TO:	Board of Directors, Massachusetts School Building Authority
FROM:	Maureen G. Valente, Chief Executive Officer
	John K. McCarthy, Executive Director, Deputy Chief Executive Officer
SUBJECT:	Construction Methodologies: Design Bid Build and Construction Management at Risk Summary Level Information and Comparative Data
DATE:	March 9, 2016

As part of the agency objectives overview that was discussed at our November Board meeting, we have been assessing our current practices and policies. During this assessment, staff have been reviewing the construction methodologies used by districts for projects funded to date.

Included with this memorandum are:

1) A comparison of the Design Bid Build and Construction Management at Risk contracting structures, Attachment A; and
2) A draft memo that includes a summary of the Core Program by project type and the utilization of construction delivery methods, Attachment B.

DESIGN BID BUILD V. CONSTRUCTION MANAGEMENT AT RISK
CONTRACTING STRUCTURE

DESIGN BID BUILD

1. DBB is a Single Phase "Fixed Price“ Construction Contracting Method.
2. Under DBB, a Public Owner must procure an Owner’s Project Manager to act as its Representative during the Design and Construction of the Project and a Designer to prepare the Project Design.
3. When the Design is complete, the Owner openly solicits Public Bids from every General Contractor that meets a list of statutorily defined public bidding eligibility requirements.
4. The Bid Solicitation requires a single Lump Sum Bid Price to complete all of the Work included in the Design.
5. The Owner must award the Construction Contract to the Lowest Responsible Eligible Bidder.

CONSTRUCTION MANAGEMENT AT RISK

1. CMR is a Two Phase "Cost Plus" Construction Contracting Method.
2. When using a CMR, a Public Owner must procure an Owner’s Project Manager to act as its Representative during the Design and Construction of the Project and a Designer to prepare the Project Design.
3. Before the Design is prepared, the Owner retains a CMR through a systematic Qualifications Based Procurement Process.
4. The CMR provides advice during the Design Phase regarding constructability and budget and then Constructs the Project, as designed.
5. The CMR Contract Price will be the sum of the CMR’s Cost to Construct the Work plus the General Conditions (CMR’s Costs that are not incorporated into the Project) and a negotiated CM Fee, as compensation.
6. When the Design is at least 60% complete, the Owner and the CMR will agree upon a Guaranteed Maximum Price ("GMP") as a cap for the Contract Price. Once the GMP is established, the CMR will be paid the lesser of the Contract Price or the GMP.

Attachment A

ADVANTAGES

DESIGN BID BUILD

1) Competitive Bidding is the hallmark of DBB contracting and, assuming the Project Design is clear and complete and all Prequalified Bidders are capable of effectively completing the work, that competition should produce the best available price.

2) A DBB General Contractor is obligated to construct all of the Work that is delineated in the Project Design for a single, Lump Sum Fixed Price. This places the risk for the cost of completing the Work included in the Design entirely on the General Contractor.

3) The Work and the Schedule to complete that Work are narrowly defined in a DBB General Contract and that simplicity should concomitantly simplify management of the Project, provided the Design is clear and straight forward.

CONSTRUCTION MANAGEMENT AT RISK

1) Qualifications Based Procurement is the hallmark of CMR contracting and that ability allows the Owner to identify CMRs that are the most capable of constructing the Owner's Project and to choose a CMR for the Project from that pool.

2) A CMR is available during the Design Phase to work with the Designer to identify Design conflicts and omissions prior to construction. Any significant Design conflicts and/or omissions that are not identified and corrected prior to construction will adversely impact the Project Schedule and/or lead to claims for additional compensation. The CMR's assistance during the Design Phase should drastically reduce that possibility.

3) The CMR contracting process is flexible and provides an Owner with the ability to creatively progress a Project through methods such as having the CMR begin construction before a Design is completed.

DISADVANTAGES

DESIGN BID BUILD

1. A DBB General Contractor is not available to help identify Design conflicts and omissions prior to construction. Any significant conflicts and/or omissions that are not corrected prior to construction will adversely impact the Project Schedule and/or lead to claims for additional compensation.

2. With DBB, an Owner must solicit Public Bids from every General Contractor that meets the statutorily defined public bidding eligibility requirements and award the construction contract to the "Lowest Responsible Eligible Bidder". However, that bidder may not be the best choice to construct the Project. If a Project is complex, an Owner will likely want to identify Contractors that are the most capable of constructing the Project and choose a Contractor to construct the Project from that pool. DBB does not have a legal mechanism to achieve that objective.

3. With DBB, a Designer prepares the Design, General Contractors Bid on that Design, and the "Lowest Responsible Eligible Bidder" constructs the Project. This "linear" process restricts the Owner's ability to creatively progress the Project through methods such as having the Contractor begin construction before the Design is completed.

CONSTRUCTION MANAGEMENT AT RISK

1. Subject to the GMP, a CMR is reimbursed for the Cost of Work and paid a fee as compensation. This places the risk for the cost of completing the work up to the amount of the GMP upon the Owner.

2. Massachusetts Law requires the Owner of a DBB Public Building Construction Project to solicit separate competitive bids from Subcontractors for work that is included in eighteen (18) key sub-trade categories. The Sub-Bid Solicitation is not issued until the Design of the work is completed and each Sub-Bidder is required to submit a single Lump Sum Bid Price to complete all of the Work that is included in a sub-trade category. A list of those Sub-Bids is provided to General Bidders prior to the date of the General Bid Opening and the General Bidders are required to include separate sub-bid fixed prices for the 18 sub-trade categories in their General Bids. With some differences, the law is also applicable to CMR contracting. Given the significant fixed price cost liability for subcontract work, a GMP for a CMR Contract under GL c. 149A will not typically be set until the entire Design is completed. That delay transfers most of the risk for the cost of completing the work to the Owner, obviating the potential for any cost savings that may have been available through competition.

CONCLUSIONS

DESIGN BID BUILD

1) The process is best suited to projects with straight forward Designs.

CONSTRUCTION MANAGEMENT AT RISK

1. The contracting process is best suited to projects with complicated Designs and/or strict schedule limitations.

Attachment B

TO:	Maureen G. Valente, Chief Executive Officer John K. McCarthy, Executive Director, Deputy Chief Executive Officer
FROM:	Michael McGurl, Project Manager Mary Pichetti, Director of Capital Planning
SUBJECT:	Construction Methodologies: Design Bid Build (DBB) and Construction Management at Risk (CMR) Summary Level Information and Comparative Data
DATE:	March 9, 2016

As part of the MSBA's objectives, staff have been reviewing current MSBA practices and policies. In conjunction with this initiative, MSBA staff have looked at the construction delivery methods used by districts participating in the MSBA's Grant Program.

The purpose of this memorandum is: (1) to provide an overview of the quantity, project scope and procurement type for Core Program projects authorized for a Project Funding Agreement between April 2008 and July 2014; and (2) to summarize the utilization of construction delivery methods, Design Bid Build ("DBB") and Construction Management at Risk ("CMR"), for these projects.

This memorandum includes:

- Brief MSBA Process Overview
- Overview of DBB and CMR Construction Delivery Methods
- Summary Data for Core Program Projects

Brief MSBA Process Overview

When seeking collaboration from the MSBA, a Massachusetts school district files a Statement of Interest ("SOI") informing the MSBA of its schools' conditions and needs. If a district wishes to study the potential of a major repair, renovation, addition, or new building, the district's SOI is considered for invitation to the MSBA's Core Program. If invited, a district goes through the process of procuring an Owner's Project Manager ("OPM") and Designer. With its consultants, the district studies potential solutions to address its building needs. Once the final solution is identified by the district and approved by the MSBA, the district appropriates funding for the project and executes a Project Funding Agreement ("PFA") with the MSBA. The PFA memorializes the scope, budget, and schedule developed by the district and establishes the reimbursement rate by which the district will receive funding from the MSBA.

During the feasibility study and schematic design phases of a Core Program project, the district, with the guidance of its OPM and Designer, considers the construction method to complete its school project. If the estimated contract cost is $5 million or greater, the district can select between the CMR and DBB construction delivery methods. Similar to studying the potential of

a major repair, renovation, addition, or new building, the selection process for the construction method includes an evaluation of many factors. These factors can include the condition of the existing building and site, project complexity, the district's academic calendar, and the project budget. The MSBA looks to a district and its consultants to evaluate and determine the most appropriate construction methodology for the proposed project. The MSBA provisionally includes one incentive point should a district choose the CMR delivery method, subject to the district receiving approval from the Office of the Inspector General to utilize this method. The incentive point was instituted to encourage districts to consider CMR, newly established through Massachusetts General Law Chapter 149A in 2004, and to spur new contractors to participate in the public school building industry.

DRAFT

Core Program and its Projects

Beginning in November 2007, the MSBA Board of Directors began approving the invitation of school projects to its Core Program. Based upon districts' level of readiness to proceed into design and construction, school projects began receiving authorization to execute a Project Funding Agreement ("PFA") from the MSBA's Board of Directors in April 2008. For purposes of this comparison, staff have reviewed projects starting in April 2008 that have completed the bid process by July 2015 for a total data set of 125 Core Program projects

The following charts have been developed to illustrate the history of project invitations to the Core Program. Core Program projects are categorized by the MSBA into the following scope options: Repair, Renovation, Addition/Renovation, New Construction, and New Construction – Model School.

Figure 1 illustrates the 125 projects authorized for PFAs by year between April 2008 and July 2014. The projects are further identified by the project scope.

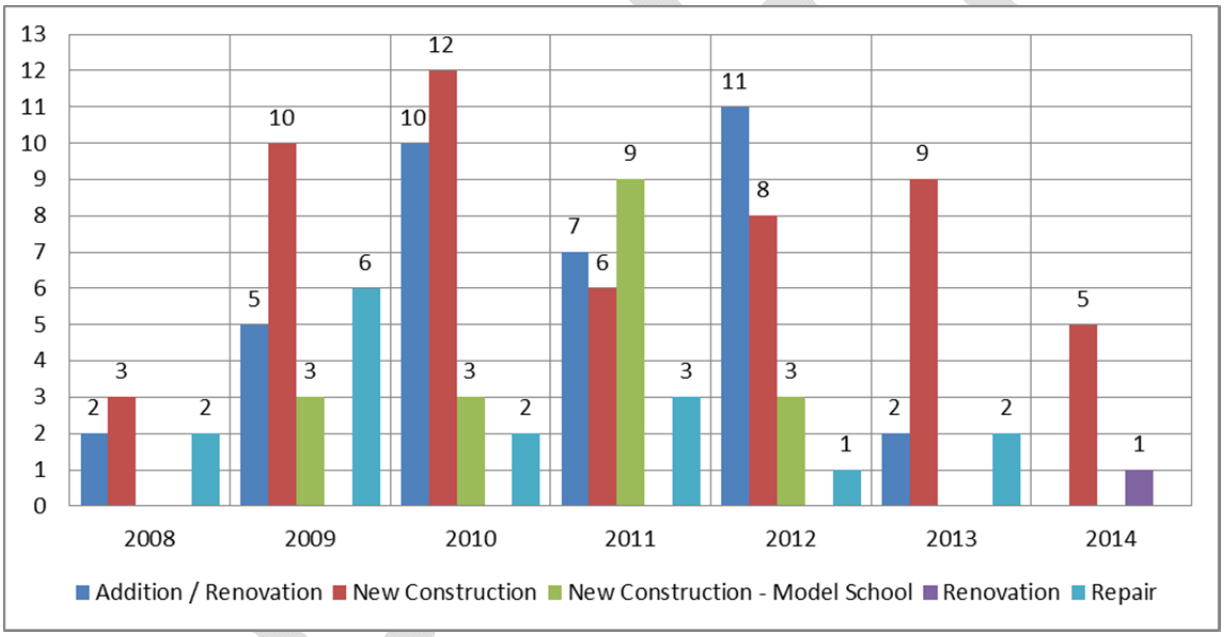


Figure 1

In reviewing Figure 1, the following can be observed:

- The year with the most projects is 2010.
- Implementation of the Model School Program can most notably be seen in the project totals in 2011.
- Project totals in 2014 are a partial representation of the year's activity due to the reporting criteria's timeline through July 2014.

For purposes of this review, projects with estimated construction costs of less than $5 million have been removed from the data, as they cannot be considered for the Construction Manager at

Risk ("CMR") delivery method, which reduces the number of projects in the data set from 125 to 115. The ten projects excluded from this analysis include three Addition/Renovation projects and seven Repair projects. Separating the remaining 115 Core Program projects by construction method, the MSBA entered into a PFA for 66 Design Bid Build ("DBB") projects and 49 CMR projects (See Figure 2).

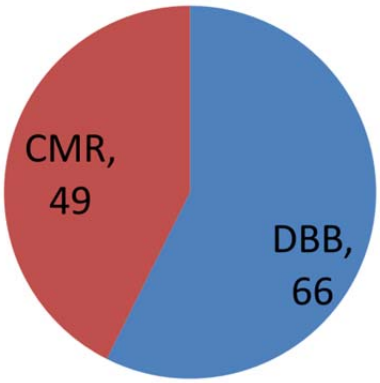


Figure 2

Figure 3 illustrates the 66 DBB projects separately by their project scope and Figure 4 represents a similar breakdown of the 49 CMR projects.

DBB Methodology

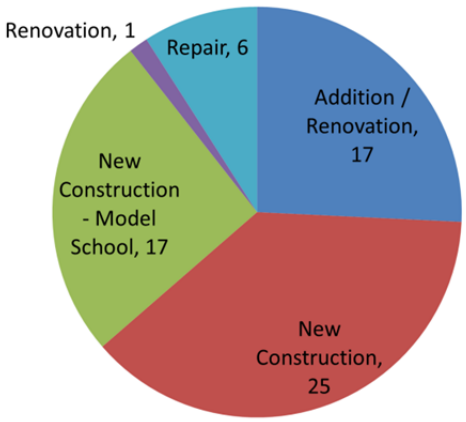


Figure 3

CMR Methodology

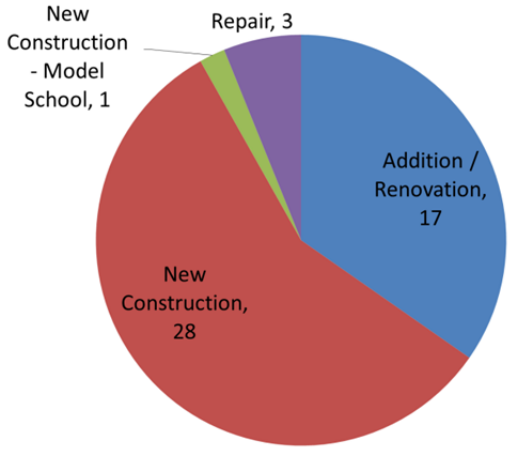


Figure 4

In reviewing the Figures, it can be further noted that 17 of the 18 Model School projects utilized DBB. The one CMR Model School project was authorized for a PFA in 2011. While both delivery methods have been used for 17 Addition/Renovation projects, the totals represent a higher percentage of CMR projects (35%, 17 of 49) than DBB projects (26%, 17 of 66). Meanwhile, 59% (29 of 49) of CMR projects and 64% (42 of 66) of DBB projects were new construction, either New Construction or New Construction - Model School.

Utilization of Construction Delivery Methods: CMR & DBB

To evaluate the application of the construction delivery methods, trends must be considered within the rate of utilization, the project scope, and the pool of contractors. This section includes information regarding the rate of utilization, utilization by project scope, utilization by contracting firm and bid activity.

Rate of Utilization

In October, 2009, the Office of the Inspector General issued "Experience of Massachusetts Public Agencies with Construction Management at Risk under M.G.L. c. 149A." Following legislative approval of Massachusetts General Law Chapter 149A in 2004, the Office of the Inspector General reported that prior to August, 2008, the number of school projects with approval to use the CMR construction method was seven, including one public charter school.

Since 2008, districts and their consultants have become more familiar with CMR. The familiarity in the construction method has led to an increase in districts using CMR. Our analysis shows that the number of school projects using the CMR method now matches the number of projects using the DBB method for qualifying projects. The consistent utilization of the CMR construction method has led to changes in the number of contractors pursuing CMR projects.

Figure 5 illustrates the 115 projects with estimated construction costs of more than $5 million authorized for PFAs between April 2008 and July 2014. The projects are further identified by their construction method.

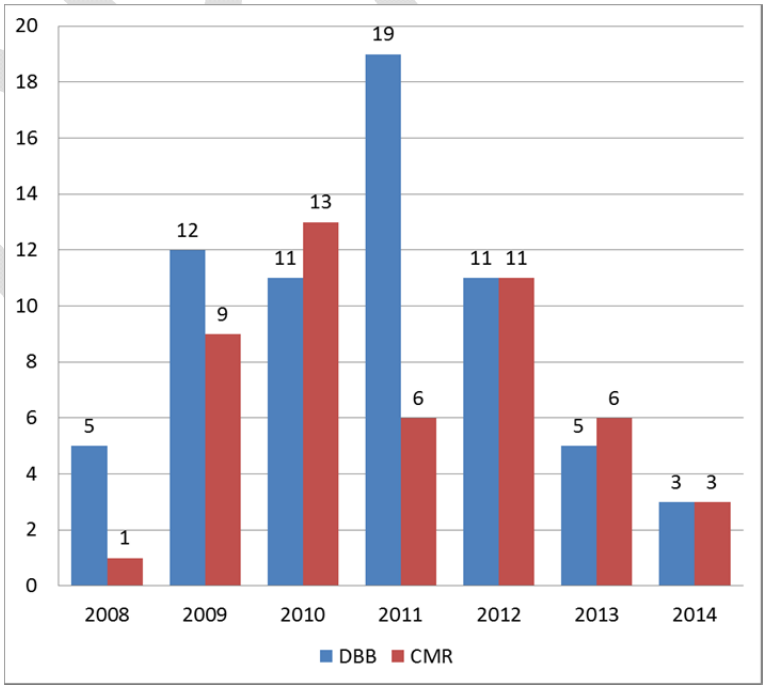


Figure 5

With the exception of 2011, the number of CMR projects per year since 2010 equals or exceeds the number of DBB projects. Utilization of construction methods in 2011 is affected by the approval of a PFA for nine Model School projects using the DBB methodology. Figure 5 illustrates that school districts have and continue to consider the CMR construction method when completing their projects.

Utilization by Project Scope

Figure 6 illustrates the number of DBB and CMR projects with estimated construction costs of more than $5 million as well as the year in which they were authorized for a PFA. Figure 6 further separates projects by their scope.

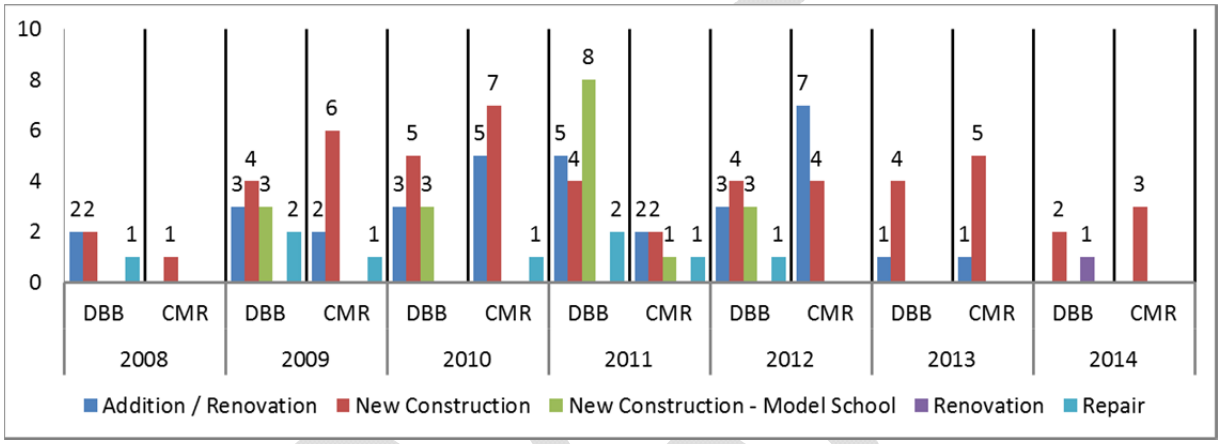


Figure 6

Figures 7 and 8 have been included to more clearly illustrate the breakout by project type. Figure 7 shows the breakdown by project type and year for all DBB projects. Figure 8 shows the breakdown by project type and year for all CMR projects.

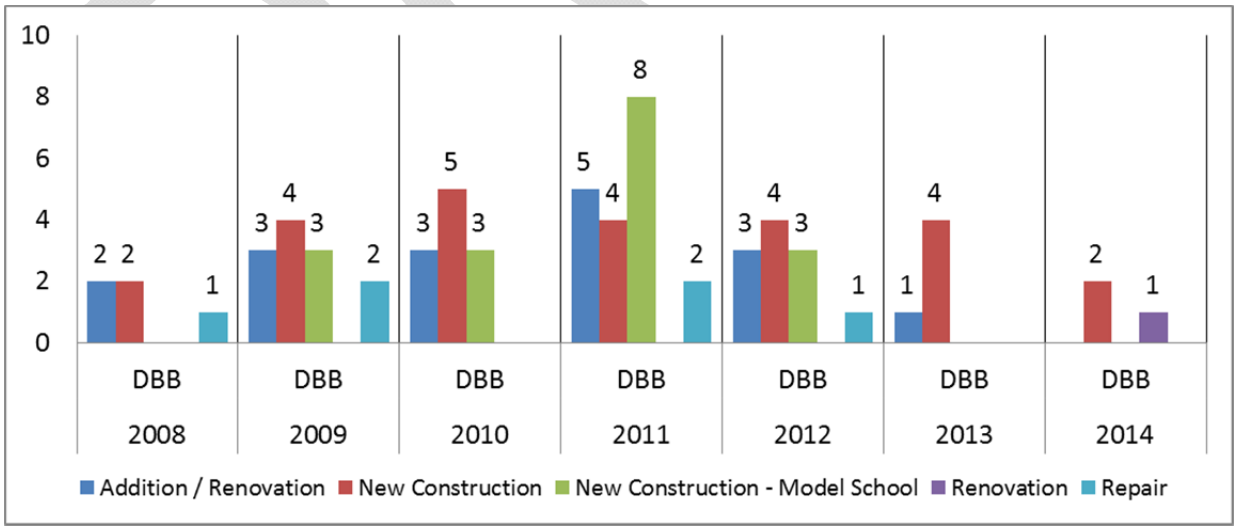


Figure 7

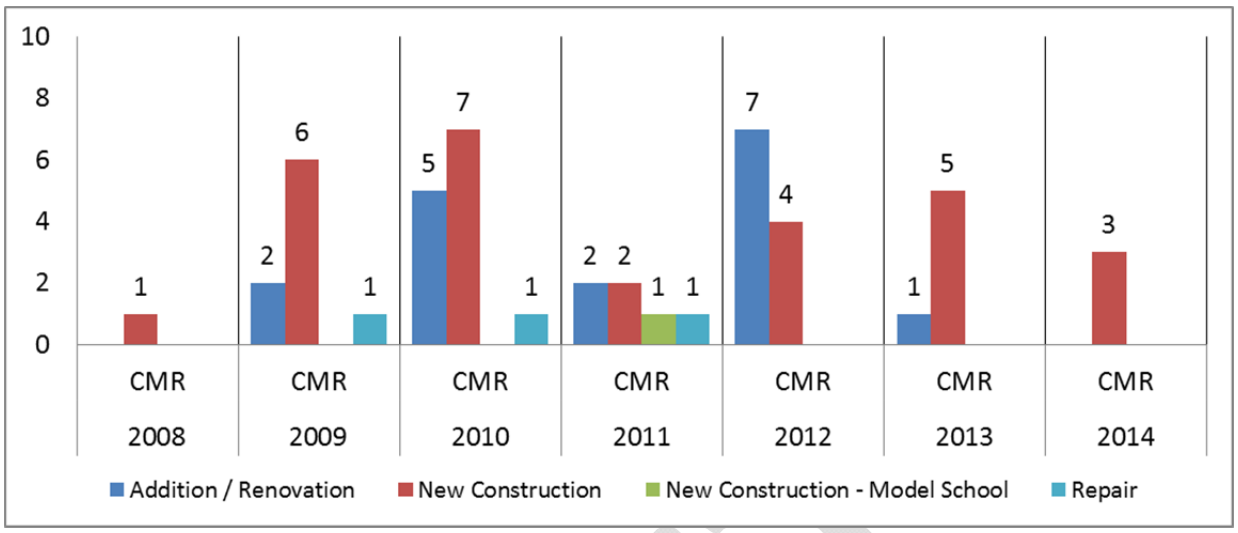


Figure 8

Similar to Figure 5, Figures 7 and 8 illustrate that the total number of projects using each methodology are similar year to year. Of note is that the ratio of Addition/Renovation projects using CMR, 17 of 49 (35%) projects, is slightly higher than the ratio of Addition/Renovation projects using DBB, 17 of 66 (26%) projects.

Utilization by Contracting Firm

When evaluating the number of CMR and DBB projects, it is also important to understand how many contractors are performing the work. By encouraging districts to consider CMR, the incentive point was intended to spur new contractors to participate in the public school building industry. As previously noted, the 115 projects with estimated construction costs of more than $5 million include 66 DBB projects and 49 CMR projects. The 66 DBB projects were awarded to 19 contractors and the 49 CMR projects were awarded to 13 contractors. Three contractors were awarded at least one project from both construction methods.

	Design-Bid-Build	Construction Manager at Risk
Total Projects	66	49
Awarded Contractors	19	13
Contractors with Two or More Projects	10 (53% of projects)	8 (62% of projects)
Projects Awarded to Two Most Active Contractors	32 (48% of projects)	23 (47% of projects)

Table 1

Table 1 illustrates that many contractors have had success obtaining a second public school project regardless of the construction method. Table 1 also shows that the two most active contractors for their respective construction methods have obtained similar percentages of the total projects.

DRAFT

Focusing on the 66 DBB projects, Table 2 illustrates the number of projects awarded to the 19 DBB contractors based upon the year that bids were received. Additional observations can be made for Table 2:

- Of the 19 contractors, 15 performed on three or fewer projects.
- The most projects awarded to one contractor in a given year between 2008 and 2014 are 6 in 2013.
- The pool of DBB projects continued to grow with at least one new contractor each year.

Contractor	**2008**	**2009**	**2010**	**2011**	**2012**	**2013**	**2014**	**2015**	**Total**
CTA Construction Co., Inc.	1	2	4	2	3	6	1	1	20
Agostini Construction Co., Inc.		1				1			2
Callahan, Inc.		1							1
Colantonio, Inc.| New England Builders & Contractors, Inc.| R.M. Technologies, Inc.		1							1
Groom Construction Co., Inc.		1							1
Bacon Construction Co, Inc.			1						1
Brait Builders Corp.			1	1	3	1		1	7
Fontaine Brothers, Inc.			3	3	1	2	3		12
G & R Construction, Inc.			1		2				3
J & J Contractors, Inc.			1	1					2
P.J. Stella Construction Corp.			1						1
Bacon-Agostini Construction Joint Venture				1	2		1	1	5
H.V. Collins Co., Inc.				1	1				2
Nauset Construction Corporation				1					1
Colantonio, Inc.					1				1
Enfield Builders, Inc.						1			1
PDS Engineering and Construction, Inc.						2	1		3
J.J. Cardosi, Inc.							1		1
L.D. Russo, Inc.								1	1
Total	1	6	12	10	13	13	7	4	66

Table 2

DRAFT

Table 3 illustrates the number of projects awarded to the 13 CMR contractors based upon the year of GMP execution.

Contractor	2010	2011	2012	2013	2014	2015	Total
Consigli Construction Company, Inc.	2	3	3	2	2		12
Gilbane Building Company	2	5		3		1	11
Shawmut Design and Construction	1	1		3	1	2	8
Skanska USA Building, Inc.	1			1			2
Turner Construction Company	1			1			2
Agostini Construction Co., Inc.		1					1
CTA Construction Co., Inc.		1					1
Dimeo Construction Company		1	1				2
W. T. Rich Company Inc.		1	2			2	5
Morganti/Aquadro & Cerruti			1	1			2
Bond Brothers, Inc.				1			1
Fontaine Brothers, Inc.					1		1
Walsh Brothers, Inc.					1		1
Total	7	13	7	12	5	5	49

Table 3

Additional observations can be made for Table 3:

- Of the 13 contractors, 9 performed on three or fewer projects.
- The most projects awarded to one contractor in a given year between 2010 and 2015 are 5 in 2011.
- Prior to 2015, the pool of CMR projects continued to grow with at least one new contractor each year.

Bid Activity

To further understand trends in contractor participation, the MSBA collected bid data from the 115 projects. To collect contractor information for each school, the MSBA requested project participants to identify the applicable contractors for the following categories:

- Request for Qualifications ("RFQ") - Information Requests (CMR ONLY)
- RFQ Responses (CMR ONLY)
- Qualified Contractors
- Request for Proposals ("RFP") Responses/Bids Submitted

The effort resulted in bid data for 64 of the 66 DBB projects. Table 4 identifies the average number of contractors qualified to bid on the individual projects as well as the average number of contractors who submitted bids. Table 4 separates the data set by bid year.

DRAFT

GMP Executed (Year)	Total Projects	Qualified Contractors	Bids Submitted
2008	1	9	6
2009	6	9.3	5.8
2010	12	8.7	6.2
2011	10	7.4	5.8
2012	13	7.8	5.5
2013	13	6.8	4.2
2014	6	5.8	3.5
2015	3	3.7	3.0

Table 4

Table 4 shows a decline in the number of DBB contractors qualified for bidding since 2009. The number of bids submitted for DBB projects also shows a decline beginning in 2011. For each of the three 2015 projects, three bids were submitted.

Bid data was collected for 47 of the 49 CMR projects. Table 5 identifies the average number of contractors for each of the four pursued categories with projects compared within the same year based upon GMP execution.

GMP Executed (Year)	Total Projects	RFQ - Information Requests	RFQ Responses	Qualified Contractors	RFP Responses
2010	7	11.7	9.6	5.6	5.1
2011	12	11.7	8.8	5.2	4.6
2012	7	8.1	6.7	5.3	4.3
2013	11	6.8	6.5	5.2	4.1
2014	5	7.0	7.0	5.6	5.2
2015	5	6.6	6.6	4.8	4.0

Table 5

By 2012, Table 5 shows that Districts were able to expect close to seven RFQ responses when seeking qualified CMR contractors. The results of the qualification process then lead to an annual average of 4.0 to 5.2 CMR contractors submitting proposals for consideration.

DRAFT

Summary

In developing this information, MSBA staff notes the following:

Process Overview:

- The MSBA looks to a district and its consultants to evaluate and determine the most appropriate construction methodology for a proposed project.

Core Program and its Projects

- Separating the 115 Core Program projects in the data set by construction method, the MSBA entered into a PFA for 66 DBB projects and 49 CMR projects (See Figure 2);
- 59% (29 of 49) of CMR projects and 64% (42 of 66) of DBB projects were new construction, either New Construction or New Construction - Model School; and
- While both delivery methods have been used for 17 Addition/Renovation projects, the totals represent a higher percentage of CMR projects (35%, 17 of 49) than DBB projects (26%, 17 of 66).

Utilization

- With the exception of 2011, the number of CMR projects per year since 2010 equals or exceeds the number of DBB projects;
- The 66 DBB projects were awarded to 19 contractors and the 49 CMR projects were awarded to 13 contractors;
- Table 4 shows a decline in the number of DBB contractors qualified for bidding since 2009. The number of bids submitted for DBB projects also shows a decline beginning in 2011. For each of the three 2015 projects, three bids were submitted; and
- By 2012, Table 5 shows that Districts were able to expect close to seven RFQ responses when seeking qualified CMR contractors. The results of the qualification process then led to an annual average of 4.0 to 5.2 CMR contractors submitting proposals for consideration.

DRAFT