted to determine whether there is a correlation between regionalized school districts and the housing values in those districts.

The Appalachian State University model involved the analysis of different socioeconomic metrics in the state of Connecticut. Their information was obtained from Connecticut Education Data and Research (2008). These metrics were then separated into two categories; regionalized and non-regionalized. After being separated, these indicators were compared in order to find trends in the data. These trends were found by calculating means and standard deviations for all of the indicators.

Our replication of this study required that we use two alternate sources to obtain our information. We required the necessary metrics from the Massachusetts Municipal Association and the Massachusetts Department of Elementary and Secondary Education websites. After obtaining the data needed to replicate the Appalachian State model, we separated the information into several tables based on whether the data came from a regionalized or non-regionalized school district. Our next step used Microsoft Excel and the formulas that it offers to calculate averages and standard deviation for each category.

In order to properly put into perspective the New York model on the impact of school consolidation on housing prices for Massachusetts, the aforementioned research model was adapted for our sample frame. Unlike the New York study, our sample frame consisted of 41 total school districts constricted to Worcester County in central Massachusetts. This number included regionalized and non-regionalized school districts of varying population density. The New York study consisted of 228 rural school districts throughout upstate New York, and obtained housing data from consolidated school district area from U.S. Census data gathered in 1990 and 2000. They then went on to compare the change in average home values and rents over that two-year period.

In replicating this study, median housing values and average listing prices for each town in Worcester County were found at Trulia.com. The number of total housing units and housing density

for each town in Worcester County was found on the 2000 U.S. Census Bureau report (The year 2000 data was used because it was the most recent report containing this information). The remainder of the data required to duplicate the study was obtained from the Massachusetts Department of Elementary and Secondary Education website. The data was then separated by regionalized town districts and non-regionalized town districts, from which averages and standard deviations were calculated and analyzed.

After replicating these two models, we used Microsoft Excel to create tables and graphs in order to test our hypotheses.

Creating Hypotheses

After we had obtained the necessary data from the Massachusetts Department of Elementary and Secondary Education website, we developed several hypotheses based on the arguments framed in the literature review. Reviewing all of the arguments resulted in five hypotheses that we then tested for correlations to either prove or disprove the arguments. The hypotheses are as follows:

1. Regionalized school districts have higher total SAT test scores than non-regionalized districts

2. A school district representing a larger student population will result in lower per- pupil spending

3. Non- regionalized school districts have smaller student-teacher ratios

4. School districts representing a larger student body have higher SAT scores

5. A school district representing a smaller student population will result in a higher graduation rate

Using data from the Massachusetts Department of Elementary and Secondary Education website, Trulia.com (a real estate search engine), and the U.S. Census (2000), a 6th hypothesis based on the literature review was able to be tested:

6. Housing values in districts containing regionalized schools will be greater than housing values in non-regionalized districts

Testing Hypotheses

In order to test the first of the hypotheses, the SAT math, verbal, and reading scores of each of the school districts in Worcester County were obtained through the Massachusetts Department of Elementary and Secondary Education website. These three scores were combined to give the total SAT score for each of the school districts. The average total SAT score for regionalized school districts was then calculated by taking the average of the total scores of the regionalized schools. Similarly, the average total SAT score for non-regionalized school districts was also calculated. The two values of average total SAT score were then compared and displayed as a bar graph.

In order to test the second hypothesis, the number of students in and the per pupil spending data of each of the school districts in Worcester County were obtained through the Massachusetts Department of Elementary and Secondary Education website. Each school district was then assigned an x-coordinate corresponding to number of students in that district, and a y-coordinate corresponding to the number of per pupil spending dollars of that district. The points were then plotted on a scatter plot and analyzed.

In order to test the third of the hypotheses, the number of students and the number of teachers in each of the school districts in Worcester County were obtained through the Massachusetts Department of Elementary and Secondary Education website. The student to teacher ratio was then calculated for each of the districts by dividing the number of students by the number

of teachers. The average student to teacher ratio for regionalized school districts was then calculated by taking the average of the student to teacher ratios of the regionalized schools. Similarly, the average student to teacher ratio for non-regionalized school districts was calculated. The two values of average student to teacher ratio were then compared and displayed as a bar graph.

In order to test the fourth hypothesis, the number of students in, and the SAT math, verbal and reading scores of each of the school districts in Worcester County were obtained through the Massachusetts Department of Elementary and Secondary Education website. The three SAT scores were combined to give the total SAT score for each of the school districts. Each school district was then assigned an x-coordinate corresponding to number of students in that district and a y-coordinate corresponding to the total SAT score of that district. The points were then plotted on a scatter plot and analyzed.

In order to test the fifth hypothesis, the number of students in, and the graduation rates of each of the school districts in Worcester County were obtained through the Massachusetts Department of Elementary and Secondary Education website. Each school district was then assigned an x-coordinate corresponding to number of students in that district, and a y-coordinate corresponding to the graduation rate of that district. The points were then plotted on a scatter plot and analyzed.

In order to test the final hypothesis, the study conducted in New York comparing housing prices of consolidated regions and non-consolidated regions described in our literature review was reproduced using Worcester County Data (as explained in the Replicating Studies section of our Methodology).

Chapter 4: Findings

This section addresses legislation that is currently under review by the state of Massachusetts which regards regionalization and issues faced by many municipal districts, as well as the hypotheses that were introduced in the methodology section using the data that has been obtained from the Massachusetts Department of Elementary and Secondary Education website.

Current Massachusetts Legislation

Paragraph four; section 42B of chapter 71 addresses the 'increasing teacher pay scale' issue mentioned in the literature review. According to both Superintendent Brian McDermott of the Tahanto Regional School District and Dr Steve Hemman, Executive Director of the Massachusetts Association of Regional Schools, this section is often misinterpreted. It does not state that the newly formed regional school district will have to adopt the highest pay scale of all districts involved in the process. This section only requires that teachers not be paid less than they were receiving before the school districts merged (B. McDermott, personal communication, September 23, 2010; S. Hemman, personal communication, September 24, 2010).

Review of Changes to Massachusetts Legislation

House bill No. 4754 ─ regarding school regionalization ─ is currently in front of the House Committee of Bills in Third Reading. This is a necessary step in the legislative process to ensure that the bill is written correctly and does not conflict with any laws or statutes. This bill seeks to accomplish two main goals. The first goal is to rewrite the text in paragraph four; section 42B of chapter 71, so that it may be interpreted more clearly. This bill would change the section on teacher salaries to read;

> "All such personnel employed by the new regional school district committee shall be compensated not less than the compensation received by

such school personnel immediately prior to his employment by the new regional school district committee. Such compensation will remain in effect until the regional school district committee and the appropriate exclusive bargaining representative for regional school district employees reach a successor to the bargaining agreement or agreements previously negotiated by the preceding school or regional school district committees." (House Bill No. 4754; Section 1, paragraph 1).

The second part of the first section of this proposed bill is already a part of the Massachusetts General Laws. It entails the establishment of a commission that will, "examine the efficient and effective strategies to implement school district collaboration and regionalization" (House Bill No. 4754; Section 2, paragraph 1). This commission will examine regionalization model approaches based on the following criteria;

"(1) identifying indicators for assessing the academic and programmatic quality, overall district capacity, including the effectiveness of the central office, and the fiscal viability, efficiency, and long-term sustainability of school districts; (2) cooperative purchasing of materials and services; (3) inter-district academic and extracurricular programs; (4) merger of school district central office buildings, staff, and operational systems; (5) merger of collective bargaining agreements; (6) merger of debt obligations, including for school building projects; (7) the effect of school district regionalization on educational and instructional outcomes; (8) the effect of school district regionalization on school funding allocations; (9) school consolidation; (10) transitional costs associated with school district regionalization; (11) appropriate time frames for implementing school district regionalization; (12) incentives for school districts to increase collaboration and/or regionalize; (13) revisions of chapter 71 of the General Laws to facilitate the effective implementation of existing and future regional school district agreements; (14) school building capacity and facilities; (15) the feasibility of adopting a regional district finance structure in which the local contribution of the member cities or towns that such regional district serves is assessed on the basis of a uniformly measured fiscal capacity; and (16) in-district collaborations between schools, including consolidating buildings, programs, school and central office administration, special education and food service" (House Bill No. 4754; Section 2, paragraph 2).

The set of criteria above describes the various aspects that school districts need to address when exploring the idea of regionalization. Given that no two school districts are the same, there

may be changes to the criteria listed above. The commission will then generate a report based on their findings.

The third section ─ and second goal ─ of this bill is for the commissioner of elementary and secondary education to review every school district in the state with fewer than one thousand students enrolled in an attempt to examine the following areas;

"(1) the academic and programmatic quality of the school district; (2) the capacity of the district, including the effectiveness of the central office of the school district, to support high levels of student achievement; (3) the fiscal viability and efficiency of the school district; and (4) the overall sustainability of the school district in future years" (House Bill No. 4754; Section 3, paragraph 1).

The purpose of this examination is for the commissioner to determine whether any of the areas listed above need improvement and/or could be more adequately achieved through collaboration of services or regionalization of that specific district.

In the review of the given school district, the commissioner will evaluate several different types of indicators (not limited to, but including), student performance, teacher qualification statistics, student discipline statistics, rigor and variety of academic curriculum, extracurricular offerings, school accountability, administration quality, school enrollment, town population data, socioeconomic statistics, district budget information, as well as any relevant information that the school district would like to provide.

Section four of this bill states that after conducting this review, the commissioner will release a public report of his/ her findings, and the regionalization model approaches suggested by the commission. In this report the commissioner will make recommendations for the district. Some possible recommendations include;

"(1) collaborate with one or more districts, an educational collaborative, a city, town, or other entity to address one or more areas of need identified in the review, (2) form a regional school district to address one or more areas of need identified in the review, or (3) continue to operate with no changes in its level of collaboration or governance structure" (House Bill No. 4754; Section 4, paragraph 1).

In the case of a recommendation to regionalize, the report will indicate the districts that are included in the plan, a plan to combine the district, personnel, students, etc., a student transportation plan and a transportation budget for the district, expenditure plan and budget for the new district, the geographical information with regards to the new district, and an outline of the academic and programmatic offerings.

This proposal would then be reviewed by all districts involved in the regionalization plan, and a vote would be taken to decide the outcome.

The final section of the bill requires that within sixty days of the approval of the plan to regionalized, a detailed plan for implementation will be submitted to the commissioner.

This bill was extremely important to our study. Although we were able to form various hypotheses to test in order to determine whether regionalization or non-regionalization was a better option, we were only able to compare in generalities. Since no two school districts are the same, it would be beneficial to support this bill as it would allow for a more comprehensive and individualized study to be done to determine what path would be better for municipal school districts in Massachusetts.

Hypothesis 1:

The first hypothesis based on the literature review stated that regionalized school districts will have a higher total SAT test scores ─ consisting of the sum of the math, verbal, and reading scores ─ than non-regionalized school districts. Shown below is a bar graph comparing the average total SAT score of regional school districts to the average total SAT score of non-regional school districts in Worcester County (See Figure 6).
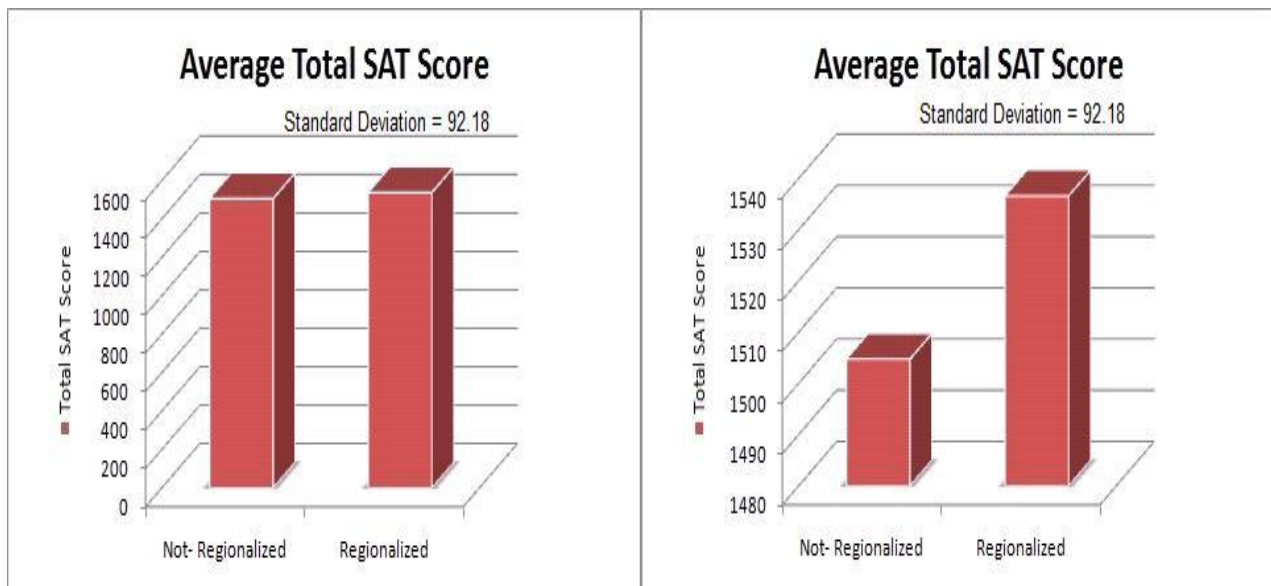
Figure 6: Average Total SAT Score

As shown in the graph above, regionalized school districts in Worcester County have an average total SAT score of 1536.57 while non-regionalized school districts have an average total SAT score of 1504.69. As predicted in the hypothesis, regionalized school districts in Worcester County do have a higher average total SAT score than non-regionalized school districts in Worcester County. However, with a standard deviation of 92.18 points, a difference of about 31 points between the two types of school districts, which is about one third of the standard deviation, is statistically insignificant. We were therefore unable to find support for this hypothesis.

Hypothesis 2:

The second hypothesis stated that schools representing a larger student population will result in lower per-pupil spending. The scatter plot below shows the total number of students in each of the school districts in Worcester County compared to that district's per- pupil spending in an attempt to find a correlation (see Figure 1).
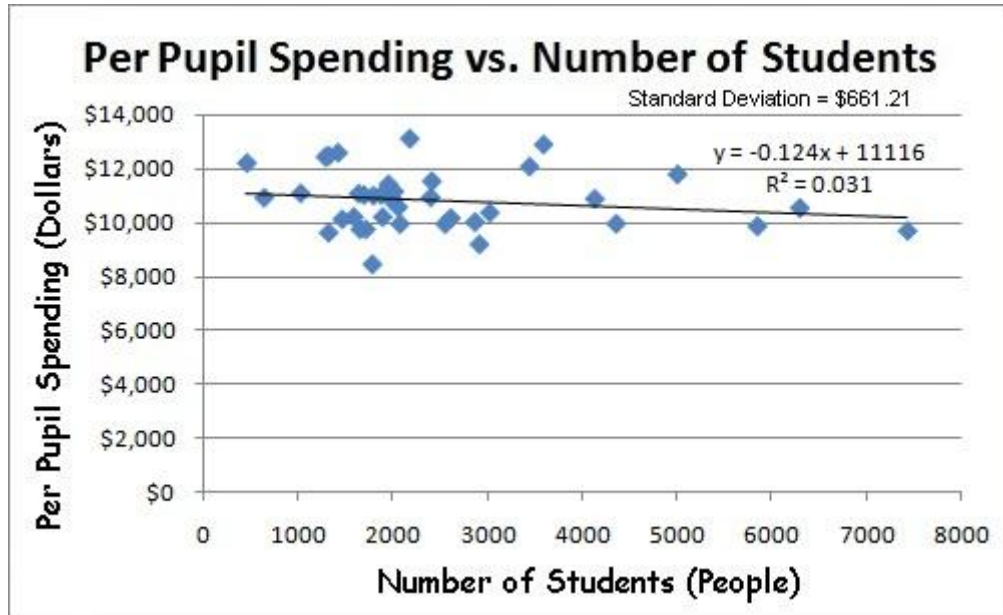
Figure 1: Per Pupil Spending vs. Number of Students

Note: The Standard Deviation of $661.21 shown above is the Standard Deviation of the residual difference between the actual per pupil spending and the expected per pupil spending, calculated based on the line of best fit.

The R-squared value of 0.031 indicates that 3.1 percent of the variation in per pupil spending dollars is explained by the variation in number of students. There is very little correlation between the total number of students in Worcester County school districts and per-pupil spending in those same districts, so we were unable to find support for this hypothesis.

Hypothesis 3:

The third hypothesis was that regionalization of school districts will result in larger student-teacher ratios than non-regionalized districts. Shown in the bar graph below is the average student-teacher ratio for regionalized school districts compared to the average student-teacher ratio of non-regionalized school districts in Worcester County (see Figure 7).
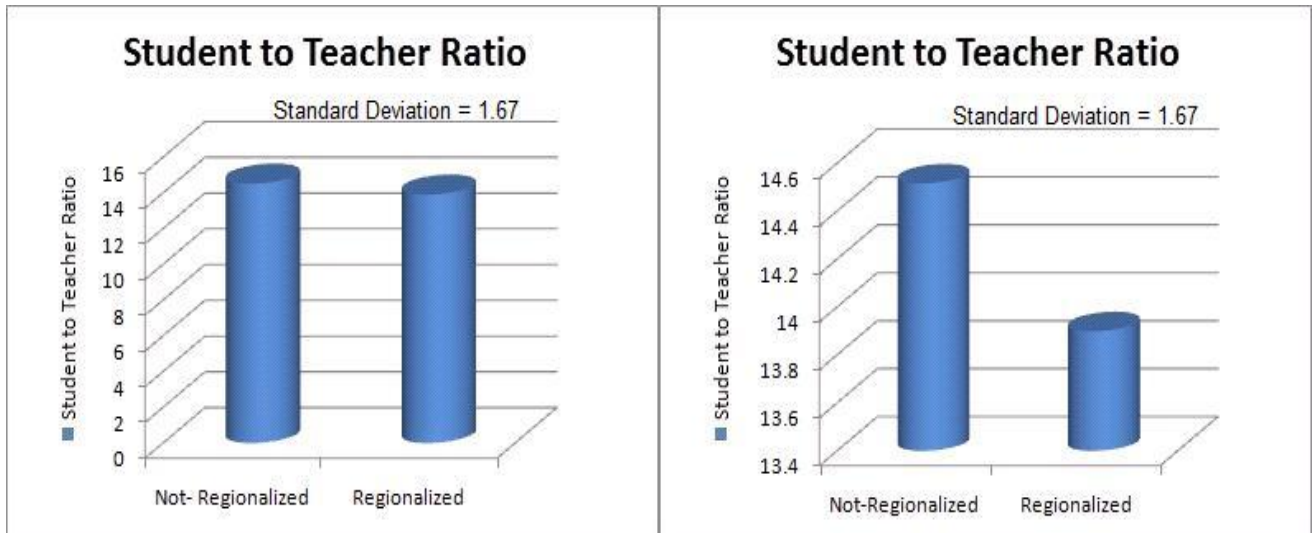
Figure 7: Student to Teacher Ratio

Note: The standard deviation in student-teacher ratio in Worcester County is 1.67, and the difference between student-teacher ratio in regionalized and non-regionalized schools is 0.62, a difference of about 0.4 standard deviations.

Non-regionalized school districts had an average student-teacher ratio of about 14.52, while regionalized school districts had an average student-teacher ratio of 13.9. As indicated above, non-regionalized school districts have (on average) a higher student-teacher ratio than regionalized school districts in Worcester County. This is contradictory to the assumption of regionalized school districts having a higher student to teacher ratio. Furthermore, the standard deviation in student-teacher ratio in Worcester County is 1.67, and the difference between student-teacher ratio in

regionalized and non-regionalized schools is 0.62, a difference of about 0.4 standard deviations. This difference is not great enough to be statistically significant. This hypothesis is not supported.

Hypothesis 4:

This hypothesis stated that in general, school districts with a larger population will also represent a higher total SAT score than school districts representing a smaller population. The scatter plot below shows the number of students in a given Worcester County school district and the corresponding total SAT scores (see Figure 2).
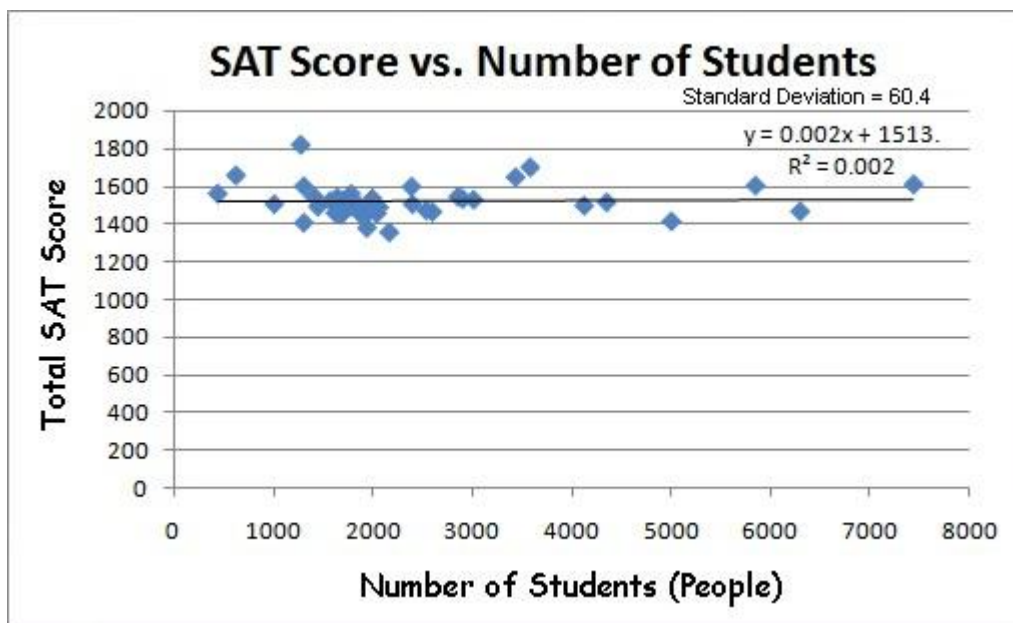
Figure 2: Total SAT Score vs. Number of Students

Note: The Standard Deviation of 60.4 shown above is the Standard Deviation of the residual difference between the actual average total SAT score and the expected average total SAT score, calculated based on the line of best fit.

The R-squared value of 0.002 indicates that 0.2 percent of the variation in average total SAT score is explained by the variation in number of students. There is no correlation between the total number of students in Worcester County school districts and total SAT score in those same districts, so the hypothesis is not supported.

Hypothesis 5:

Our fifth hypothesis stated that school districts in Worcester County which represented a smaller student population would also represent a higher graduation rate. The scatter plot below shows the comparison between the number of students in given Worcester County school districts and the corresponding graduation rate (see Figure 8).
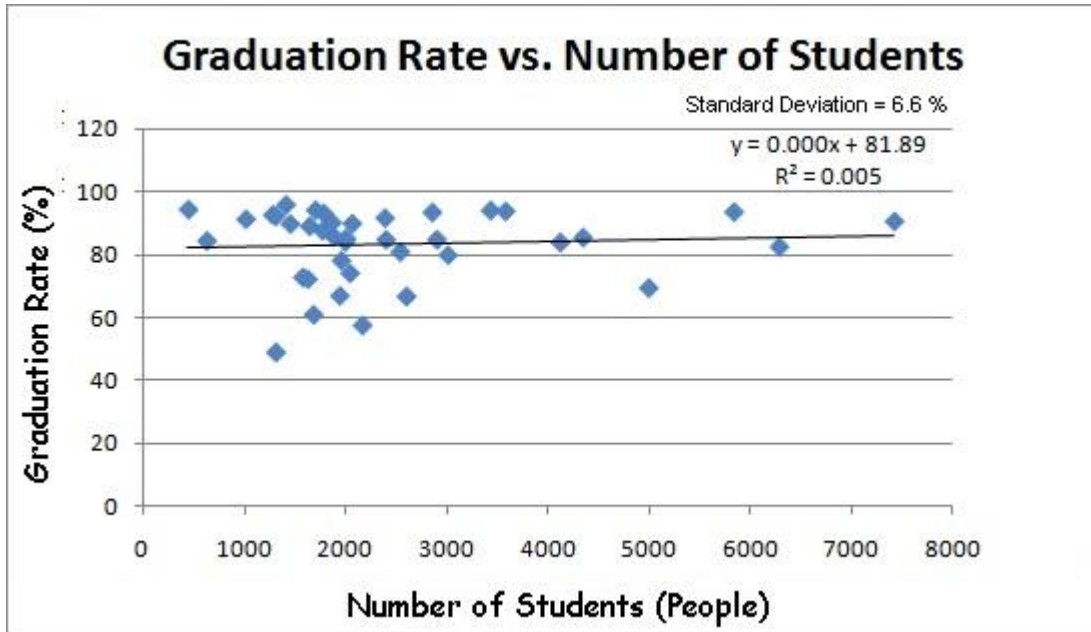
Figure 8: Graduation Rate vs. Number of Students

Note: The Standard Deviation of 6.6 % shown above is the Standard Deviation of the residual difference between the actual graduation rate and the expected graduation rate, calculated based on the line of best fit.

As the number of students a given school district in Worcester County represented increased, the graduation rate for a given district does not decrease. The change in graduation rate is very close to zero; the value of the slope being 0.000549. Furthermore, the R-squared value of 0.005 indicates that 0.5 % of the variability in graduation rate is explained by the variability in number of students. Thus, the hypothesis is not supported.

Hypothesis 6:

Our final hypothesis stated that housing values in districts containing regionalized schools will be greater than housing values in non-regionalized districts. The table below is a reproduction of the study conducted in New York found in our literature review, adapted to compare several similar regions in our sample frame. Using Worcester County statistics, it compares several factors in determining housing values between consolidated and non-consolidated districts (See Table 4).

Table 4: Descriptive Statistics for School Districts in Worcester County

Note: This table represents a replication of a similar study conducted on New York housing prices.

Variable	Consolidated District		Non-Consolidated District	
	Mean	**Standard Deviation**	**Mean**	**Standard Deviation**
Median Housing Values	$236,823	$98,882	$224,226	$92,938
Average Listing Prices	$318,904	$109,685	$300,074	$117,982
Total Housing Units	2249	1437	8838.84	13523.1
Housing Density (Houses/Square Mile)	98	70	404.43	391.44
Median Household Income	$65,857	$14,435	$63,266	$17,115
Population Density	261	192	997	936
Total Enrollment	3005	2082	3364.72	4527.7
Expenditure per pupil	$10,743	$1,011	$10,834	$1,173
Average State Aid per pupil	$13,306.19			
N	14		27	

The mean Median Housing Value for consolidated districts was $236,823, a value greater than the mean Median Housing Value for non-consolidated district of $224,226 by $12,597. The mean Average Listing Prices for consolidated districts was $318,904, a value greater than the mean Average Listing Prices for non-consolidated district of $300,074 by $18,830. Nevertheless, the standard deviations in Median Housing Values for both consolidated districts and non-consolidated districts are relatively high, both about eight times the difference between mean values. The standard deviations in Average Listing Prices for both consolidated districts and non-consolidated districts

are also high, both more that six times the difference in mean values. This means that the difference in housing values is not large enough to be statistically significant, making us unable to provide support for this hypothesis.

As you can see in the figure below, the distribution of housing prices in Worcester County is not geographically correlated to the distribution of regionalized and not regionalized school districts (See Figure 9).
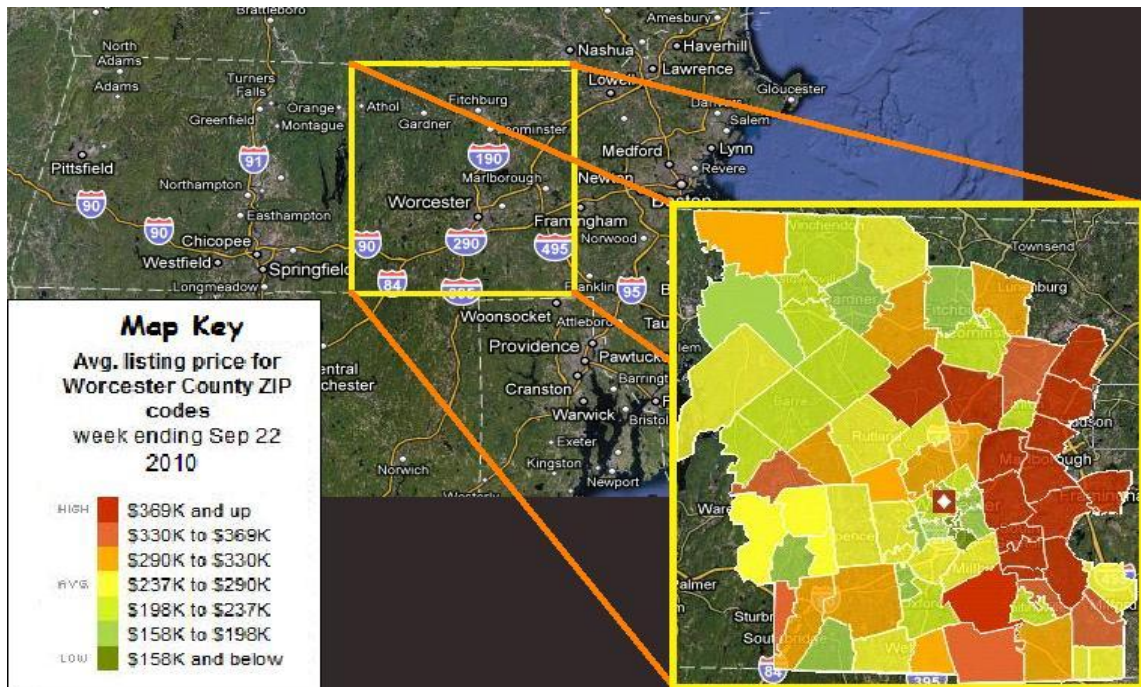
Figure 9: Average Listing Price for Worcester County Map

Note: Picture adapted from Worcester County Home Prices and Heat Map (2010). Trulia: Stats & Trends. Retrieved September 29, 2010 from http://www.trulia.com/home_prices/Massachusetts/ Worcester_County-heat_map/

Discussion

Based on the results of testing the first hypothesis, it is clear that regionalized school districts in Worcester County have a slight advantage preparing students for national standardized tests. Even though the standard deviation of the data deems the findings statistically insignificant, our data does indicate that regionalized school districts in Worcester County have higher SAT test scores.

The test of the second hypothesis revealed no real statistical significance between school district size and per-pupil spending. This could be due to the fact that when school districts increase in size, even though they increase efficiency in areas such as administration and school supply purchasing power, there are added costs due to increase in secondary services. This could also be due to human error in the testing, such as overlooking variables that influence per-pupil spending and inability to control for said variables.

The test of the third hypothesis not only disproved the fact that regionalized school districts historically have higher student-to-teacher ratios, but actually found that non-regionalized school districts have a slightly higher ratio. However, the difference between student to teacher ratios between regionalized districts and non-regionalized districts was not very great, and fell within the standard deviation. Therefore, there was no significant difference in student to teacher ratio found between regionalized and non-regionalized school districts, refuting the pro-non-regionalization argument found in our research.

The test of the fourth hypothesis revealed no real statistical significance between school district size and SAT score. The greatest indicator for MCAS score was percent low-income (J. Nystrom, personal communication, October 4, 2010). This could be the case for SAT Scores, as well. However, we did not control for low-income in our testing, which could be the reason that no correlation was found between district size and SAT score. This could also be due to human error in

the testing, such as overlooking similar variables that influence SAT Score and inability to control for said variables.

The results of the test of the fifth hypothesis showed no significant correlation between graduation rate and the number of students in regionalized and non-regionalized school districts. There is no definitive reason for why students do not graduate; there could be a number of variables involved such as influences outside of school, lack of interest in learning, etc. We were unable to control for outside variables.

The data found to test our final hypothesis, exploring the relationship between school district regionalization and median housing values for Worcester County, determined that regionalized school districts have higher housing prices. However, this difference was relatively small, compared to the standard deviation in housing prices, and was statistically insignificant. Since the higher median housing prices were located on the eastern border of Worcester County, we were able to attribute this variation in housing prices of school districts to their proximity to the Boston Metropolitan area.

Chapter 5: Conclusions and Recommendations

This chapter proposes recommendations about regionalization to our sponsor, State Representative Anne Gobi, as well as highlights areas of study for future projects on the topic of school regionalization. The following conclusions provide an objective cost-benefit analysis about the state of education in Worcester County, Massachusetts and serves as an example for future studies of similar context.

Conclusions

After analyzing the data we had gathered and calculated through the frameworks of our adapted Appalachian State University research model (see Appendix H), our findings led to several data-driven conclusions about school district regionalization. Drawing from scientific research cited throughout our background analysis of our topic, we proceeded to compare academic performance in a number of key areas. Our findings compared educational and socioeconomic data between regionalized and non-regionalized school districts. In addition, our background interviews with Massachusetts' education officials yielded insightful information about current proposed legislation concerning school district regionalization.

We were unable to provide support for any of the six hypotheses. The three hypotheses that directly compared regionalized school districts with non-regionalized schools districts showed that there is no significant difference in SAT scores, student to teacher ratios, and housing prices between regionalized and non-regionalized school districts. For the remaining three hypotheses that compared number of students with several factors– SAT score, graduation rate, and per-pupil spending – the results showed no significant correlation in any of these comparisons. There was no statistical significance on indicators that used school size as a means to measuring school district competence.

Nevertheless, our research and tests have led us to believe that regionalization could be a viable option for select school districts that are financially unsustainable and inefficient. In many ways, school district regionalization has proven to be a real opportunity to create greater efficiency in state government. Potential cost savings have been shown throughout our analysis of the compiled data. However, based on the research our study was able to complete, we cannot definitely recommend school district regionalization as an absolute solution for the fiscal difficulties of school districts in Massachusetts. In order to better address the problems of school districts in Massachusetts that are looking to improve, local studies of potential consolidation candidates must be undertaken.

Our study of Worcester County has led us to conclude that fully regionalizing school districts in State Representative Gobi's 5th Worcester legislative district is something to seriously consider. Out of the eleven communities in the district, only two, Ware and North Brookfield, are not regionalized. They are relatively small school districts with school district sizes of 1,309 and 627, respectively. Even though our research has shown that school district size does not have a significant impact on the quality of a student's education in Worcester County, there are other benefits of regionalization that could improve student performance while at the same time increasing operational efficiency. Economies of scale and the passage of House Bill 4754 are reasons why these communities should consider the issue of regionalization. If House Bill 4754 becomes law, it would allow for an individual study of these aforementioned communities. Individual studies of Ware and North Brookfield would allow for the residents of these communities to make a fully informed decision on the matter by having a comprehensive analysis of all the factors that go into school district regionalization.

One important point to keep in mind is that our study was carried out in less than seven full weeks. Due to these noteworthy time constraints, we were not able to comprehensively assess all of the underlying factors that affect school district regionalization in Worcester County. While these circumstances did not take away from the proper execution of our project goal, they do suggest that further study is appropriate.

Recommendation 1:

Our first recommendation is the endorsement of Massachusetts State House Bill No. 4754, which is proposed legislation currently in third reading. This bill will eliminate two important roadblocks that affect communities considering regionalization: it will address affected school district employees and analyze individual school districts rather than comparing in generalities. Enacting this bill into state law will allow school districts that are exploring the idea of regionalization to understand more clearly that it is not necessary to adopt the highest pay scale of the schools involved; only that the faculty cannot be paid less than the amount they were receiving before the district consolidation. **The law would also require that an individual analysis of districts with enrollments of fewer than one thousand students be conducted to determine said district's future sustainability.** A comprehensive local study on the topic of school district regionalization will incorporate the socioeconomic and political factors that affect the area that will be investigated.

Recommendation 2:

Our second recommendation is to reevaluate the Chapter 70 budget assumptions. Currently, the cost for each category has only been annually adjusted for inflation. There are other factors that also need to be considered, such as increased cost of education. Updating the Chapter 70 budget assumptions for the underlying costs of student enrollment would modernize current educational

funding standards. This effort should be undertaken in conjunction with the Massachusetts Department of Secondary and Elementary Education and the Massachusetts State Legislature. Updating the formula would improve the fiscal situations of regionalized and non-regionalized school districts throughout Worcester County and the state of Massachusetts.

With these recommendations in mind, it must be made clear that the prospect of school district regionalization is not for everyone. There are many valid arguments for keeping a non-regionalized school district just the way it is. Decisions for communities to regionalize or not should be ultimately settled by the local stakeholders. The concept of regionalization should not be taken lightly and is something that should only be enacted under the proper conditions. We have learned through our experience researching this topic that the education of a child is especially significant to the diverse residential population of Massachusetts. Any decisions on this issue should be made with considerable restraint and always in the best interest of the students involved.

References

Anderson, D.J., Brewer, D.J. & Goldhader, D.D. (1999). A Three-way Error
Components Analysis of Educational Productivity. *Education Economics*,
7(3), 199-208. Retrieved April 24, 2010 from http://au4sb9ax7m.scholar.
serialssolutions.com/?sid=google &auinit=DD&aulast=Goldhader&
atitle=A+three-way+error+components+analysis+of+educational+
productivity&id=doi:10.1080/ 09645299900000018&title=
Education+economics&volume=7&issue=3&date=1999&spage=
199&issn=0964-5292

Andrews, M. (2002). Revisiting economies of size in American education:
are we any closer to a consensus?. *Economics of Education Review,*
21(3), 245–262. Retrieved April 17, 2010 from
http://linkinghub.elsevier.com/retrieve/pii/s0272775701000061

Augenblick, J. & Rooney, K. (2009). An Exploration of District Consolidation.
Retrieved April 24, 2010 from http://www.cosfp.org/HomeFiles/
ServicesConsolidation /ExplorationofDistrictConsolidation.2009.pdf

Bergman, M. (2005, March 28). College degree nearly doubles annual earnings,
U.S Census Bureau Reports. *U.S. Census Bureau Current Population Survey.*
Retrieved April 3, 2010 from
http://www.census.gov/apsd/techdoc/cps/cpsmar04.pdf

Berry, C. R., & West, M. R. (2008). Growing pains: the school

consolidation movement and student outcomes. *Journal of Law,*

Economics, and Organization. Retrieved March 27, 2010 from

http://jleo.oxfordjournals.org/cgi/content/abstract/ewn015v1

Brasington, D. M. (2003). Size and school district consolidation: do

opposites attract?. *Economica, 70* (280), 673–690. Retrieved April 6, 2010 from

http://search.ebscohost.com/login.aspx?

direct=true&db=buh&AN=11280583&site=ehost-live doi:

10.1046/j.0013-0427.2003.01046.x

Britt, M. & Hall, A. (2009, June). Massachusetts Chapter 70. *Harvard Kennedy School of Government.*

Retreived September 26, 2010 from http://www.hks.harvard.edu/ocpa/

pdf/Britt_Hall_PAE.pdf

Bureau of Labor Statistics. (2010). Regional and state umemployment – 2009 annual

averages. *U.S. Department of Labor*. Retrieved September 15, 2010 from

http://www.bls.gov/news.release/pdf/srgune.pdf

Burtless, G.T. (Ed.). (1996). *Does Money Matter: The Effect of School Resources on Student*

Achievement and Adult Success. Washington, D.C.: Brookings Institute Press.

Carleton, S., Lynch, C. & O'Donnell, R. (2009). School district consolidation

in Massachusetts: opportunities and obstacles. *Massachusetts*

Department of Elementary & Secondary Education. Retrieved April 8, 2010 from

http://www.doemass.org/research/reports/1109consolidation.pdf

CollegeBoard. (2010). What is the SAT?. Retrieved April 2, 2010 from

http://sat.collegeboard.com/why-sat

Commonwealth of Massachusetts. (2008). The 186th general court

    House of Representatives (2009-2010). Retrieved March 20, 2010 from

    http://www.mass.gov/legis/member/amg1.htm

Cotton, K. (1996). School size, school climate, and student

    performance. *School improvement research series*, *10*(2), 1–33.

    Retrieved March 26, 2010 from

    http://www.apexsql.com/_brian/School%20Size%20Matters.pdf

Cullen, J.P. (2010). A comparison of the academic performance of college bound high school

    students in regional vs. community high schools in Connecticut. Current Issues in

    Education, 13 (2). Retrieved September 6th, 2010 from

    http://cie.asu.edu/ojs/index.php/cieatasu/article/view/399/23

Darling-Hammond, L. (1999, December). Teacher quality and student achievement:

    a review of state policy evidence. Retrieved April 2, 2010 from

    http:// www.politicalscience.uncc.edu/godwink/PPOL8687/

    WK11March%2029%20Teachers/Darling-Hammond%20Review%

    20essay%20on%20teacher%20quality%20and%20outcomes.pdf

Duncombe, W., & Yinger, J. (2007). Does school district consolidation cut costs?.

    Education Finance and Policy, *2*(4), 341–375. Retrieved March 29, 2010 from

    http://www.mitpressjournals.org/doi/abs/10.1162/edfp.2007.2.4.341

Driscoll, L.E., Mass Small and Rural School District Task Force, Young, N.,

      Gougeon, F., Stevens, P., Millitello, M., Dardenne, P., Doiron, D.,

      &Azar, P.J. (2008). The Effectiveness, Value, and Importance of Small

      School Districts. Retrieved September 2, 2010 from *http://www.leg.wa.gov/*

      JointCommittees/BEF/Documents/Mtg11-10_11-08/

      EffectivenessValueImportance.pdf

Eide, E. & Showalter, M.H. (1998). The effect of school quality on student

      performance: A quantile regression approach. *Economics Letters*, 58(3),

      345-350. Retrieved April 22, 2010 from http://www.sciencedirect.com/

      science?_ob=ArticleURL&_udi=B6V84-3T51RH8-3T&_user=74021&

      _coverDate=03%2F01%2F1998& _rdoc=1&_fmt=high&_orig

      =search&_sort=d&_docanchor=&view=c&_searchStrId=1306861171

      &_rerunOrigin=scholar.google&_acct=C000005878&_version=1&_url

      Version=0&_userid=74021&md5=33dbed9f6bbc1556c75442cee6671c7d doi:10.1016/j.phy

      sletb.2003.10.071

Ferguson, R.F. (1991). Paying for public education: new evidence

      on how and why money matters. *Harvard Journal on*

      Legislation, 28 (2), 465-498.

Fowler Jr, W. J. (1992). What do we know about school size? What

      should we know?. Retrieved March 27, 2010 from

      http://eric.ed.gov/ERICWebPortal/recordDetail?accno=ED347675

Gardner, P.W., Riblatt, S. N., Beatty, J. R. (2000). Academic achievement

    and parental involvement as a function of high school size. *The High*

    School Journal, 83 (2). Retrieved April 16, 2010 from

    http://www.jstor.org/pss/40364507

Gordon, N., & Knight, B. (2008). The effects of school district

    consolidation on educational cost and quality. *Public Finance*

    review, 36(4), 408–430. Retrieved March 28, 2010 from

    http://pfr.sagepub.com/cgi/content/abstract/36/4/408 doi:

    10.1177/1091142107305219

Greenwood G.E. & Hickman C.W. (1991). Educational partnerships.

    The Elementary School Journal. 91(3), 279-288.

Hale, D. (Spring, 1993). Proposition 2 ½ a decade later: the ambiguous

    legacy of tax reform in Massachusetts. *State and Local Government*

    Review, 25(2), 117–129. Retrieved April 18, 2010 from

    https://wpi.illiad.oclc.org/illiad/illiad.dll?SessionID=Y173238848F&

    Action=10&Form=75&Value=10556

Hanley, P. (2005, December 5). Transportation cost changes with statewide school district

    consolidation. *University of Iowa Public Policy Center.* Retrieved September 15, 2010 from

    http://www.sciencedirect.com/science?_ob=MImg&_imagekey=B6V6Y-4HR76N6-1-

    48&_cdi=5827&_user=10&_pii=S0038012105000509&_origin=search&_coverDate=06%2

    F30%2F2007&_sk=999589997&view=c&wchp=dGLzVlz-

    zSkzk&md5=eaa2729d710a85c161adf25e7d483db4&ie=/sdarticle.pdf

Hatch, R., & Cabral, H. (2010). The Massachusetts Foundation Budget. *Massachusetts Department of*

    Education. Retreived September 6, 2010 from

    http://finance1.doe.mass.edu/chapter70/chapter_cal.doc

Hoxby, C. M. (2000). The effects of class size on student achievement:

    new evidence from population variation**.** Retrieved April 10, 2010 from

    http://web.missouri.edu/~podgurskym/Econ_4345/syl_articles/Hoxby

    _Student_Achievement.pdf

Hicks, M., Rusalkina, V., & Drive, O. J. M. (2007). School consolidation and

    educational performance: an economic analysis of West Virginia high schools.

    Center for Business and Economic Research Marshall University.

    Retrieved March 25, 2010 from

    https://www.marshall.edu/cber/research/SchoolConsolidation.pdf

House Bill No. 4754. 186th General Court. 2009-2010 Legislative Session.

Hu, Y., & Yinger, J. (2008). The Impact of school district consolidation on housing

    prices. *National Tax Journal, 61.* Retrieved March 26, 2010 from

    http://www-cpr.maxwell.syr.edu/efap/Publications/Impact_of_Consolidation.pdf

Johnson, N., Williams, W., & Oliff, O. (2010). Governors' new budgets indicate

    loss of many jobs if federal aid expires. *Center on Budget and Policy*

    Priorities. Retrieved April 1, 2010 from

    http://www.cbpp.org/files/2-5-10stim.pdf

Johnson, J. & McNichol, M. (2010). Recession continues to batter state budgets;

    state responses could slow recovery. *Center on Budget and Policy*

    Priorities. Retrieved April 20, 2010 from

    http://www.cbpp.org/files/9-8-08sfp.pdf

Killeen, K., & Sipple, J. (2000). School consolidation and transportation policy:

    an empirical and institutional analysis. *Washington DC: Rural School*

    and Community Trust, 19. Retrieved March 25, 2010 from

    http://www.ruraledu.org/user_uploads/file/school_consolidation

    and_transportation_policy.pdf

Kinney, J. (2010, January 10). Budget cuts limit child care. Retrieved March 30, 2010 from

    http://www.earlychildhoodfocus.org/artman2/publish/impact_of

    _the_economy_on_child_care/Budget_Cuts_Limit_Child_Care.shtml

Krejcie, R. V., & Morgan, D. W. (1970). Determining sample size for research activities.

    Education and Psychological Measurement, 30, 607-610. Retrieved September 5, 2010 from

    http://people.usd.edu/~mbaron/edad810/Krejcie.pdf

Lyson, T. A. (2002). What does a school mean to a community? Assessing the

    social and economic benefits of schools to rural villages in New York. *Journal*

    of Research in Rural Education, 17(3), 131–137. Retrieved March 19, 2010 from

    http://www.peecworks.org/PEEC/PEEC_Research/S0032ECDA-003419BF

Marin County Public Schools. (2004). School administration – is the cost too high?

    Retrieved April 16, 2010 from

    http://www.co.marin.ca.us/depts/GJ/Main/cvgrjr/2003gj/

    SchoolAdministrationFinalReport.pdf

Massachusetts Association of Regional Schools [M.A.R.S]. (2010).

     Member school districts 2009-2010. Retrieved March 25, 2010 from

     http://massassociationregionalschools.org/members.html.

Massachusetts Budget and Policy Center. (2010a). Chapter 70 funding options for

     K-12 education. Retrieved September 6, 2010 from

     http://www.massbudget.org/file_storage/documents/CH70Brief041210.pdf

Massachusetts Budget and Policy Center. (2010b). The FY2011 budget gap and

     chapter 70 support. Retrieved April 1, 2010 from

     http://www.massbudget.org/documentsearch/findDocument?

     doc_id=683&dse_id=945

Massachusetts Department of Elementary and Secondary Education [MDESE]. (2009a).

     Massachusetts comprehensive assessment system overview.

     Retrieved March 20, 2010 from http://www.doe.mass.edu/mcas/overview.html

Massachusetts Department of Elementary and Secondary Education [MDESE].

     (2009b). 2009 MCAS report for grade 10 all students. Retrieved March 20, 2010

     from http://profiles.doe.mass.edu/state_report/mcas.aspx

Massachusetts Department of Elementary and Secondary Education

     [MDESE]. (2009c). 2009-10 teacher data report. Retrieved March 20, 2010 from

     http://profiles.doe.mass.edu/state_report/teacherdata.aspx

Massachusetts Department of Elementary and Secondary Education [MDESE].

     (2009d). 2006-07 SAT report. Retrieved March 20, 2010 from

     http://profiles.doe.mass.edu/state_report/sat.aspx

Massachusetts Department of Elementary and Secondary Education [MDESE]. (2009e).

    Operating Schools: 2009-2010 School Year. Retrieved September 7, 2010 from

    http://profiles.doe.mass.edu/profiles/general.aspx

Massachusetts Department of Elementary and Secondary Education [MDESE]. (2009f).

    School and District Profiles. Retrieved September 7, 2010 from

    http://profiles.doe.mass.edu/help/data.aspx

Massachusetts Department of Elementary and Secondary Education [MDESE]. (2010a).

    Reconstituting the Foundation Budget. Retrieved October 4th, 2010 from

    http://finance1.doe.mass.edu/chapter70/chapter_07_change_detail.doc.

Massachusetts Department of Elementary and Secondary Education [MDESE]. (2010b).

    Steps to form a Regionalized School District. Retrieved September 24, 2010 from

    http://finance1.doe.mass.edu/regional/reg_forming.doc

McArdle, E. (2009, March 8). Together we won't. Retrieved May 1, 2010 from

    http://www.boston.com/bostonglobe/ideas/articles/2009/03/08/together_we_wont/

Nelson, Erik. (1985). School consolidation. *Erik Digest, 13*. Retrieved April 2, 2010 from

    http://www.ericdigests.org/pre-925/school.htm

Nitta, K., Holley, M., & Wrobel, S. (2008). A phenomenological

    study of school consolidation. *Education Working Paper*

    Archive, *20*. Retrieved March 28, 2010 from

    http://coehp.uark.edu/consolidation.pdf

November, S. M., Cromley, R. G., & Cromley, E. K. (1996). Multi-objective analysis of

  school district regionalization alternatives in Connecticut. *The Professional*

  Geographer, *48*. Retrieved March 26, 2010 from

  http://www.informaworld.com/smpp/content~db=all~content=a788912120

Ornstein, A. C. (1993). School consolidation vs. decentralization: trends,

  issues, and questions. *The Urban Review*, *25*(2), 167–174.

  Retrieved March 27, 2010 from

  http://www.springerlink.com/index/QX302G361078784M.pdf

Oxley, Barton, & Klump (2006). Creating Small Learning Communities.

  Principal's Research Review, 1(6), 1-6. Retrieved September 2, 2010 from

  http://principals.org/portals/0/content/54452.PDF

Porter, Kathleen. (2003). The value of a college degree . ERIC Digest.

  Retrieved April 4, 2010 from

  http://isu.edu/ctl/fys/teachResources/docs/

  ValueOfHigherEducationResources.pdf

 Pugh, T. J. (1994). Rural school consolidation in New York State,

  1795-1993: a struggle for control. Retrieved March 27, 2010 from

  http://eric.ed.gov/ERICWebPortal/recordDetail?accno=ED371914

Rowe, K. (2003, October). The importance of teaching quality as a key determinant of

  students' experiences and outcomes of schooling. Retrieved March 28, 2010 from

  http://www.det.nsw.edu.au/proflearn/docs/pdf/Rowe_2003_Paper.pdf

Scheerens, J., Vermeulen, C.J.A.J., & Pelgrum, W.J. (1989). Generalizability of instructional and

    school effectiveness indicators across nations. *International Journal of Educational Research, 13*

    (7), 789-799. Retrieved September 13, 2010 from

    https://www.det.nsw.edu.au/proflearn/docs/pdf/Rowe_2003_Paper.pdf

Strauss, R. P., & Sawyer, E. A. (1986). Some new evidence on teacher and student

    competencies. *Economics of Education Review, 5* (1), 41-48.

Streifel, J. S., Foldesy, G., & Holman, D. M. (1991). The financial

    effects of consolidation. *Journal of Research in Rural Education*,

    7(2), 13–20. Retrieved March 26, 2010 from

    http://scripts.cac.psu.edu/dept/jrre/articles/v7,n2,p13-

    20,Streifel.pdf

Wallin, B., & Snow, D. (2010). Budget Deficits in the States: Massachusetts. Budget deficits in the

    states: massachusetts. *Public Budgeting & Finance*, 30(1). Retrieved September 6th, 2010 from

    http://onlinelibrary.wiley.com/doi/10.1111/j.1540-5850.2010.00950.x/pdf

Warner, W., & Lindle, J. C. (2009). Hard choices in school

    consolidation: providing education in the best interests of

    students and preserving community identity. *Journal of Cases in*

    Educational Leadership, *12*(1), 1–11. Retrieved March 31, 2010 from

    http://jel.sagepub.com/cgi/content/abstract/12/1/1 doi:

    10.1177/1555458908329776

Young, N. (2008). What you are not hearing about small school district

    consolidation. University of Massachusetts. Retrieved April 2, 2010 from

    http://www.math.umass.edu/~hajir/les/What-you-are-not-hearing.pdf

Zimmer, R., & Jones, J. T. (2005). Unintended consequence of

   centralized public school funding in Michigan education.

   Southern Economic Journal, 71(3), 534–544.Retrieved March 27, 2010 from

   http://www.jstor.org/stable/20062058

Appendix A

Sponsor Description

Sponsor: State Representative Anne M. Gobi, Massachusetts House of Representatives

As a member of the Joint Committee on State Administration and Regulatory Oversight, and a legislator for the Massachusetts House of Representatives, State Representative Anne M. Gobi is involved in the state-wide attempt to relieve the education budget crisis.

A main focus in many of the committees that State Representative Gobi serves on is to better the quality of education in the Commonwealth of Massachusetts. However, according to Viser (2008), the current education budget crisis has resulted in Governor Patrick being required to cut roughly $700 million from state spending. This includes spending on education. With school districts that are currently operating independently beginning to struggle financially, State Representative Gobi turned her attention to regionalization as a possible solution.

Representative Gobi is interested in our research for specific use within her district which includes, "Fifth Worcester. - Consisting of precinct A, of the town of Ware, in the county of Hampshire; and the towns of Barre, Brookfield, Hardwick, New Braintree, North Brookfield, Petersham, Phillipston and West Brookfield, precincts 2 and 3 of the town of Spencer, and the town of Templeton, all in the county of Worcester" (The Commonwealth of Massachusetts, 2008, District Represented). Currently, the towns of Barre, Hardwick, and New Braintree are members of Quabbin Regional High School, while Templeton and Phillipston are members of Narragansett Regional High School. In addition, the towns of Petersham and Spencer are both involved in regionalized school districts (Montachusett and Spencer- East Brookfield, respectively). West Brookfield is a part of the Quaboag Regional School District, while Brookfield is associated with Tantasqua Regional High

School. This leaves Ware and North Brookfield as the only two towns in Representative Gobi's district that are not regionalized.

While fiscal efficiency is the main concern for the Massachusetts government, State Representative Gobi has also asked us to include the effects that the regionalization of school districts will have on all parties involved (students, teachers, administrators, parents, and taxpayers).

Appendix B

Teacher Qualification Statistics (2009-2010)

http://profiles.doe.mass.edu/state_report/teacherdata.aspx

Appendix C

2009 MCAS Report

http://profiles.doe.mass.edu/state_report/mcas.aspx

Name of School District	Subject	P+/A %	P %	NI %	W/F %	Total # of Test Takers
Ashburnham-Westminster	ELA	27	59	13	1	176
	MTH	46	42	9	3	177
	SCI	7	59	31	3	164
Athol-Royalston	ELA	27	59	9	5	119
	MTH	28	38	30	4	118
	SCI	16	54	24	5	91
Auburn	ELA	34	54	9	3	175
	MTH	59	25	14	3	174
	SCI	14	57	21	8	169
Berlin- Boylston	ELA	62	33	3	3	76
	MTH	58	26	13	3	77
	SCI	28	57	13	3	72
Blackstone Millville	ELA	39	50	10	1	111
	MTH	52	28	17	4	112
	SCI	8	60	30	3	105
Clinton	ELA	20	54	19	7	135
	MTH	39	35	20	6	133
	SCI	1	49	45	5	121
Douglas	ELA	40	52	5	3	116
	MTH	43	30	23	4	115
	SCI	12	57	27	4	103
Dudley- Charlton	ELA	23	64	10	2	294
	MTH	48	27	19	7	294
	SCI	18	58	21	4	276
Dudley- Charlton	ELA	23	64	10	2	294
	MTH	48	27	19	7	294
	SCI	18	58	21	4	276
Fitchburg	ELA	11	49	30	10	304
	MTH	22	29	34	15	306
	SCI	5	43	39	13	262
Gardner	ELA	25	56	12	7	206
	MTH	40	32	17	11	207
	SCI	6	29	47	18	202
Grafton	ELA	33	48	15	4	186
	MTH	49	22	24	5	187

	SCI	21	43	32	3	173
Harvard	ELA	58	34	6	2	114
	MTH	80	10	7	4	114
	SCI	35	53	8	4	110
Hopedale	ELA	39	53	8	0	79
	MTH	67	18	14	1	78
	SCI	17	60	23	0	70
Leicester	ELA	15	63	21	1	130
	MTH	41	32	24	2	127
	SCI	10	55	33	2	124
Leominster	ELA	17	57	20	6	397
	MTH	36	31	20	12	402
	SCI	12	45	37	7	372
Lunenburg	ELA	44	48	6	2	136
	MTH	58	30	6	6	136
	SCI	20	65	13	2	134
Mendon-Upton	ELA	46	47	5	3	200
	MTH	67	19	8	5	199
	SCI	33	52	12	3	192
Milford	ELA	35	48	13	4	292
	MTH	53	26	14	7	294
	SCI	15	46	34	5	278
Millbury	ELA	21	62	16	1	175
	MTH	39	38	19	4	174
	SCI	11	67	19	3	157
Narragansett	ELA	31	57	12	1	111
	MTH	39	35	23	4	111
	SCI	18	49	31	2	106
Nashoba	ELA	52	41	5	2	219
	MTH	71	19	5	5	222
	SCI	43	47	7	2	203
North Brookfield	ELA	18	61	18	2	49
	MTH	33	41	18	8	51
	SCI	7	50	30	14	44
Northborough-Southborough	ELA	53	42	4	1	360
	MTH	72	20	6	2	361
	SCI	40	47	13	0	343
Northbridge	ELA	20	50	23	7	171
	MTH	31	29	32	8	167
	SCI	12	50	28	10	144
Oxford	ELA	17	54	24	5	129

	MTH	36	33	16	16	129
	SCI	11	52	31	6	109
Quabbin	ELA	33	52	14	0	242
	MTH	52	32	13	3	242
	SCI	25	48	26	1	230
Quaboag	ELA	26	60	10	4	101
	MTH	63	17	17	3	100
	SCI	13	60	22	4	90
Shrewsbury	ELA	53	38	7	3	428
	MTH	65	23	8	5	428
	SCI	26	52	18	4	402
Southbridge	ELA	5	63	27	4	91
	MTH	18	35	34	13	89
	SCI	1	41	41	16	80
Spencer- E. Brookfield	ELA	13	68	15	4	112
	MTH	36	30	26	8	114
	SCI	7	48	36	9	106
Sutton	ELA	55	39	6	0	99
	MTH	63	24	11	2	99
	SCI	28	54	18	0	90
Tantasqua	ELA	21	56	17	5	310
	MTH	49	33	14	5	306
	SCI	16	50	30	4	301
Uxbridge	ELA	22	58	17	4	102
	MTH	46	33	16	4	99
	SCI	4	52	38	5	94
Wachusett	ELA	49	47	4	0	500
	MTH	72	20	7	1	500
	SCI	28	49	22	1	478
Ware	ELA	14	59	19	8	59
	MTH	53	25	12	10	59
	SCI	17	56	22	6	54
Webster	ELA	16	58	17	8	124
	MTH	34	33	21	12	123
	SCI	4	36	45	15	114
West Boylston	ELA	49	37	11	4	76
	MTH	68	21	6	5	77
	SCI	17	60	18	6	72
Westborough	ELA	61	35	3	1	300
	MTH	78	17	4	1	296
	SCI	49	46	4	1	273

Winchendon	ELA	15	57	18	10	97
	MTH	26	32	32	11	98
	SCI	7	38	44	11	87
Worcester	ELA	18	49	24	9	1604
	MTH	30	27	26	16	1597
	SCI	4	30	53	14	1447

Appendix D

SAT Report

http://profiles.doe.mass.edu/state_report/sat.aspx

Name of School District	SAT Reading	SAT Writing	SAT Math	Total Score	Total # of Test Takers
Algonquin	546	547	564	1657	326
Ashburnham-Westminster	524	530	543	1597	134
Athol- Royalston	476	474	497	1447	69
Auburn	499	489	516	1504	138
Blackstone Millville	499	496	492	1487	88
Clinton	508	525	502	1535	121
Douglas	497	490	504	1491	54
Dudley- Charlton	501	506	507	1514	218
Fitchburg	473	461	479	1413	168
Gardner	491	484	488	1463	136
Grafton	505	508	519	1532	156
Harvard	609	613	597	1819	99
Hopedale	524	536	539	1599	65
Leicester	487	482	481	1450	107
Leominster	484	489	493	1466	253
Lunenburg	500	495	528	1523	120
Milford	489	489	518	1496	243
Millbury	498	490	507	1495	116
Narragansett	509	502	510	1521	65
Nashoba	549	544	554	1647	205
Nipmuc	523	510	511	1544	145
North Brookfield	531	503	511	1545	19
Northbridge	490	488	493	1471	115
Oxford	492	485	478	1455	92
Quabbin	515	498	515	1528	189
Quaboag	501	488	502	1491	65
Shrewsbury	524	534	545	1603	314
Southbridge	440	445	470	1355	47
Spencer- E. Brookfield	494	470	500	1464	113
Sutton	514	505	519	1538	93
Tahanto	527	518	515	1560	63
Tantasqua	516	508	534	1558	200
Uxbridge	490	490	500	1480	49
Wachusett	534	530	545	1609	403

Ware	452	462	492	1406	33
Webster	462	453	463	1378	91
West Boylston	492	503	509	1504	71
Westborough	557	562	581	1700	248
Winchendon	484	483	490	1457	53
Worcester- Burncoat	463	458	456	1377	169
Worcester- Doherty	469	467	472	1408	268
Worcester- North	450	440	429	1319	154
Worcester- South	409	399	416	1224	162

Appendix E

2008 Per-Pupil Expenditure

http://profiles.doe.mass.edu/state_report/ppx.aspx

Name of School District	Towns included in District	Regionalized/Non-Regionalized	Per Pupil Spending	School District Size (Number of Students)
Ashburnham-Westminster	Ashburnham and Westminster	R	$10,927	2388
Athol-Royalston	Athol and Royalston	R	$11,013	1682
Auburn	Auburn	NR	$11,526	2399
Berlin-Boylston	Berlin and Boylston	R	$12,201	444
Blackstone-Millville	Blackstone and Millville	R	$9,936	2064
Clinton	Clinton	NR	$10,838	1996
Douglas	Douglas	NR	$8,438	1771
Dudley-Charlton	Charlton and Dudley	R	$9,948	4348
Fitchburg	Fitchburg	NR	$11,782	4997
Gardner	Gardner	NR	$10,153	2600
Grafton	Grafton	NR	$9,180	2902
Harvard	Harvard	NR	$12,429	1277
Hopedale	Hopedale	NR	$9,613	1308
Leicester	Leicester	NR	$10,195	1881
Leominster	Leominster	NR	$10,532	6290
Lunenburg	Lunenburg	NR	$9,740	1702
Mendon-Upton	Mendon and Upton	R	$10,007	2856
Milford	Milford	NR	$10,872	4122
Millbury	Millbury	NR	$11,015	1863
Narragansett	Baldwinville, Phillipston and Templeton	R	$10,196	1575
Nashoba	Bolton, Lancaster, and Stow	R	$12,071	3433
North Brookfield	North Brookfield	NR	$10,911	627
Northboro-Southboro	Cordaville, Northborough and Southboro	R	$12,585	1409
Northbridge	Northbridge	NR	$9,935	2539

Oxford	Oxford	NR	$10,568	2042
Quabbin	Barre, Hardwick, Hubbardston, New Braintree, and Oakham	R	$10,359	3012
Quaboag	Warren and West Brookfield	R	$10,114	1452
Shrewsbury	Shrewsbury	NR	$9,859	5841
Southbridge	Southbridge	NR	$13,104	2166
Spencer- E. Brookfield	East Brookfield and Spencer	R	$10,889	1957
Sutton	Sutton	NR	$9,739	1643
Tantasqua	Brimfield, Brookfield, Holland, Sturbridge, and Wales	R	$10,989	1782
Uxbridge	Uxbridge	NR	$11,140	2002
Wachusett	Holden, Princeton, Paxton, Rutland, and Sterling	R	$9,680	7428
Ware	Ware	NR	$12,478	1309
Webster	Webster	NR	$11,409	1942
West Boylston	West Boylston	NR	$11,077	1013
Westborough	Westborough	NR	$12,890	3581
Winchendon	Winchendon	NR	$11,062	1626
Worcester	Worcester	NR	$12,838	23988

Appendix F

2009 Graduation Rate Report

http://profiles.doe.mass.edu/state_report/gradrates.aspx

Name of School District	Towns included in District	Regionalized/Non-Regionalized	Graduation Rate (%)	Dropout Rate (%)	Matriculation Rate (%)
Ashburnham-Westminster	Ashburnham and Westminster	R	91.7	2.1	89
Athol-Royalston	Athol and Royalston	R	60.9	20.3	64
Auburn	Auburn	NR	84.8	5.5	85
Berlin-Boylston	Berlin and Boylston	R	94.4	1.4	94
Blackstone-Millville	Blackstone and Millville	R	89.9	6	80
Clinton	Clinton	NR	84.1	9.3	87
Douglas	Douglas	NR	87.7	8.8	88
Dudley-Charlton	Charlton and Dudley	R	85.5	5.5	85
Fitchburg	Fitchburg	NR	69.4	17.4	70
Gardner	Gardner	NR	66.7	17.9	89
Grafton	Grafton	NR	84.8	6.1	86
Harvard	Harvard	NR	92.7	5.5	97
Hopedale	Hopedale	NR	92.3	2.6	80
Leicester	Leicester	NR	85.8	7.8	88
Leominster	Leominster	NR	82.5	8	82
Lunenburg	Lunenburg	NR	94.2	2.6	82
Mendon-Upton	Mendon and Upton	R	93.5	2.2	88
Milford	Milford	NR	83.9	10.6	78
Millbury	Millbury	NR	90.2	2	87
Narragansett	Baldwinville, Phillipston and Templeton	R	72.8	16.7	76
Nashoba	Bolton, Lancaster, and Stow	R	94.1	1.4	94
North Brookfield	North Brookfield	NR	84.4	9.4	81
Northboro-Southboro	Cordaville, Northborough	R	95.9	1.6	96

	and Southboro				
Northbridge	Northbridge	NR	80.9	10.4	81
Oxford	Oxford	NR	74.1	12.9	76
Quabbin	Barre, Hardwick, Hubbardston, New Braintree, and Oakham	R	79.9	11.2	80
Quaboag	Warren and West Brookfield	R	89.8	4.5	63
Shrewsbury	Shrewsbury	NR	93.6	2.7	91
Southbridge	Southbridge	NR	57.5	21.9	59
Spencer- E. Brookfield	East Brookfield and Spencer	R	78.1	7.7	72
Sutton	Sutton	NR	89.1	3.6	86
Tantasqua	Brimfield, Brookfield, Holland, Sturbridge, and Wales	R	93.2	3.4	78
Uxbridge	Uxbridge	NR	85.2	4.3	81
Wachusett	Holden, Princeton, Paxton, Rutland, and Sterling	R	90.6	3.5	99
Ware	Ware	NR	48.9	20.2	86
Webster	Webster	NR	66.9	23.6	80
West Boylston	West Boylston	NR	91.3	2.2	85
Westborough	Westborough	NR	93.8	2.4	97
Winchendon	Winchendon	NR	72.2	13	67
Worcester	Worcester	NR	70.1	14.5	81

Appendix G

2007-2008 Teacher Salaries Report

http://profiles.doe.mass.edu/state_report/teachersalaries.aspx

Name of School District	Towns included in District	Regionalized/Non-Regionalized	Average Teacher Salary	Number of Teachers
Ashburnham-Westminster	Ashburnham and Westminster	R	$64,246	154
Athol- Royalston	Athol and Royalston	R	$55,015	129
Auburn	Auburn	NR	$59,995	165
Berlin-Boylston	Berlin and Boylston	R	$60,917	36
Blackstone-Millville	Blackstone and Millville	R	$58,706	155
Clinton	Clinton	NR	$62,164	157
Douglas	Douglas	NR	$53,703	113
Dudley- Charlton	Charlton and Dudley	R	$58,601	281
Fitchburg	Fitchburg	NR	$65,382	382
Gardner	Gardner	NR	$61,980	181
Grafton	Grafton	NR	$61,073	190
Harvard	Harvard	NR	$69,246	86
Hopedale	Hopedale	NR	$57,832	89
Leicester	Leicester	NR	$62,875	129
Leominster	Leominster	NR	$57,856	400
Lunenburg	Lunenburg	NR	$59,180	120
Mendon- Upton	Mendon and Upton	R	$52,224	225
Milford	Milford	NR	$61,961	312
Millbury	Millbury	NR	$63,771	139
Narragansett	Baldwinville, Phillipston and Templeton	R	$66,188	102
Nashoba	Bolton, Lancaster, and Stow	R	$69,388	247
North Brookfield	North Brookfield	NR	$58,774	54
Northboro-Southboro	Cordaville, Northborough and Southboro	R	$70,190	132
Northbridge	Northbridge	NR	$70,056	133
Oxford	Oxford	NR	$58,200	141
Quabbin	Barre, Hardwick, Hubbardston, New Braintree, and Oakham	R	$60,627	207
Quaboag	Warren and West Brookfield	R	$67,843	93
Shrewsbury	Shrewsbury	NR	$60,915	363
Southbridge	Southbridge	NR	$62,802	116

Spencer- E. Brookfield	East Brookfield and Spencer	R	$60,905	139
Sutton	Sutton	NR	$63,251	113
Tantasqua	Brimfield, Brookfield, Holland, Sturbridge, and Wales	R	$64,647	146
Uxbridge	Uxbridge	NR	$65,658	147
Wachusett	Holden, Princeton, Paxton, Rutland, and Sterling	R	$59,370	471
Ware	Ware	NR	$55,328	89
Webster	Webster	NR	$60,260	132
West Boylston	West Boylston	NR	$64,308	82
Westborough	Westborough	NR	$74,375	259
Winchendon	Winchendon	NR	$57,689	126
Worcester	Worcester	NR	$56,369	275

Appendix H

Cullen (2010) study of various school districts in Connecticut

Descriptions and Comparisons of Research Groups
Source: Connecticut Education Data and Research (CEDAR, 2008)

Schools	Size	D R G	Median Income	% Free/ Reduced Meals	% Minority	% College Degree	% White Collar	% Single Parent	% Non-English Speaking	Students Per Computer	Per Pupil Spending
Regional N=12,231											
Region 1	562	E	$56,591	12.6	3.7	29.4	44.5	30.1	1	1.6	$12,305
Region 4	594	C	$82,620	7.3	6	43.9	50.8	16.3	1.7	1.9	$11,046
Region 5	1678	B	$93,868	1.8	12.7	59.1	63.5	12	3.2	3.5	$10,397
Region 6	390	E	$65,759	7.6	2.6	28.7	38.7	13.7	0.2	2.9	$10,395
Region 7	786	C	$84,090	2.1	2	40.8	56.2	13	0.1	2.0	$11,392
Region 8	1026	C	$81,862	3.6	3	45	51.2	15.1	0.1	2.4	$8,365
Region 10	775	C	$84,246	3.1	4.9	42.5	55	5.3	2.1	2.2	$11,016
Region 11	200	F	$64,732	14.8	5.8	21.5	32.6	20.3	0	1.4	$14,210
Region 12	392	C	$83,514	2.6	6.1	39.9	42.7	10.3	0.8	2.1	$13,510
Region 13	1380	C	$79,900	4.8	3.5	40.2	47.8	16.3	0.2	3.4	$10,040
Region 14	836	C	$82,025	4.6	4.5	46.9	52.6	19.6	1.4	3.7	$9,205
Region 15	814	B	$87,671	1.6	7	53	57.4	9.2	2.4	4.1	$9562
Region 16	679	E	$77,260	8.2	4.9	27.6	35.8	8.8	1.9	3.1	$9,705
Region 17	459	C	$88,307	5.6	3.4	48.3	57.9	9	0.4	3.7	$11,732
Region 18	459	C	$78,025	3.8	5.7	55.5	51.9	18.2	1.8	2.9	$13,538
Region 19	1201	C	$70,239	6.8	11.7	50	58.9	17.3	1.7	2.9	$10,291
Means	764.4		$78,794	5.58	5.47	42.02	49.84	14.66	1.19	2.74	$11,044
SD	408.8		$9,829	3.79	2.98	10.67	8.85	5.96	0.99	.82	$663
Community N=7,893											
Bolton	285	C	$81,293	6.2	6.4	47.4	54.1	16.2	0	3.6	$11,706
Canton	515	C	$76,113	3.5	7.2	47.5	58.6	12.3	1.1	4.1	$10,888
Clinton	663	D	$70,776	7.8	9.7	35.9	45.7	16.2	1.3	3.4	$11,854
Coventry	573	E	$65,707	10.6	5	20.8	40.1	22.7	0.3	3.7	$8,234
E. Granby	241	D	$77,852	1.3	11.2	29.8	49.5	20.6	3.6	3.1	$11,919
E. Haddam	387	E	$68,393	5.4	4.7	29.7	41.1	11.1	1.2	3.3	$9,463
E. Hampton	567	D	$70,400	7.8	5	32.6	44.1	22.1	1.4	4.9	$10,467
Ellington	738	C	$81,196	4.4	7.2	36.1	48.5	13	1.7	3.0	$10,111
Granby	687	B	$92,696	3.4	6.7	57.3	65.4	10.9	1.2	3.1	$10,201
Lebanon	581	E	$66,652	8.1	4.3	26.8	43	13.3	0.7	3.6	$9,776
Litchfield	438	E	$66,809	4.8	5.2	36.5	43.6	14	0	3.5	$11,420
Old Saybrook	462	D	$73,409	7.7	11.1	43.3	44	19.9	5	4.3	$11,294
Plymouth	526	F	$65,917	14	5.4	16.4	33.9	18.8	1.5	4.4	$9,013
Portland	362	E	$68,802	9.9	8.4	38.4	41	25.3	0.6	3.0	$11,811
Somers	574	C	$77,795	4.8	4.4	34.9	46.3	9.5	1.2	3.8	$9,747
Westbrook	294	E	$75,568	9.6	6.5	31.9	35.4	19.4	1.7	2.5	$13,984
Means	493.3		$72,711	6.83	6.78	35.33	45.89	16.58	1.41	3.58	$10,527
SD	119		$7,354	3.24	2.26	10.25	8.10	4.80	1.28	.62	$1,148
t probability	.026		.150	.337	.128	.058	.232	.414	.550	.003	.425

Appendix I

FY 2011 Governor's Budget Recommendation

List of MA School districts

http://profiles.doe.mass.edu/state_report/ppx.aspx

Appendix J

Socioeconomic Indicators

http://profiles.doe.mass.edu/search/search.aspx

Name of School District	Towns included in District	Regionalized/Non-Regionalized	% Non-English Speaking	Graduation Rate (%)	Dropout Rate (%)
Ashburnham-Westminster	Ashburnham and Westminster	R	1.2	91.7	2.1
Athol-Royalston	Athol and Royalston	R	2.6	60.9	20.3
Auburn	Auburn	NR	6	84.8	5.5
Berlin-Boylston	Berlin and Boylston	R	2.7	94.4	1.4
Blackstone-Millville	Blackstone and Millville	R	1.9	89.9	6
Clinton	Clinton	NR	27.1	84.1	9.3
Douglas	Douglas	NR	1	87.7	8.8
Dudley-Charlton	Charlton and Dudley	R	3.5	85.5	5.5
Fitchburg	Fitchburg	NR	42	69.4	17.4
Gardner	Gardner	NR	10.1	66.7	17.9
Grafton	Grafton	NR	3.8	84.8	6.1
Harvard	Harvard	NR	2.7	92.7	5.5
Hopedale	Hopedale	NR	5.6	92.3	2.6

Leicester	Leicester	NR	4.7	85.8	7.8
Leominster	Leominster	NR	24.5	82.5	8
Lunenburg	Lunenburg	NR	1.3	94.2	2.6
Mendon-Upton	Mendon and Upton	R	1.6	93.5	2.2
Milford	Milford	NR	22.5	83.9	10.6
Millbury	Millbury	NR	2.9	90.2	2
Narragansett	Phillipston and Templeton	R	0.7	72.8	16.7
Nashoba	Bolton, Lancaster, and Stow	R	3.5	94.1	1.4
North Brookfield	North Brookfield	NR	1.6	84.4	9.4
Northboro-Southboro	Northborough and Southboro	R	3.3	95.9	1.6
Northbridge	Northbridge	NR	2.4	80.9	10.4
Oxford	Oxford	NR	1.9	74.1	12.9
Quabbin	Barre	R	0.7	79.9	11.2
Quaboag	Warren and West Brookfield	R	0.4	89.8	4.5
Shrewsbury	Shrewsbury	NR	18.7	93.6	2.7
Southbridge	Southbridge	NR	35.1	57.5	21.9

Spencer- E. Brookfield	East Brookfield and Spencer	R	1.1	78.1	7.7
Sutton	Sutton	NR	0.4	89.1	3.6
Tantasqua	Brimfield, Brookfield, Holland, Sturbridge, and Wales	R	0.5	93.2	3.4
Uxbridge	Uxbridge	NR	3.6	85.2	4.3
Wachusett	Holden, Princeton, Paxton, Rutland, and Sterling	R	3.8	90.6	3.5
Ware	Ware	NR	1.9	48.9	20.2
Webster	Webster	NR	9.6	66.9	23.6
West Boylston	West Boylston	NR	1.5	91.3	2.2
Westborough	Westborough	NR	22.5	93.8	2.4
Winchendon	Winchendon	NR	3.4	72.2	13
Worcester	Worcester	NR	67.9	70.1	14.5

Appendix K

Population Density

http://www.mma.org/community-info

Towns (Worcester County)	Regionalized/Non-Regionalized	Name of School District	Population Density (Population/Square Mile)
Ashburnham	R	Ashburnham-Westminster	153
Athol	R	Athol-Royalston	361
Auburn	NR	Auburn	1043
Barre	R	Quabbin	123
Berlin	R	Berlin-Boylston	209
Bolton	R	Nashoba	224
Boylston	R	Berlin-Boylston	269
Brookfield	R	Tantasqua	196
Charlton	R	Dudley-Charlton	293
Clinton	NR	Clinton	2642
Douglas	NR	Douglas	215
Dudley	R	Dudley-Charlton	514
East Brookfield	R	Spencer- E. Brookfield	212
Fitchburg	NR	Fitchburg	1458
Gardner	NR	Gardner	945

Grafton	NR	Grafton	325
Hardwick	R	Quabbin	599
Harvard	NR	Harvard	230
Holden	R	Wachusett	469
Hopedale	NR	Hopedale	1216
Hubbardston	R	Quabbin	110
Lancaster	R	Nashoba	252
Leicester	NR	Leicester	485
Leominster	NR	Leominster	1442
Lunenburg	NR	Lunenburg	376
Mendon	R	Mendon-Upton	325
Milford	NR	Milford	1861
Millbury	NR	Millbury	859
Millville	R	Blackstone-Millville	600
New Braintree	R	Quabbin	53
North Brookfield	NR	North Brookfield	229
Northborough	R	Northboro-Southboro	795
Northbridge	NR	Northbridge	832
Oakham	R	Quabbin	91
Oxford	NR	Oxford	513
Paxton	R	Wachusett	307
Phillipston	R	Narragansett	75

Princeton	R	Wachusett	100
Royalston	R	Athol-Royalston	33
Rutland	R	Wachusett	215
Shrewsbury	NR	Shrewsbury	1601
Southbridge	NR	Southbridge	840
Spencer	R	Spencer- E. Brookfield	365
Sterling	R	Wachusett	257
Sturbridge	R	Tantasqua	240
Sutton	NR	Sutton	278
Templeton	R	Narragansett	244
Upton	R	Mendon-Upton	299
Uxbridge	NR	Uxbridge	431
Ware	NR	Ware	287
Warren	R	Quaboag	185
Webster	NR	Webster	1343
West Boylston	NR	West Boylston	613
West Brookfield	R	Quaboag	187
Westborough	NR	Westborough	885
Westminster	R	Ashburnham-Westminster	208
Winchendon	NR	Winchendon	239
Worcester	NR	Worcester	4722

Appendix L

Descriptive Statistics for New York

Variable	Consolidated District		Non-Consolidated District	
	Mean	Standard Deviation	Mean	Standard Deviation
Average Housing Values	92695.55	47212.3	98157.07	38128.49
Mean Rents	459.745	126.539	458.225	115.661
% houshold units with 1-2 bedrooms	32.8	7.4	34.3	8.1
% houshold units with 3-4 bedrooms	61	6.8	59.4	7.2
% houshold units with 5+ bedrooms	6.2	2.4	6.3	2.7
% houshold units built last 10 years	6	2.5	6.2	2.9
% houshold units built last 5 years	8.4	3.4	9.5	6.1
% houshold units built before 1950	46.2	12.2	45.7	12.5
% houshold units attached	0.9	1	1.3	2.7
% houshold units detached	70.1	10.2	68.9	11.8
% houshold units mobile homes	15.9	8.4	14.9	8.2
% houshold units with full kitchen	98.2	1.8	97.9	2.8
% houshold units using gas as heating fuel	24.8	28.2	18.1	25.3
% houshold units using electricity as heating fuel	11.3	5.4	12.6	9.2
% houshold units with all plumbing facilities	98.8	0.9	98.8	1.9
% houshold units owner occupied	60.7	12.7	57.6	16.1
Total Housing Units	360.158	483.736	422.414	588.665
Average Household Income	32126.97	6085.603	32372.59	5937.176
% population black	1.6	3.8	1.9	4.4
% population Hispanic	1.1	1.7	1.6	2.9

% population lived in same house 5 years ago	62.7	6.9	60.6	8.6
% population under 18 years old	19.4	3	19.3	3.2
% households female-headed	15.3	5.7	15.2	6.3
% population over 25 with a BA or better	14.1	6.3	15	8.1
% population below the poverty level	12.2	4.8	11.8	5.6
% population unemployed	6.9	2.2	7.4	3.2
% households with pulic assistance income	7	3	6.7	3.1
Population Density	194.805	626.37	195.429	697.597
Total Enrollment	868.957	776.28	1257.601	773.337
State aid per pupil	3990.937	1244.326	3843.398	1203.478
Expenditure per pupil	8012.815	2473.193	7827.74	2207.215
N		140		1297

Appendix M

Interviews (Alphabetical by Name)

Superintendent Brian McDermott Interview (Tahanto Regional School District)

Thursday, September 23rd, 2010
10:00 AM – 10:30 AM
IQP Interview
Attendees: Sabbir Rashid, Dimitri Loucagos, Alex Alvarez, Superintendent Brian McDermott

1. Please state your background and relevant educational and professional experience.

   - Been a school administrator for over 20 years in Texas and Massachusetts
   - Most of that time as a administrator has been spent in a non-regionalized school district
   - Was a shop teacher for a long time
   - Has a PHD in curriculum instruction

2. How long have you been at your current career position?

   - 3 years

3. What has been the impact of the recent economic recession on the allocation of district funding to the classroom?

   - The economic recession has not cut vital funding for our primary faculty
   - We have had to halt the hiring of secondary support staff and services such as extra school supplies, new textbooks, other non-necessities

4. What are the biggest challenges that you currently face as a superintendent in your school district?

   - The fact that the Tahanto regional school district is actually funded in three separate ways, one funding plan for each town and an additional funding plan for the regional school district
     o Only the 6-12 students from Berlin and Boylston are included in the regional formula
     o Each town has its own school committee as well as the regional school district
   - The 3 separate school district are served, however, by the same central administration

- - Extremely INEFFICIENT because they have to do the same job 3 separate times because each school district gets separate funding
- This model is also confusing at times if you have personnel working across each school district
- If we are able to consolidate these administrative services into one streamlined entity, we would be able to focus more on HELPING STUDENTS AND TEACHERS
- Local politics is a huge roadblock to the streamlining process of administrative consolidation
  - creates a lot of inefficiencies for administration in general also, slows down their work

5. How would you describe the level of academic rigor of the curriculum offered to students?

- The level of academic rigor is not as well as we would like it to be
- Budget cuts have hampered efforts to enhance academic performance
- Personally disputes the fact that regionalization is the only way to provide a greater access and breadth of academic course offerings
- Believes that smaller school districts are able to teach students "deeper" in core subject matter
  - Much greater benefits to the students

6. What caused these districts to merge into a regionalized school?

- Regionalized back in 1959
- It was done to create more cost savings
- Berlin has more of a commercial tax base
- Boylston does not have as diverse of a tax base

Other Notes:

- Chapter 70 funding formula is not working as well practically in the communities
- Participating towns in a regional school district do not have to pay the same rate to send their children to the same school
  - Formula stipulates that a town will contribute whatever it can to the school, based on property values and general assumptions

- However, this has caused the towns in the Tahanto Regional School District to be funded unequally from the state
- This fact has caused anger and lack of cooperation within the school district communities
- This fact has also been one of the sticking points for allowing the tahanto school district to be fully regionalized at the administrative level with Berlin and Boylston

Jennifer Williamson Interview (Policy Analyst, Joint Committee on Education)

Wednesday, September 22nd, 2010
12:00 PM – 12:45 PM
IQP Interview
Attendees: Sabbir Rashid, Dimitri Loucagos, Alex Alvarez, Jennifer Williamson

Questions:

1) Please state your background and relevant educational and professional experience. - DL
   a) Policy Analyst, Joint Committee on Education
      Commonwealth of Massachusetts
      (Government Agency; Government Administration industry)
      June 2010 — Present (4 months)
   b) Legislative Aide, Rep. Geraldo Alicea
      Commonwealth of Massachusetts
      (Government Agency; Government Administration industry)
      May 2008 — June 2010 (2 years 2 months)
      Intern
2) What has the Joint Committee on Education been doing in the area of education reform? Has there been a big push for legislation involving school regionalization? - SR
   a) Regional planning grants for schools willing to explore the idea of regionalization ($450000)
   b) Changing transportation funding – regional school districts will be reimbursed for transportation costs
3) As you probably know, the Lieutenant Governor is the chair of the Regionalization Advisory Commission, a committee whose job has been to make recommendations on how to make

government more efficient by removing duplication of services. One of recommendations include the endorsement of school regionalization where it makes sense. What kind of relationship has the committee had with the Governor's office on the topic of school regionalization and education reform in general? – DL

    a) Governor's office has taken interest in the idea of regionalization – did not comment on Governor's official position.

        i) Regionalization Grant Program

4) Are there any bills being reviewed that regard education? – DL

    a) Bill 4754 – UNDER REVIEW AS OF 9/22/10 – Not recommending regionalization, neutral position

        i) Section 1: clarifies current language set in law regarding teacher salaries

        ii) Section 2: establishes Regional Advisory Committee to study the costs, benefits, issues, etc. of regional school districts (already part of law)

        iii) Section 3: Once committee releases report, Commissioner of elementary and secondary education will begin a review of school districts with less than 1000 students – will they be able to sustain themselves or would they be better off collaborating with another district. Will provide cost benefit analysis of regionalization to municipal districts.

5) What kind of funding is available for schools exploring the idea of regionalization? – SR

    a) State grants – as mentioned before ($450K to explore regionalization)

    b) Regionalization Planning Grants – schools have to apply for this funding

        i) Ex: Ayer-Shirley, Berkley- Somerset

            (1) Received money to study regionalization, after which they decided it was a good idea

6) With many towns and districts struggling to allocate sufficient funding to their schools, what do you think the most significant barrier is in terms of approaching regionalization? – SR

    a) Cultural barrier

    b) Aligning of curricula, technology

    c) Representation on regional school committees

    d) Contribution to foundation budget

    e) Teacher salaries – most schools think that law states that if they regionalize, right up front they have to adopt the highest pay scale of the districts involved (NOT TRUE)

    f) CH 70 FUNDING FORMULA

g) Not enough information available to school districts

7) As you know, the Commonwealth of Massachusetts allocates funding for public schools using the Chapter 70 funding formula, which stipulates school districts be funded through a combination of state and local aid. Many critics of the law say that the funding formula is partial to communities that qualify for low-income education funding and communities with a diverse tax base. Do you think that the Chapter 70 funding formula is fair in its allocation of funding? What are its advantages/disadvantages? – DL

a) Allocated based on need.

i) Wealthier communities contributing more to foundation budget

Roger Hatch Interview (Massachusetts Department of Secondary and Elementary Education)

Friday, October 1st, 2010
10:00 AM – 11:00 AM
IQP Interview
Attendees: Sabbir Rashid, Dimitri Loucagos, Alex Alvarez, Roger Hatch

1. Please state your background and relevant educational and professional experience.

- First started working at Massachusetts Department of Secondary and Elementary Education in 1980
- Left for the Massachusetts Department of Revenue, Division of Local Services in 1980
- Has experience dealing with public finance from a municipal and educational point of view
- Came back to the Massachusetts Department of Secondary and Elementary Education in 1996
- Is currently the School Finance Programs Administrator

2. Could start from the beginning and give us a brief historical overview of the Chapter 70 law and the reasons for passing it?

- Precursors of the Chapter 70 law can be traced back to as far back as 1919
- However, 1993 was the real starting point for the current Chapter 70 law under the Massachusetts Education Reform Act
- Established the requirement in 1993 to be required to spend a certain amount of money on education: foundation budget

- The foundation represents what it takes to provide an adequate education
- At the time, only 60% of communities were at foundation budget level
    - During the rest of the 1990's, the state provided supplemental aid to communities that were not able to initially meet their Chapter 70 obligations
    - At the end of the decade, all of the communities that were not able to provide sufficient funding to the formula were able to do so
- Hancock vs. Driscoll court case lead to the Fiscal Year 2007 changes to the Chapter 70 budget formula
    - Consolidated cost categories associated to student enrollment from 18 to 11
    - Implemented statutory changes in Chapter 70 to stabilize the amount of aid the state pays to communities
    - Wealthy towns receive less state money, less affluent towns get more money
    - Instead of adding money annually adjusting for inflation, the newly changed formula required a balance in state and local aid using property taxes

3. What kind of influence has the federal government had on education spending in Massachusetts?

- Federal education greatly increased after Fiscal Year 2009 through the Stimulus Bill
- The federal programs are called the SFSF and EduJobs funding grants in the Chapter 70 state aid formula
- Grants make it hard to calculate the adequate level of spending required under the Chapter 70 law
- Governor Patrick recommended that we calculate the foundation budget necessary including federal grants through the Chapter 70 law

4. Can you point to any loopholes or inadequacies in the Chapter 70 formula?

- Beginning in Fiscal year 2007, following the Hancock vs. Driscoll court case, the Commonwealth established a floor of state aid of 17.5% for wealthier communities
- This was done as a political compromise
- They have the ability to adequately fund their school mostly through local funding
- even though wealthier communities are not allowed to spending more than 82.5% of local aid, there are several communities that have education budgets entirely funded by the state
    - Athol-Royalston
    - Lawrence

5. How do you calculate each one of the eleven categories of cost associated with enrollment in Chapter 70? What mechanism do you use to base your expenditures on?

- Operationally, the Chapter 70 budget calculations are adjusted for inflation using a special percentage for state and local government that the federal government calculates each year
- Uses assumptions underlying the foundation rates, which were calculated in Fiscal Year 1994
- The values for the underlying assumptions have not been adjusted annually and instead have only been adjusted for inflation
- The is the case for all of the categories
- One of the first complaints for the foundation budget is that there is not enough money
- The fact that the cost categories have not been updated since 1994 is a valid complaint
- Surprised that Hancock vs. Driscoll court case did not address the antiquated formula
- The main reasons behind the lack of reform in this part of the Chapter 70 formula has been politics
- Legislators do not want to back a proposal that would require communities to spend even more than they usually are doing
  - Public would be weary of additional taxes
  - There would need to be public support of the measure for the law to be fully funded if enacted
  - If not, would be another type of law like the No Child Left Behind Act
- The school education finance experts are also not in total agreement about what level of funding adequately provides the best level of education
  - If state implemented updated assumption for the formula, they would probably hire outside consultants to write the new legislation
  - The level of adequate education usually depends on the consultant that you hire to create the legislation

Interview with Dr. Stephen Hemman (Executive Director,
Massachusetts Association of Regional Schools)

Friday, September 24rd, 2010
10:00 AM – 10:45 AM
IQP Interview
Attendees: Sabbir Rashid, Dimitri Loucagos, Alex Alvarez, and Dr. Stephen Hemman

1. Please state your background and relevant educational and professional experience.

    - Educator at Fitchburg State College (currently)
    - Superintendant for Naragansett Regional District 2000 - 2008 (retired 2 years ago)
    - MARS Executive Director (currently)
    - Doing consulting work with a number of districts looking to regionalize

2. What does the Massachusetts Association of Regional Schools do?

    - Represents regional schools, both vocational and academic

- Concerned with what legislation gets passed and how it affects their membership
  - Establishing stabilization funds - work with DOE, secretary's office, and others to change laws to become easier to use
- Works with districts looking into regionalization, provide information
  - Upton-Mendon, Ayer-Shirley, Somerset-Berkeley, Southwick-Tolland
- Constantly emailing people updates
- General meetings throughout the year
  - Speakers are brought in
- Currently preparing outline on how to regionalize
  - no existing step by step direction/prototype to becoming a regional school
- Monthly meetings, after which an hour and a half profession development for superintendants to understand how a regional district operates in conducted
- Worked with Regional Planning Commission, on school district sustainability

3. What are the biggest advantages of regionalizing a school district?
- Ideal size of school district is 2500 - 3000 students
- More opportunities for curriculum and activities
- Adequate courses are available
- Save money through economies of scale by creating one central office, rather than individual committees
  - Money saved is used on schools
- Examples of schools that now have one central office
  - Ayer-Shirley, K-12
  - Mahar- split district, 4 towns, Orange, Petersham, New Salem, Wendel, central office for 7-12 regional district, K-8 belong to different unions

4. What are some examples of cost savings in Regionalization?
- Mahar now has one sped director rather than two.
  - Saves money, better service
- Transportation reimbursed
- Better operational costs
- Government promotions
- Government grants

5. What are some disadvantages to regionalization?
- Single school committee
- Single administration
- Coordinating curriculum
- Single salary
- Problems between towns when one has to put more money in than the other
  - For example, Bridgewater-Raynham, Dennis-Yarmouth

- Duplicate efforts
- Reluctant to change in fear of loss of control depending on how communities view education
6. What are some challenges your organization has faced in trying to promote regionalization?
   - Main concern is FY12 Budget
     - Current budget is supported by FED government, money which is bound to "dry up"
   - Sales tax reduction
   - Funding for transportation costs have been reduced
   - Cultural problems
   - Teacher Salary Bargaining
7. Chapter 70 Funding?
   - In order to change chapter 70 funding, has to be brought to legislature
   - Minimum amount -- Foundation budget -- has to be spent on education
   - Problem is, minimum amount is not enough
   - Look at contribution from town - minimum based on wealth of the town
   - Subtraction from foundation
   - Result is chapter 70 funding
8. Things to look up:
   - mass.gov recently passed municipal relief bill
   - studies on regionalization on department of education website
   - central office capacity in regional school districts

Douglas School Official (via phone)
(Douglas School District)

Tuesday, September 21st, 2010
10:00 AM – 10:30 AM
IQP Interview
Attendees: Sabbir Rashid, Dimitri Loucagos, Alex Alvarez

Questions:

1. How long have you been at your current career position? – AA

- 5 years.

2. What has been the impact of the recent economic recession on the allocation of district funding to the classroom? - AA

- Spending 84% of resources on teacher salary
- Makes it hard to obtain necessary materials to teach and upgrade resources such as student technologies, computers

3. What are the biggest challenges that you currently face as a superintendent in your school district? - DL

- Trying to provide adequate educational services with minimal resources to a growing school district
- Economic recession has hit the community hard, especially in the tax base
- Chapter 70 funding not working for communities in between rich and poor
- Funding grants for school district going to communities that have much more poverty
- Suggestion: look at the 2 court cases challenging Chapter 70 funding law

4. What part of school district funding has been affected the most? - DL

- Managed to make it through first two years of economic recession by cutting back on secondary materials such as books and computers
- However, still a small part of the budget
- 2009 was the first time that the school district had to cut back staff, had to reduce a lot of staff to part-time opportunities
- Different grade levels are experiencing different student to teacher ratios due to different population sizes

5. How would you describe the level of academic rigor of the curriculum offered to students? - AA

- Strong, school was accepted into the math and science initiative
- AP classes in 6 different areas, advanced classes beginning for grade 8

6. Is class size a significant issue at your school? - AA

- 1800 students
- class size increasing
- increase of 60 students over one year
- classes size not as small as they would like

7. If this school district were to regionalize with a neighboring school district, do you foresee any positive or negative social or educational impacts? – DL

- positive would have been the ability to provide better for the students
- negative lose community identity

8. Are you for or against the idea of regionalizing/decentralizing your school district? - DL
- Regionalization would not be a good option, already a big enough school
- Do not think it would improve economic conditions
- Douglas considered regionalization with Sutton but community did not want to