



TO: Massachusetts Program Administrators (PAs), Massachusetts Energy Efficiency Advisory Council (EEAC) Consultants

FROM: Betty Tolkin and Melissa Meek, NMR Group

SUBJECT: Analyses of Immediate Code Compliance Support Initiative Residential Training Surveys on 2012 IECC—January through April 2016

CC: Pam Rathbun, Tetra Tech; Lynn Hoefgen, NMR Group; Allen Lee, Cadmus Group; Althea Koburger, Cadmus Group

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This memo provides analyses of the immediate survey responses collected through paper surveys, registration data, and Audience Response Systems (ARS) from six CCSI residential trainings on the 2012 IECC code held from January through April of 2016. CLEAResult, the CCSI contractor, held four trainings on Envelope and Building Science (EBS) on January 13, February 4, March 31, and April 5. CLEAResult held two trainings on HVAC and Indoor Air Quality (HVAC-IAQ) on March 10 and April 28. Out of an estimated 144 training attendees, 116 attendees filled out paper survey forms.

Of the survey respondents, 31 were building code officials and the remaining 85 fell into the general category of builders, architects, contractors, equipment suppliers, and others. Not everyone who turned in a survey form answered all the questions; the number of respondents for each individual survey question is shown in the appropriate table.

The tables in this memo are similar to the ones provided on 10/31/14, 12/29/14, 3/13/15, 7/10/15, and 12/23/15. Most of the statistics provided in this memo are from the January through April 2016 residential trainings. In addition, we provide some overall statistics based on cumulative responses from all 42 residential trainings held from September 2014 through April 2016; these are labeled as “2014 to 2016.” This memo highlights how responses have evolved over the 44 residential trainings held through April of 2016.

It is important to note that the January through April 2016 attendees provided fairly positive feedback on the residential trainings, similar to the immediate survey responses for the earlier trainings. The most recent immediate survey respondents rated individual components of the HVAC-IAQ trainings slightly higher in terms of usefulness and the EBS components about the same compared to past trainings, as shown in Table 1 and Table 3. The most frequent suggestions for improvement, as shown in Table 13, are to provide more detail on code requirements, provide additional trainings in the future, and to spend more time on documentation. There are certainly more trainings planned for the latter part of 2016 in preparation for the 2015 IECC code being adopted. CLEAResult has also been working on documentation assistance. Overall, feedback from the last residential trainings on the 2012 IECC code indicates a high level of satisfaction among the trainees and perceived usefulness for the areas covered.

As outlined in the amended work plan dated May 5, 2015, NMR provided summaries of the findings from the immediate residential training surveys to the PAs and EEAC every other

month in 2014 and three such summaries in 2015. The trainings covered in this memo are the last residential classroom trainings based on the 2012 IECC code; trainings on the 2015 IECC code started in August 2016. In 2016, NMR is providing this summary of the trainings held on the code based the 2012 IECC and an additional summary of trainings held through the end of the year on the code based on the 2015 IECC. Cadmus has provided four summaries of findings from the immediate commercial training surveys to date, and will be providing two summaries in 2016 broken down into trainings based on the 2012 IECC code and those based on the 2015 IECC code. These interim deliverables are designed to provide early feedback to PAs, EEAC, and implementers on how well specific aspects of the trainings are being received.

Usefulness and Quality

The surveys asked respondents to rate the usefulness of eight to ten components of the trainings on a 1-to-6 scale in which 6 is extremely useful and 1 is not at all useful. As shown in Table 1, mean ratings for EBS training components ranged from 4.6 to 5.2, while mean ratings for HVAC-IAQ training components ranged from 4.8 to 5.6 (Table 3). The most recent January through April usefulness ratings for the EBS trainings are similar to the ratings for all the trainings in 2014 through 2016 while the most recent usefulness ratings for the HVAC-IAQ trainings are slightly higher for most components than the ratings for all the trainings in 2014 through 2016.

The survey respondents overwhelmingly rated all the training components listed as 4, 5, or 6 in terms of usefulness. The most highly rated components were ventilation (HVAC-IAQ), indoor air quality (HVAC-IAQ), ductwork (HVAC-IAQ), air barrier and insulation installation (EBS), and insulation (EBS). Builders and others gave slightly higher mean ratings than code officials to the various training components throughout all the trainings.

The immediate surveys also asked if the material in the various components was new to the respondents (Table 2 and Table 4). As was the case in the earlier trainings, fewer respondents answered this question than provided ratings of usefulness. The HVAC-IAQ components were slightly more likely than the EBS components to be new for the respondents. The training components most likely to contain new information for the attendees were the Mass Save New Construction incentives (EBS and HVAC-IAQ), the cost of change from 2009 to 2012 IECC (EBS), and the 2012 IECC overview (HVAC-IAQ). For most components, builders and others were more likely than code officials to say the material was new to them throughout all trainings.



Table 1. Usefulness Ratings for Envelope Building Science Training Components

		Rating of Usefulness for Jan. thru Apr. (percent)							Mean Ratings			
Training Component	n	6— Extr. Useful	5	4	3	2	1—Not at all Useful	NA/ Don't Know	Jan. thru Apr.	2014 through 2016		
										All	Code Officials	Builders /Others
Cost of change: 2009 to 2012 IECC	64	25%	36%	16%	6%	11%	2%	5%	4.6	4.6	4.4	4.7
Prescriptive, trade-off, performance compliance paths	65	29%	40%	18%	9%	3%	0%	0%	4.8	4.9	4.9	5.0
Insulation	69	38%	39%	14%	6%	3%	0%	0%	5.2	5.1	5.1	5.2
The enclosure: foundation, etc.	68	40%	35%	16%	7%	1%	0%	0%	5.0	5.1	5.0	5.2
Air barrier and insulation installation	68	46%	35%	15%	3%	1%	0%	0%	5.2	5.3	5.2	5.3
Blower door testing	67	33%	39%	19%	6%	3%	0%	0%	4.9	4.9	4.9	5.0
Case study - High performance enclosures	67	30%	33%	22%	6%	1%	3%	4%	4.8	4.8	4.8	4.8
Lighting requirements	67	27%	33%	19%	10%	1%	6%	3%	4.6	4.7	4.7	4.7
Stretch code	66	30%	32%	18%	9%	8%	2%	2%	4.8	4.7	4.6	4.8
Mass Save New Construction incentives	66	29%	35%	21%	5%	5%	3%	3%	4.7	4.7	4.6	4.9



Table 2. Whether the Envelope Building Science Training Components Were New

Component	Jan. thru Apr.		2014 through 2016					
			All		Code Officials		Builders and Others	
	n	Yes	n	Yes	n	Yes	n	Yes
Cost of change: 2009 to 2012 IECC	37	51%	299	42%	146	30%	153	54%
Prescriptive, trade-off, performance compliance paths	37	32%	305	29%	152	18%	153	39%
Insulation	37	14%	381	17%	198	17%	183	18%
The enclosure: foundation, etc.	37	30%	299	22%	147	20%	152	25%
Air barrier and insulation installation	38	13%	304	24%	151	25%	153	24%
Blower door testing	39	18%	302	21%	147	18%	155	25%
Case study - High performance enclosures	37	32%	277	40%	135	39%	142	41%
Lighting requirements	36	14%	335	30%	178	29%	157	31%
Stretch code	37	32%	280	24%	136	18%	144	29%
Mass Save New Construction incentives	37	57%	337	47%	179	42%	158	51%



Table 3. Usefulness Ratings for HVAC Indoor Air Quality Training Components

		Rating of Usefulness for Jan. thru Apr. (percent)							Mean Ratings			
Training Component	n	6— Extr. Useful	5	4	3	2	1—Not at all Useful	NA/ Don't Know	Jan. thru Apr.	2014 thru 2016		
									All	Code Officials	Builders/ Others	
2012 IECC overview	44	45%	41%	11%	0%	0%	0%	2%	5.3	5.2	5.2	5.3
Indoor air quality	44	57%	36%	7%	0%	0%	0%	0%	5.5	5.2	5.2	5.3
Ventilation	44	66%	27%	7%	0%	0%	0%	0%	5.6	5.3	5.3	5.4
Ductwork	44	57%	36%	7%	0%	0%	0%	0%	5.5	5.3	5.2	5.4
Stretch code	42	48%	36%	10%	7%	0%	0%	0%	5.2	4.7	4.7	4.9
System sizing*	43	40%	35%	19%	5%	2%	0%	0%	5.0	4.8	4.8	4.9
Mechanical systems/equipment for super-efficient homes	43	47%	33%	12%	7%	0%	0%	2%	5.1	5.0	4.9	5.1
Lighting requirements	38	47%	21%	16%	13%	0%	3%	0%	4.9	4.8	4.7	4.9
Mass Save New Construction incentives	41	29%	37%	20%	7%	2%	2%	2%	4.8	4.8	4.8	5.0



Table 4. Whether the HVAC Indoor Air Quality Training Components Were New

Component	Jan. thru Apr.		2014 through 2016					
			All		Code Officials		Builders and Others	
	n	Yes	n	Yes	n	Yes	n	Yes
2012 IECC overview	20	50%	188	36%	127	28%	61	52%
Indoor air quality	19	21%	180	27%	122	25%	58	31%
Ventilation	19	32%	243	29%	154	25%	89	37%
Ductwork	19	26%	214	23%	146	18%	68	34%
Stretch code	18	28%	166	25%	115	17%	51	43%
System sizing	18	33%	200	35%	124	32%	76	39%
Mechanical systems/equipment for super-efficient homes	18	33%	203	39%	139	39%	64	39%
Lighting requirements	16	25%	201	27%	139	22%	62	39%
Mass Save New Construction incentives	17	35%	203	39%	142	41%	61	34%



Respondents also gave high ratings to the quality of the presentations (Table 5), with mean ratings ranging from 4.2 to 6.0 on a 6-to-1 scale in which 6 is excellent and 1 is poor. The highest ratings went to the presenter’s skills. Almost all respondents (ranging from 84 percent to 100 percent) said they would recommend the training to others. The latest training quality ratings are similar to ratings for all residential trainings from 2014 through 2016, with the presenter’s skills and the handling of participant questions getting the highest ratings and the quality of handout information getting the lowest rating. The handout information ratings from the most recent respondents are, however, higher than those from all 2014 through 2016 respondents. This is likely due to the availability of an enhanced handout package starting on November 9, 2015. The new handouts include about two-thirds of the slides used in the trainings (picture slides are excluded) and other information.

Table 5. Quality of Trainings
(Mean ratings on a 6 to 1 scale)

General Category	1/13 EBS	2/4 EBS	3/10 HVAC- IAQ	3/31 EBS
n	17	24	2	32
Presenter’s skills	5.7	5.8	6.0	5.7
Quality of slide information	5.5	5.7	5.0	5.3
Quality of handout information	5.5	5.6	5.0	5.3
Handling of participant questions	5.8	5.7	6.0	5.8
n	17	24	2	34
Percent recommending training to others	88%	100%	100%	94%
General Category	4/5 EBS	4/28 HVAC- IAQ	All Trainings Jan thru Apr	All Trainings 2014 thru 2016
n	13	24	112	1076
Presenter’s skills	5.3	5.5	5.6	5.6
Quality of slide information	4.9	5.5	5.4	5.3
Quality of handout information	4.2	5.6	5.3	4.9
Handling of participant questions	5.6	5.6	5.7	5.5
n	13	24	114	1051
Percent recommending training to others	84%	96%	94%	96%

The training attendees also provided feedback on the training quality through an Audience Response System (ARS) used during the presentations to indicate how much the respondents



agreed with certain statements on a scale of 1 (strongly agree) to 6 (strongly disagree)¹. As shown in Table 6, most trainees strongly agreed that the trainer was organized, prepared, knowledgeable, and informative. Most also felt that the trainer kept an appropriate pace and encouraged participation. Finally, more than nine out of ten respondents strongly agreed or agreed that they would recommend the training to others. While the ARS statements are not directly comparable to the paper survey questions in Table 5, the responses confirm that, in general, the respondents rate the quality of the trainings fairly highly. Moreover, the mean ratings for January through April 2016 are slightly better than the ratings for all the previous trainings that had used an ARS.

Table 6. ARS Ratings of Training Quality

Statement	n*	Agreement with Statement (Percent)						Mean	
		1— Strongly Agree	2	3	4	5	6— Strongly Disagree	Jan. thru Apr.	2014 thru 2016
The trainer was organized and prepared	87	77%	13%	1%	1%	5%	3%	1.5	1.7
The trainer encouraged participation	44	89%	5%	5%	0%	2%	0%	1.2	1.5
The trainer was knowledgeable and informative	40	83%	10%	2%	2%	2%	0%	1.3	1.5
The trainer kept an appropriate pace	49	86%	10%	2%	0%	2%	0%	1.2	1.5
I would recommend this training	42	81%	10%	2%	0%	5%	2%	1.5	1.6

*Not all statements were assessed at each training.

Use of Training

The immediate surveys asked respondents to estimate when they would be conducting final inspections of housing units permitted under 2012 IECC (building code officials) or have the units they were working on undergo final inspections (builders and others). Many respondents could not answer this question because they work in cities and towns that have adopted the stretch code or they work mostly on renovations.

Only 19 out of all 116 survey respondents indicated that they had at least some housing units currently permitted under 2012 IECC and 24 indicated that they had some final inspections of 2012 IECC units conducted. Table 7 shows the numbers of permitted units and inspections reported by the trainees who responded to this question for the January through April 2016 trainings; Table 8 shows the numbers of permitted units and inspections reported by all of the trainees who responded to this question from 2014 through 2016.

¹ Data was not recovered from the EBS training on March 31 due to an ARS software malfunction.

Table 7. Housing Units Permitted under 2012 IECC for January through April 2016 Trainees

Number of Housing Units	Currently permitted		Final inspections to date		Final inspections expected within one year	
	Code officials	Builders and others	Code officials	Builders and others	Code officials	Builders and others
n	5	14	6	18	3	10
Less than five	0	4	1	7	1	1
Five to ten	1	4	1	6	0	4
Eleven to 100	4	5	3	5	1	5
More than 100	0	1	1	0	1	0

*The number of responses is shown on this table since all the sample sizes are less than 20.

Table 8. Housing Units Permitted under 2012 IECC for 2014 through 2016 Trainees

Number of Housing Units	Currently permitted		Final inspections to date		Final inspections expected within one year	
	Code officials	Builders and others	Code officials	Builders and others	Code officials	Builders and others
n	169	113	115	76	118	97
Less than five	21%	64%	37%	54%	12%	50%
Five to ten	26%	17%	19%	21%	16%	25%
Eleven to 100	40%	17%	33%	24%	58%	23%
More than 100	13%	2%	11%	1%	14%	2%

The surveys asked respondents who could not estimate the number of housing units under 2012 IECC and were not in stretch code communities to estimate when they would conduct a final inspection on such a unit or have a final inspection conducted on a unit they were working on. As shown in Table 9, more than two-fifths said they expect a final inspection in the next three months; an additional one-fifth in roughly a year; and the remainder were unsure.

**Table 9. When Expect a Final Inspection on a 2012 IECC Unit
(Percent)**

Expected Final Inspection	January through April			2014 through 2016		
	Code Officials	Builders and Others	Total	Code Officials	Builders and Others	Total
n	11	35	46	237	138	375
In the next three months	7	40%	46%	51%	37%	46%
In the next four to six months	0	14%	11%	18%	11%	15%
In the next seven to twelve months	0	11%	9%	12%	16%	14%
More than a year from now	1	0%	2%	2%	6%	3%
Unsure	3	34%	33%	17%	30%	22%

*The number of responses is shown where the sample size is less than 20.

The surveys also included a simpler timing question—namely, when the respondents first expected to use something learned at the training. As shown in Table 10, close to two-thirds of respondents (65 percent) said they expect to use the training immediately with an additional 24 percent saying they expected to use it within the next three months. The overall percentage of those expecting to use what they had learned in the training within three months is similar to that provided from all the trainings from 2014 through 2016. These consistent responses indicate that the trainings are providing useful information with immediate applications even for attendees in areas that did not adopt the 2012 IECC.

**Table 10. When Expect to First Use Training Information
(Percent)**

Expected Use of Training	January through April			2014 through 2016		
	Code Officials	Builders and Others	Total	Code Officials	Builders and Others	Total
n	31	84	115	583	478	1061
As soon as I walk out the door	77%	61%	65%	68%	55%	62%
Sometime in the next three months	10%	29%	24%	19%	29%	24%
In the next four to six months	10%	6%	7%	9%	10%	9%
In the next seven to twelve months	0%	5%	3%	2%	4%	3%
More than a year from now	3%	0%	1%	2%	1%	2%
Not likely to ever use it	0%	0%	0%	0%	0%	0%

Most Important Information and Other Qualitative Data

Respondents who attended the EBS trainings found the 2012 IECC code changes, insulation requirements, and air barrier information to be the most important new information provided by the trainings, while those attending the HVAC-IAQ trainings considered ventilation options and requirements, more general HVAC requirements, and 2012 IECC code changes the most important new information provided (Table 11). Other areas mentioned moderately often included duct placement sizing and testing (HVAC-IAQ) and air sealing information (EBS).

Table 11. Most Important New Information Provided by the Trainings (January through April 2016)
(Percent; multiple response)

General Category	EBS	HVAC-IAQ	All Jan. through April Trainings
n	46	26	72
2012 IECC code changes	18%	19%	18%
Insulation requirements	18%	3%	12%
Ventilation options and requirements	4%	25%	11%
HVAC requirements	0%	25%	9%
Air barrier information	14%	0%	9%
Air sealing information	7%	3%	6%
Duct sealing	2%	6%	3%
Stretch code information	2%	6%	3%
Duct work, including duct placement, sizing, and testing	0%	9%	3%
2012 to 2015 IECC code changes	5%	0%	3%
Vapor barriers	5%	0%	3%
Technical support, web resources, and manuals available	2%	3%	2%
Air infiltration or leakage	2%	0%	1%
Reaffirmation of current knowledge	2%	0%	1%
ASHRAE standards	2%	0%	1%
Enclosure requirements	2%	0%	1%
Foundation options and requirements	2%	0%	1%
Lighting requirements	2%	0%	1%
Everything—general overview	9%	0%	6%
Other	5%	0%	3%

Building code officials mostly said they would use this information during their inspections and initial planning or permit approval. Builders and others also mostly said they would use this information during initial planning and getting permits approved, relay it to their contractors and colleagues, and use it in general during the construction process (Table 12). The responses from the January through April 2016 trainings are fairly similar to those from the earlier trainings, except that respondents in the latest trainings were more likely to say they would relay the information provided to builders and contractors. This may be due to more energy efficiency consultants taking these trainings near the end of the 2012 IECC code cycle.

Table 12. How Information Provided by the Trainings Will Be Used
(Percent; multiple response)

General Category	January through April			2014 through 2016		
	Code Officials	Builders and Others	Total	Code Officials	Builders and Others	Total
n*	16	55	71	354	311	665
During inspections	4	1%	5%	35%	2%	20%
During initial planning/permit approval	7	15%	20%	19%	20%	19%
During construction process/apply to building practices	0	13%	10%	2%	22%	11%
Relay to builders or contractors	2	16%	14%	12%	8%	10%
Code enforcement	2	0%	2%	13%	0%	7%
As a reference	1	10%	9%	3%	8%	5%
Educate homeowners	2	4%	5%	5%	5%	5%
Current projects	2	6%	7%	2%	4%	3%
Future projects	0	7%	5%	0%	5%	2%
Making projects code compliant	0	4%	3%	1%	4%	2%
During audits/HERS ratings	0	3%	2%	0%	4%	2%
During construction process applied to HVAC work	0	6%	4%	0%	3%	2%
Share information with own staff	0	1%	1%	2%	3%	2%
On retrofits/renovations	0	4%	3%	1%	2%	1%
Not used due to stretch code	1	0%	1%	1%	0%	1%
To differentiate oneself from competitors	0	4%	3%	0%	2%	1%
Use air barrier information	0	1%	1%	1%	1%	1%
Already familiar with information	0	1%	1%	0%	1%	0%
Other	0	1%	1%	4%	6%	5%

*The number of responses is shown where the sample size is less than 20.

The few attendees who replied when asked to provide additional comments and suggestions for improving the trainings most often said they appreciated the fact that the training was provided. The most frequent suggestions for improvements in the January through April trainings were to provide more details on code requirements and provide additional trainings in the future. As noted earlier, the suggestion to provide handouts of the slides used was addressed in early November 2015 (Table 13). Examples of areas where the respondents wanted more details on code requirements include retrofits and renovations, sealing of penetrations for plumbing and HVAC, vapor barriers, and make-up air. The “Other” category includes issues such as the ARS not working properly and the survey questions being unclear.



Table 13. Additional Comments and Suggestions to Improve Trainings
(Percent; multiple response)

General Category	January thru April Trainings			All Trainings 2014 thru 2016
	EBS	HVAC-IAQ	Total	
n*	22	8	30	296
Appreciated the training	48%	2	42%	33%
Spend more time on documentation	13%	1	13%	20%
Provide more detail on code requirements	22%	2	23%	13%
Provide handouts of the slides used	0%	0	0%	11%
Provide additional trainings in the future	9%	1	10%	5%
Provide examples of how to apply code and products to use	4%	0	3%	5%
Improve slide image quality	0%	0	0%	3%
Change focus to 2015 IECC code	0%	1	3%	3%
Extend the training session time	0%	0	0%	2%
Further focus on the stretch code and related changes	0%	1	3%	1%
Provide checklists	0%	0	0%	1%
Focus on training topic	4%	0	3%	0%
Other	27%	1	23%	33%

*The number of responses is shown where the sample size is less than 20.

Training Attendee Data

More than one-third of the January through April training attendees who completed detailed registration forms work as building code officials. Code officials and architects were more likely to attend EBS trainings, while HERS raters were more likely to attend HVAC-IAQ trainings. Table 14 presents more detailed self-descriptions of the trainees' positions. Please note that only 85 of the estimated 144 training attendees completed registration forms providing this information.

Table 14. Training Attendees
(Percent)

Position	January thru April Trainings			All Trainings 2014 thru 2016
	EBS	HVAC-IAQ	Total	
n*	45	40	85	1020
Building code official	47%	28%	38%	52%
Builder (oversees the entire construction of a home or building)	27%	30%	28%	18%
Architect or design engineer	11%	3%	1%	10%
HERS rater or energy efficiency consultant	4%	15%	9%	6%
Building contractor	11%	13%	12%	7%
Equipment	0%	0%	0%	1%
Other	0%	0%	0%	6%

*Does not include training attendees who filled out paper surveys but either did not register for the trainings or did not indicate their occupation when registering.

As in the earlier trainings, the majority of building code officials, builders, and architects trained from January through April 2016 have been in their present positions for at least ten years (Table 15). However, most energy efficiency consultants or HERS raters at the most recent trainings have been at their present positions for five years or less.

Table 15. Years in Present Position for January through April 2016 Trainees
(Percent)

Position	n	Less than 1 year	1 to 5 years	6 to 10 years	11 to 15 years	16 to 20 years	More than 20 years
Building code official	32	0%	16%	13%	19%	22%	31%
Builder (oversees the entire construction of a home or building)	23	0%	4%	17%	56%	0%	22%
Building contractor	8	0	2	2	1	0	3
Architect or design engineer	11	0	2	2	1	0	6
HERS rater or energy efficiency consultant	8	3	3	0	1	0	1

*The number of responses is shown where sample size is less than 20

Residential trainings held from December 2014 through April 2016 used ARS to develop estimates of the proportion of all building permits that are drawn for retrofit projects and, for the retrofit projects, the proportion of building permits that are energy-related. As shown in Table 16, the respondents indicated that an average of just over three-fifths of the permits they drew or were drawn in their jurisdictions were for retrofit projects and three out of five retrofits are energy-related. Building code officials provided similar responses to all trainees.

Table 16. Proportion of Retrofit Building Permits
(Percent)

Percentage of all building permits issued	All trainees		Building code officials only	
	Retrofit portion	Portion of energy-related retrofit permits	Retrofit portion	Portion of energy-related retrofit permits
n	559	529	215	201
None	3%	3%	2%	2%
20%	11%	16%	15%	22%
40%	15%	16%	13%	19%
60%	27%	18%	28%	23%
80%	37%	27%	40%	24%
100%	7%	19%	2%	9%
Mean	61%	61%	59%	55%

The survey respondents work in cities and towns across Massachusetts (they could list up to three municipalities on the survey forms). The January through April trainees work across Massachusetts--Boston, Newton, Natick, and Lexington are listed most frequently due to large numbers of builders and others attending (Table 17).

Table 17. Cities and Towns Represented in the January through April Trainings
(Number of responses; multiple response)

City or Town	Code Officials	Builders and Others	Total	City or Town	Code Officials	Builders and Others	Total
Acton	0	2	2	Cambridge	2	6	8
Amherst	0	7	7	Chelmsford	0	1	1
Andover	1	0	1	Concord	0	3	3
Arlington	0	3	3	Danvers	0	1	1
Ashby	0	1	1	Dedham	3	0	3
Attleboro	0	1	1	Dracut	0	1	1
Bedford	2	1	3	Duxbury	0	5	5
Belchertown	1	0	1	Hudson	0	1	1
Belmont	0	7	7	Hyannis	0	1	1
Beverly	0	2	2	Lakeville	0	1	1
Billerica	0	1	1	Lawrence	0	1	1
Boston	0	18	18	Lenox	0	1	1
Brookline	2	5	7	Leominster	0	1	1
Fitchburg	0	1	1	Lexington	2	10	12
Framingham	0	2	2	Longmeadow	0	2	2
Greenfield	0	4	4	Lowell	3	1	4



City or Town	Code Officials	Builders and Others	Total	City or Town	Code Officials	Builders and Others	Total
Haverhill	0	2	2	Marshfield	0	4	4
Hingham	0	3	3	Maynard	1	0	1
Hopkinton	0	1	1	Medford	0	1	1
Methuen	3	1	4	Melrose	0	2	2
Milton	0	4	4	Peabody	0	1	1
Montague	1	0	1	Pittsfield	0	1	1
Nantucket	0	1	1	Reading	0	1	1
Natick	3	7	10	Revere	1	1	2
Needham	0	4	4	Salem	0	1	1
New Salem	2	0	2	Seekonk	1	0	1
Newburyport	0	1	1	Somerville	0	3	3
Newton	0	11	11	South Hadley	1	0	1
North Adams	0	1	1	Southbridge	0	1	1
North Andover	1	1	2	Southwick	1	0	1
Northampton	0	6	6	Wayland	2	3	5
Norwell	0	2	2	Wendell	1	0	1
Norwood	0	1	1	Wellesley	0	9	9
Orange	0	1	1	Weston	0	4	4
Oxford	0	1	1	Westwood	0	1	1



City or Town	Code Officials	Builders and Others	Total	City or Town	Code Officials	Builders and Others	Total
Springfield	0	6	6	Weymouth	0	3	3
Sturbridge	0	1	1	Williamstown	0	1	1
Sudbury	0	3	3	Wilmington	1	0	1
Tewksbury	0	1	1	Winchester	0	1	1
Walpole	0	1	1	Winthrop	2	0	2
Ware	1	1	2	Worcester	0	2	2
Warwick	1	0	1	Worthington	1	0	1



Unique Attendees—All Trainings

The team calculated the number of unique trainees for all trainings from September 23, 2014 through June 14, 2016 by using trainee enrollment data and completed immediate surveys. As shown in Table 18, residential trainings had 1,068 unique attendees and the commercial trainings had 602 unique attendees; 212 individuals have attended both residential and commercial trainings. More than four out of ten unique attendees have been code officials; the trainings have also had sizable numbers of architects in attendance. Builders, described as those overseeing the entire construction of a home or building, and building contractors responsible for specific aspects of construction, as would be expected, have been much more likely to attend residential trainings. Trainees listed as “other” most often described themselves as engineers, facilities managers, or consultants to the PAs. This table will be updated for each memo, residential and commercial, provided on the immediate training surveys.

Table 18. Numbers of Unique Training Attendees
(Number of attendees)

Position	All Residential Trainings	All Commercial Trainings	All Trainings—Both Res and Com
Building code official	513	270	620
Builder (oversees the entire construction of a home or building)	151	24	174
Architect or design engineer	113	104	201
Building contractor	92	21	111
HERS rater or energy efficiency consultant	55	46	98
Equipment supplier	18	29	42
Other	78	81	152
Position not known*	60	45	101
Total unique training attendees	1068	602	1458

*Includes individuals who did not indicate their position on the registration form and a small number of individuals who attended the trainings (and filled out the immediate paper surveys), but did not register.