



# MASSACHUSETTS PRESCHOOL EXPANSION GRANT (PEG) Cost Study Report



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This report describes the cost of implementing the Massachusetts Preschool Expansion Grant (PEG) program which is funded by a four-year federal grant to the Massachusetts Department of Early Education and Care. The PEG model is built around a collaborative public-private delivery system. PEG requires shared governance between local school districts (referred to as LEAs in this report) and EEC-licensed programs (referred to as ELPs), with classrooms run by the community-based ELPs. The 48 PEG classrooms provide free prekindergarten for low income four-year-olds (i.e., age four as of September 1 of the incoming school year) who will be eligible for kindergarten in the upcoming fall and who, with some exceptions, have not yet attended a formal child care program (licensed center-based or family child care).

The PEG model is intended to achieve a high level of quality in instructional and emotional supportiveness, classroom organization, and learning resources, while also being responsive to local needs. Each PEG community was encouraged to design a program that adhered to certain quality requirements, with a goal of ensuring consistently high quality learning environments while also allowing for local variation (see Exhibit 1).

#### **Exhibit 1. PEG Model Quality Elements**

1.	A collaborative local governance structure designed to oversee implementation and work on systems coordination for all children in the community;
2.	Full-day, full-year programming (at least 8 hours/day, 12 months/year);
3.	A maximum class size of 20;
4.	A maximum child-teacher ratio of 10:1;
5.	A curriculum/a aligned with the MA Preschool Standards and Guidelines (curriculum/a may vary by grantee);
6.	The use of Teaching Strategies Gold® as a formative assessment tool;
7.	One educator in each classroom with a bachelor's degree in a relevant field;
8.	Salaries for lead educators commensurate with comparable positions in public schools within the respective community;
9.	Joint professional development training and coaching for teaching staff, and other supports for planning and implementation of curriculum, in collaboration with the LEA;
10.	Family engagement activities, including support for kindergarten transition and resources about child development;
11.	Comprehensive services including services addressing health, mental health, and behavioral needs for all families;
12.	Inclusion of students receiving special education support; and
13.	Efforts to build linkages with services for children from birth to age 3 as well as connections with elementary schools.

Source: Massachusetts Department of Early Education and Care

By the end of the grant period (2018–19), PEG centers are also expected to attain the highest rating (Level 4) in the Massachusetts Quality Rating and Improvement System (QRIS) or Level 3 and National Association for the Education of Young Children (NAEYC) accreditation.

This cost study focuses on the costs of implementing PEG overall, by community or LEA, and within community by ELP. It then examines the relationships between the cost of PEG and observed classroom quality and impacts on child outcomes (using the effects generated by the PEG impact study).

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Costs were estimated using (a) expenditure data from the LEAs in the five PEG communities and (b) data from the PEG ELP PEG expenditure reports.<sup>1</sup> All data were from the second year of PEG implementation or 2016-17.

The average total cost per PEG child and per PEG classroom were calculated<sup>2</sup>, and the average cost was also categorized into five components. Details about how individual line items from expenditure reports were categorized into components, as well as a description of the process of calculating costs, are provided in the Appendix.

One of the five PEG communities (Boston) had a braided funding model that combined PEG resources, subsidy funds, and sometimes Head Start funds to support implementation. Since the braided funding model is not comparable to the model used by the other four communities, the bulk of the analyses in this report focus just on the 33 classrooms in the other four communities (Holyoke, Lawrence, Lowell, and Springfield).

Key child-level findings across the 33 classrooms (557 slots) in the communities that did not braid PEG funds with other resources are as follows (also see Exhibit 2):

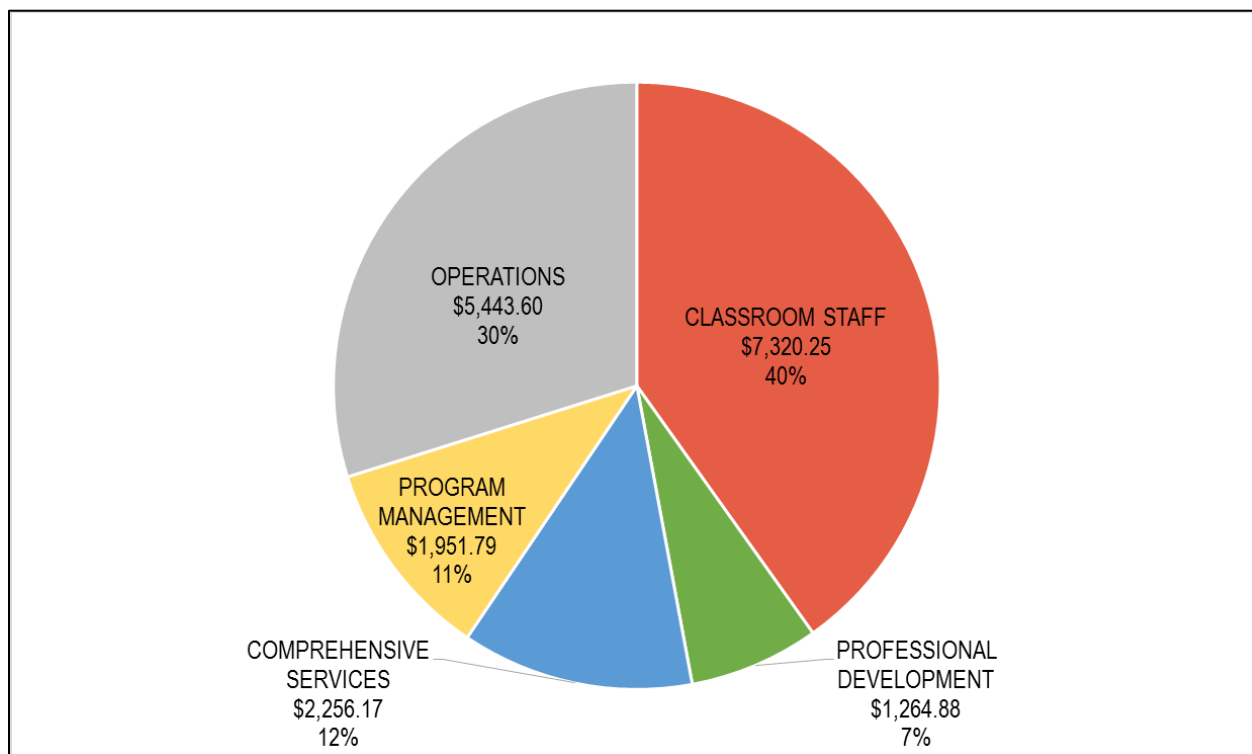
- The average per-child cost was \$18,237.
- The per-child costs were distributed across components as indicated below (see Exhibit 1):
  - 40% for classroom staff;
  - 7% for professional development;
  - 12% for family comprehensive services and engagement for children and families;
  - 11% for program management; and
  - 30% for operational expenses.
- The per-child cost was fairly similar across communities, and ranged from \$17,034 to \$20,919.
- There was substantial between-ELP variation in total per-child cost, ranging from \$15,492 to \$21,775.

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<sup>1</sup> State expenditures are included in the Appendix, and are not factored into total per-child expenditures in the main body of this report, similar to many program cost studies that do not factor in the cost of higher administrative contributions/federal infrastructure.

<sup>2</sup> Per-classroom costs are only presented for the statewide summary and are not adjusted for differences in numbers of children and teachers per PEG classroom.

**Exhibit 2. Average 2016-17 Per-Child PEG Cost by PEG Component (LEA + ELP Contributions)**



Note. n=33 PEG classrooms

There are several key issues to keep in mind when considering the information in this report.

- It should be noted that LEAs and ELPs did not consistently categorize expenditures and provided varying levels of detail to EEC and the study team. The study team conducted follow-up interviews with LEAs and ELPs to gather additional detail about expenditures and tried to reconcile inconsistencies as much as possible.
- This analysis is a cost *expenditure* analysis, versus a strict cost analysis, as it only looks at reported expenditures from the PEG grant rather than any other sources of funding that supported PEG children and families.
- In-kind contributions were not documented systematically. Through individual conversations with LEA and ELP staff, a description of the types of in-kind funds each site used to support PEG classrooms during the 2016-17 year is provided after each community's cost summary. Generally, these contributions included staff time, usually at the district level, which was used for coordinating and attending PEG meetings and providing grant support, as well as contributions toward physical space, training, and general program operations.

## PEG Expenditures Statewide

Exhibit 3 provides the average per-child PEG costs overall and by component across the 33 PEG classrooms without braided funding. The bulk of expenditures were related to either staffing the classroom (40% of the average total cost) or operational costs (30% of the average total cost). The average per-classroom cost across these 33 classrooms was \$307,813. The operational costs are detailed further in Exhibit 4 (and defined in the Appendix), which shows average per-child expenditures per operations subcategory and the percentage for each subcategory of the total operations cost.

**Exhibit 3. Average 2016-17 PEG Expenditures by Component (LEA + ELP Contributions)**

Component	Average Cost per Child (% Total Cost)	Average Cost per Classroom (% Total Cost)
Classroom Staff	\$7,320.25 (40%)	\$123,557.02 (40%)
Professional Development	\$1,264.88 (7%)	\$21,349.61 (7%)
Comprehensive Services	\$2,256.17 (12%)	\$38,081.44 (12%)
Program Management	\$1,951.79 (11%)	\$32,943.84 (11%)
Operations	\$5,443.60 (30%)	\$91,881.29 (30%)
<b>Total</b>	<b>\$18,236.69</b>	<b>\$307,813.19</b>

Note. n=33 PEG classrooms, 557 child slots

The largest expenditure subcategories in Operations were facilities costs and indirect costs.

**Exhibit 4. Average 2016-17 PEG Expenditures by Operations Subcategory (LEA + ELP Contributions)**

Operations Subcategory	Average Cost per Child (% Operations Cost)	Average Cost per Classroom (% Operations Cost)
Executive Staff	\$323.36 (4%)	\$5,457.97 (6%)
Office Staff	\$640.97 (9%)	\$10,818.77 (12%)
Facilities	\$1,708.80 (23%)	\$28,842.46 (31%)
Equipment and Supplies	\$1,025.96 (14%)	\$17,316.90 (19%)
Special Events	\$70.33 (1%)	\$1,187.13 (1%)
Student Transportation	\$179.35 (2%)	\$3,027.14 (3%)
Indirect Costs	\$1,417.02 (19%)	\$23,917.58 (26%)
Miscellaneous	\$77.81 (1%)	\$1,313.34 (1%)
<b>Total</b>	<b>\$5,443.60</b>	<b>\$91,881.29</b>

Note. n=33 PEG classrooms, 557 child slots



## PEG Expenditures by Community and ELP

Exhibit 4 provides the average per-child 2016-17 PEG costs across the 33 PEG classrooms without braided funding, overall and by component, for each of the four communities (Holyoke, Lawrence, Lowell, and Springfield). Total average per-child costs were fairly similar across communities and ranged from \$17,034 in Lawrence to \$20,919 in Lowell (see Exhibit 5).

There was more variation across communities in the percentages of their total costs allocated to the different component categories. For example, Lowell spent a much smaller percentage of their costs on staffing the classroom than the other three communities, and instead spent more on operations costs. And Lawrence spent a relatively small percentage of their total budget on professional development. A table showing a break-down of costs by community in the operations category is provided in the Appendix.

**Exhibit 5. Average 2016-17 Cost per PEG Child by Community (LEA + ELP Contributions)**

Component	Average Cost per Child (% Total Cost)			
	Holyoke (n=76 slots)	Lawrence (n=130 slots)	Lowell (n=156 slots)	Springfield (n=195 slots)
Classroom Staff	\$7,165.24 (41%)	\$7,690.49 (45%)	\$7,327.41 (35%)	\$7,128.12 (41%)
Professional Development	\$1,657.34 (10%)	\$762.69 (4%)	\$1,516.96 (7%)	\$1,245.05 (7%)
Comprehensive Services	\$2,922.71 (17%)	\$1,562.73 (9%)	\$2,356.72 (11%)	\$2,378.24 (14%)
Program Leadership	\$1,921.92 (11%)	\$2,243.97 (13%)	\$1,729.91 (8%)	\$1,946.15 (11%)
Operations	\$3,637.54 (21%)	\$4,773.48 (28%)	\$7,987.59 (38%)	\$4,559.04 (26%)
<b>Total</b>	<b>\$17,304.74</b>	<b>\$17,033.36</b>	<b>\$20,918.60</b>	<b>\$17,256.60</b>

Note. Total n=33 PEG classrooms, 557 child slots

## LEA Contributions

There were substantial differences in the amount of PEG expenditures in the LEA reports in each community, ranging from an average of \$943 per-child in Lawrence to an average of \$2,902 per-child in Holyoke. Exhibit 6 shows these LEA per-child expenditures by category, including a detailed break-down of operational costs, for the four communities without braided PEG funding. The Lawrence LEA costs were primarily allocated to program management, a much higher proportion than what other communities allocated to that category.

## Exhibit 6. Average 2016-17 PEG LEA Expenditures per PEG Child

Component	Average Cost per Child (% Total Cost)			
	Holyoke (n=76 slots)	Lawrence (n=130 slots)	Lowell (n=156 slots)	Springfield (n=195 slots)
Classroom Staff	\$0 --	\$0 --	\$0 --	\$0 --
Professional Development	\$670.43 (23%)	\$18.77 (2%)	\$849.21 (35%)	\$660.12 (30%)
Comprehensive Services	\$854.79 (29%)	\$15.83 (2%)	\$426.71 (18%)	\$447.63 (20%)
Program Management	\$351.66 (12%)	\$854.19 (91%)	\$462.32 (19%)	\$453.54 (21%)
Operations	\$1,025.31 (35%)	\$54.13 (6%)	\$687.38 (28%)	\$622.74 (29%)
Executive Staff	\$263.62	\$0.00	\$0.00	\$404.58
Office Staff	\$215.94	\$0.00	\$126.92	\$109.57
Facilities	\$0.00	\$0.00	\$0.00	\$2.18
Equipment and Supplies	\$1.67	\$22.67	\$35.26	\$98.68
Special Events	\$0.00	\$0.00	\$0.00	\$0.00
Student Transportation	\$0.00	\$0.00	\$0.00	\$0.00
Indirect Costs	\$544.08	\$0.00	\$525.21	\$0.00
Miscellaneous	\$0.00	\$31.46	\$0.00	\$7.73
<b>Total</b>	<b>\$2,902.19</b>	<b>\$942.92</b>	<b>\$2,425.62</b>	<b>\$2,184.03</b>

Note. n=33 PEG classrooms, 557 child slots

## Community Details

This next section provides community and ELP level average costs per child by component along with information about in-kind contributions. As described above, overall costs across communities were fairly similar. There were larger differences between ELPs, both in absolute numbers and in percentage of costs allocated to different components, both within and across communities.

### Boston

As described earlier, the funding model in Boston was more complex than in the other four communities that implemented PEG classrooms. Boston PEG classrooms blended PEG funding with funding from other sources including subsidy funds and Head Start. As such, it is difficult to understand the true cost of running the PEG program in Boston from the PEG expenditure reports alone.

Exhibit 7 shows the average cost in Boston for the 15 classrooms operated by ELPs in this community, as described in the 2016-17 PEG expenditure reports. The total per-child average cost was slightly lower than the other four communities. For Boston classrooms only, there is an additional expenditure category called 'Funds from Other Sources' to reflect income from sources other than PEG. These funds came primarily from child care subsidies but also included, in some cases, private parent fees and the cost of meals for children that were paid for by the Department of Nutrition.

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**Exhibit 7. Average 2016-17 Cost in Boston PEG (LEA + ELP Contributions)**

Component	Average Cost per Child (% Total Cost)
Classroom Staff	\$5,267.81 (27%)
Professional Development	\$1,578.00 (8%)
Comprehensive Services	\$1,496.05 (8%)
Program Management	\$1,865.77 (9%)
Funds from Other Sources	\$6,406.61 (32%)
Operations	\$3,202.97 (16%)
<b>Total</b>	<b>\$19,817.21</b>

Note. n=15 PEG classrooms, 280 child slots

Per-child costs ranged substantially across Boston PEG ELPs (from \$15,018 to \$23,312). No one category was responsible for these differences; costs per category varied rather widely from one ELP to the next, as did the percentage of each ELP's total cost allocated to different components.

*Boston In-Kind Contribution Description.* The LEA reported no in-kind contributions, either in their expenditure report or staff interviews. As in most of the communities, the majority of in-kind contributions fell into 3 main categories: administrative staff time, child meals and snacks, and facility costs. In Boston, these contributions included purchased services (fiscal mobility, fitness programs, etc.) for children and families, transportation, field trips, administrative help to run PEG classrooms and help with family engagement, the purchase of child meals and snacks, dental and vision programs in some ELPs, mental health consultants in some ELPs, indirect costs that cannot be charged to the PEG grant, rent and utilities for some ELPs, etc.). These contributions were particularly salient for programs that are jointly operated with Head Start or the YMCA; both of those agencies provided and/or required child/family access to a number of outside services, and only a portion of the cost of those services was typically charged to PEG. Additionally, a significant amount of funding, labeled as 'Funds from Other Sources' here but often going towards Classroom Staff costs, in the Boston PEG classrooms came from non-PEG sources.

### **Holyoke**

Costs were fairly similar across the programs, though Valley Opportunity Council (VOC) spent slightly more per-child than Holyoke Chicopee Springfield Head Start Holyoke (HCS), primarily because of higher classroom staffing costs (both overall and as a percentage of the total).

*Holyoke In-Kind Contribution Description.* Holyoke reported no in-kind contributions in their expenditure reports but explained such contributions in interviews. As is the case in most communities, the majority of in-kind contributions fell into 3 main categories including: administrative staff time, child meals and snacks, and facility costs. In Holyoke, these contributions included small amounts of family engagement staff time that benefited both PEG and non-PEG classrooms, all rent costs except for one classroom along with all utility costs except for custodians and maintenance, all child meals and snacks for VOC, and the special education team at the district that assisted in student intervention and support.



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## Lawrence

Total per-child costs were very similar between the two ELPs, although the Greater Lawrence Community Action Council (GLCAC) spent much more on comprehensive services than The Community Group (TCG), and The Community Group spent more on staffing the classroom, on professional development, and on program management (but less on operations costs).

*Lawrence In-Kind Contribution Description.* Lawrence reported no in-kind contributions in their expenditure reports but explained such contributions in interviews. In Lawrence, these contributions included substantial staff time from the public school staff particularly from the grants department for reviewing/approving invoices, releasing funds, etc. Additionally, public school staff spent a minimum of an hour of time for each LEAP child to complete registration paperwork. The family resource center nurse contributed approximately 20 hours of time that was split between the two programs. There was also staff time from the registration manager, outreach efforts from various staff members, website updates, etc. that were all part of in-kind contributions.

## Lowell

Though total costs were similar between the two ELPs, the percent of expenditures allocated to all categories except Classroom Staff were fairly different. For example, 16% of the cost per-child at Little Sprouts went towards supporting comprehensive services for children and families, while only 7% of Community Teamwork's (CTI) expenditures were allocated to that category. Additionally, CTI reported 48% of their costs allocated to operations compared to only 27% of Little Sprouts' expenditures. It should be noted that ELPs in Lowell intentionally shared costs; CTI covered child transportation and Little Sprouts paid for the majority of professional development for the community.

*Lowell In-Kind Contribution Description.* Lowell reported no in-kind contributions in their expenditure reports though explained such contributions in interviews. Lowell LEA staff reported through interviews that there were three sources of in-kind contributions included in the Operations category in the above exhibits. These sources included staff time for accounting records, PEG budget management, and human resource services. In addition to those three sources, there was additional in-kind staff time related to training for administrators and family service staff from the Head Start program, a discounted trauma services contracted rate, and a large amount of services at multiple levels including additional fiscal management. One ELP only partially charged rent and facilities costs to the PEG grant. There is staff recruitment costs for new staff at Little Sprouts, public school staff that worked to enroll families, nursing staff to review student records prior to placement, a systems management administrator, a large number of books donated as part of the Higher Order Teaching Grant, etc.

## Springfield

Square One spent considerably less per-child than the other two programs (Holyoke Chicopee Springfield Head Start, or HCS, and YMCA of Greater Springfield), despite allocating a higher overall and percentage-based cost to professional development and to program management (and Square One had lower operations costs than the other two programs). The YMCA had higher operations cost than the other two programs, likely due in part to the family YMCA memberships that were provided for every family that enrolled in PEG.

*Springfield In-Kind Contribution Description.* Springfield reported no in-kind contributions in their expenditure reports though explained such contributions in interviews. In Springfield, administrative and office staff dedicated more time to the PEG classrooms than they charged to the PEG grant (directors, the

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building supervisor and secretary, parent engagement facility staff, IT staff, early education supervisor time assessing children and meeting with partners around referrals, family parent staff who organize family events, and grants department staff). Some materials at the common building were not charged to the grant, as well as the use of the copy machine there, the cost of paper, etc. Similar to other communities, Springfield was limited in the amount of indirect costs that they could charge to the grant, so some of the indirect costs became in-kind contributions. There were also substantial staff in-kind time dedicated to trying to plan for the sustainability of PEG. Finally, some costs of a physical education/activity program (around \$20,000) came from another grant that also paid for a nutritional curriculum that provided PEG families with the opportunity to attend family engagement events.

## Relationship of PEG Expenditures to Classroom Quality and Impacts on Children's Skills

In addition to the calculation of the cost of PEG per child, the study team examined the relationship between cost expenditures and classroom quality and between cost and PEG's impact on children's skills. It is important to note that any analyses regarding the relationship between program cost and classroom quality and between program cost and impacts are exploratory and not causal in nature. Further, analyses in this section included all five PEG communities (48 classrooms; 17 ELPs).

### Relationship of PEG Costs and Quality

To address the question of whether PEG expenditures were related to classroom instructional quality, the study team examined the correlation between average ELP per-child cost and average quality scores using data collected by the study team on each PEG classroom with the CLASS™ observation measure (Classroom Assessment Scoring System™; Pianta, La Paro, & Hamre, 2008). Exhibit 13 shows a scatterplot of the relationship between quality (total CLASS score in 2016-17) and per-child expenditures. Generally, as the per-child cost increases, so does observed quality.

**Exhibit 13. Relationship between Per-Child Cost (LEA + ELP Contributions) and Total CLASS Scores in Year 2**

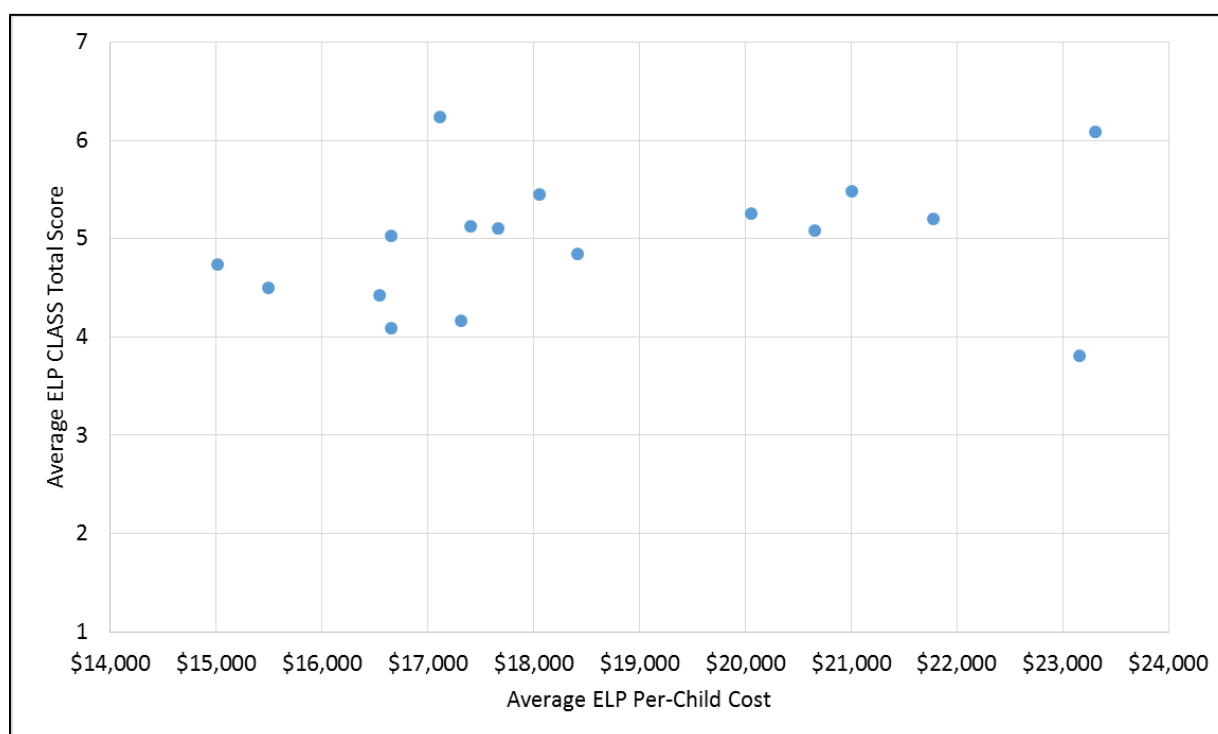


Exhibit 14 shows zero-order correlations between the total CLASS score and scores on each CLASS domain from the 2016-17 and 2017-18 years with average per-child cost.

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**Exhibit 14. Correlations between Per-Child Cost (LEA + ELP Contributions) and Observed Classroom Quality (All 17 ELPs)**

Quality Variable	Quality in 2016-17	Quality in 2017-18
Total CLASS Score	.23	.43
CLASS Instructional Support Domain	.31	.45
CLASS Emotional Support Domain	.14	.49*
CLASS Classroom Organization Domain	.11	.18

\* $p < .05$ , \*\* $p < .01$

There was one obviously outlier in the data (high cost-per-child but lower quality). When that outlier was removed, the correlations between 2016-17 quality and cost increased to .56 (total CLASS score,  $p < .05$ ), .45 (Instructional Support), .54 (Emotional Support,  $p < .05$ ), and .56 (Classroom Organization,  $p < .05$ ).

The study team also looked at the relationship between average ELP per-child cost in terms of the percentage of total budgets allocated to various components and classroom quality outcomes. For example, rather than consider the number of dollars spent on professional development, the study team considered the percentage of total dollars spent that were spent on professional development. To examine the relationship between costs and classroom quality in this more nuanced way, the study team conducted linear regressions predicting classroom quality from four percentages (costs allocated to classroom staffing, to professional development, to comprehensive services, and to program management). Though there were occasional statistically significant results in this batch of analyses, there was nothing to suggest an interesting relationship or pattern of relationships between cost allocation and classroom quality.

The study team also collapsed some of the allocation categories to look at the relationship of cost allocation for the percent allocated to classroom staff and professional development combined, the percent allocated to comprehensive services and program management combined, and observed classroom quality. Though there were very few statistically significant results, the findings did suggest that, generally, ELP's that had higher proportions of their total expenditures allocated to the combination of comprehensive services and program management and lower average classroom quality. It is important to note here that a relatively liberal p-value was used to determine statistical significance ( $p < .10$ ); further, these relationships do not imply causality but rather relationships of interest that might be explained by any number of factors.

### Relationship of Cost and Impact

To address the question of whether PEG costs are related to average program impact on children's achievement, the study team examined the correlation between average ELP per-child cost and ELP-level impact from the PEG impact evaluation. The relationship between cost and impact (ELP-level effect sizes were averaged across the three key academic skill areas: early literacy, early math, and vocabulary) was virtually zero (correlation = -.14). There were two outliers that may have skewed the calculated correlation. When outliers were adjusted by recoding it so that it was less extreme,<sup>3</sup> the correlation does not increase in strength. In general, for both the unadjusted or adjusted data, the study team did not find evidence of a

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<sup>3</sup> To adjust for outliers, the study team first rank-ordered the variable of interest. Then, the difference between the two non-outlying values that immediately preceded the outlier in rank order was calculated. The outlying value was recalculated as the next non-outlying value *plus* the difference in the nearest two non-outlying values. This results in the original outlying value still remaining as the most extreme value in the array but only less extreme so as not to skew the analysis. This type of variable transformation is a common technique in statistical analysis.

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pattern in the relationship between PEG per-child cost and PEG impact on children's skills *averaged across content areas*.

The study team further examined the relationship between cost and impact by calculating the correlation for each academic construct. Exhibit 15 shows the correlations of cost and impact for the three key early academic skill areas (Early Literacy was assessed with the Woodcock-Johnson III Tests of Cognitive Abilities Letter-Word Identification Subtest by Woodcock, McGrew, & Mather, 2001; Early Math was assessed with the Woodcock-Johnson III Tests of Cognitive Abilities Applied Problems Subtest; Vocabulary was assessed with the Peabody Picture Vocabulary Test Fourth Edition by Dunn & Dunn, 2007). ELPs that spent more on PEG children tended to also have a somewhat larger impact on children's literacy skills (not significantly so), though this relationship does not imply that costs *led to the increase* in impact.

**Exhibit 15. Correlations between Average Per-Child Cost (LEA + ELP Contributions) and Impact on Child Achievement (All 17 ELPs)**

Construct	Correlation with Impact
Early Literacy	.21
Early Math	-.30
Vocabulary	-.18

Finally, the study team examined the relationship between percentages of expenditures per component and PEG impact on children's skills. Similar to the method used to examine the relationship between cost and classroom quality, the study team conducted regressions predicting impacts on children's achievement from the four key cost percentages. ELP's that allocated a higher percentage of their total expenditures to staffing the classrooms did tend to have larger impacts on children's early literacy skills.

It is difficult to interpret these relationships between PEG per-child expenditures and impacts on children's early academic skills. Though some correlations appear strong, there does not appear to be an overarching pattern of relationships that suggest a truly systematic picture. This is particular difficult given the variation in impacts across ELPs, even within a community. In sum, per-child costs differed, and impacts on children differed. The study team did not find evidence of a strong relationship, and certainly not a causal one as this study was not designed to answer causal questions about cost and impact.

The average overall per-child cost in Massachusetts PEG classrooms, including those in Boston, was \$18,765. The average impact of PEG on children's literacy scores (the largest effect found in the impact study) was .92 standard deviation units, or an average of 14 standard score points. This cost-effectiveness ratio (or, more accurately, *expenditure-effectiveness* ratio as discussed earlier in this report) is approximately 1340:1, which equates to an increase of one standard score point for every \$1,340 spent per-child. Perhaps a more meaningful way to look at this ratio is to consider the achievement gap at kindergarten entry related to income. The gap in literacy achievement between disadvantaged and better-advantaged children at kindergarten entry is approximately 15 standard score points<sup>4</sup>, only slightly more than the average PEG effect on literacy skills in the impact study. The results of this study show that PEG is essentially closing this gap for the average five-year-old child at a cost of \$18,765.

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<sup>4</sup> Garcia, E. Economic Policy Institute. (2015) *Inequalities at the Starting Gate: Cognitive and Noncognitive Skills Gaps between 2010-11 Kindergarten Classmates*. Washington, D.C.

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## Appendix

### Process of Categorizing Expenditure Report Line Items

#### *Sources*

The general approach to this cost analysis was a top-down costing estimation. All data were from 2016-17. Three sources were used to calculate the per-classroom cost: LEA expenditures, ELP expenditures, and follow-up telephone and email interviews with LEA and ELP staff responsible for fiscal oversight. Additional contributions from the Massachusetts Department of Early Education and Care (EEC) expenditure report were also considered but kept separate.

#### *Calculation Process*

To begin this process, the study team collected all necessary expenditure reports. Then, each line item of each LEA, ELP, and EEC expenditure report was categorized by the study team according to components of the PEG model (classroom staff, professional development, comprehensive services and engagement for children and families, and program management) and a component that was not specific to PEG implementation but was necessary for running the program (i.e., operations costs). A general description of the types of line items grouped into each category is provided below. Italicized subheadings represent those overall categories from the state-provided budget/expenditure shell.

- **Classroom Staff**
  - *Personnel & Fringe:* Lead and assistant teachers and paraprofessionals/floaters that serve as third/fourth teachers in the classroom
- **Professional Development**
  - *Personnel & Fringe:* Coaches; substitute teachers assumed to cover staff leave for training purposes; Classroom Developers
  - *Travel:* Staff reimbursement for travel to conferences/supervision meetings
  - *Supplies:* Coaching resource materials
  - *Contractual:* Subcontracts for coaches and mentors; staff training; Continuing education courses
  - *Training Stipends:* Training stipends; Tuition reimbursement for approved courses
  - *Other:* Conference/workshop/staff training costs
- **Comprehensive Services and Engagement for Children and Families**
  - *Personnel & Fringe:* Case managers; enrollment/engagement specialists; volunteer coordinators; nurses; nutrition coordinators; cooks; meal deliverers, family coaches; family advocates; intervention teams; community managers; music therapists; special education therapists; priority population specialists
  - *Travel:* transportation costs for families to attend events/obtain services; travel costs for home visits
  - *Supplies:* outreach and recruitment supplies; training resources for working with families; parent resources; therapeutic supplies
  - *Contractual:* Mental health consultants; music specialists; child health contractors; special education contractors; translation services; swimming lessons; family YMCA memberships
  - *Other:* food for parents and children; advertising costs; family engagement events; kindergarten backpacks for children
- **Program Management**
  - *Personnel and Fringe:* EG Program Managers and Project Coordinators; Site Directors



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- **Operations (described in the next step).**

Any in-kind costs listed in expenditure reports or discussed in interviews with PEG staff were not included in the above component categories. In Boston, some of these costs were included in an additional ‘Funds from Other Sources’ category, but in the other four communities, lack of documentation prohibited including specific expenditure amounts in this category.

Once all line items were categorized, the study team then further categorized the expenditures in the rather large and various operations category according to their purpose. A general description of the types of line items grouped into each sub-category is provided below.

- *Executive Staff:* Executive Directors; Directors and Assistant Directors of Early Childhood Education and Program Development.
- *Office Staff:* Management staff; financial officers; human resources staff; IT technicians; custodial staff; office managers; accountants; data managers.
- *Facilities:* rent; storage costs; utilities; trash and landscaping fees; insurance; telephones; licenses/permits/fees; legal and audit fees; pest control; internet access costs.
- *Equipment and Supplies:* cellular phones; computer software, hardware, and licenses; technology repair and maintenance; furniture; instructional materials; office supplies; screening/assessment supplies; playground equipment; medical supplies; uniforms.
- *Special Events:* Special student trips and events for curriculum enrichment.
- *Student Transportation:* student transportation costs (not applicable in all communities).
- *Indirect Costs:* any reported indirect costs charged to the PEG grant.
- *Other:* any other reported administrator travel costs and gas expenses; data processing and professional fees; hiring materials.

Individual line item amounts were collapsed across reporting periods and summed within category for each ELP. Category sums for each individual ELP were summed with the LEA amounts from those same categories. Finally, the per-ELP sums in each category were divided by the number of PEG slots to yield an average *per child* expenditure for each ELP.

### **State Expenditures**

EEC spent additional resources on staffing and the evaluation at the state level and distributed additional funds to each PEG community to help support the evaluation. Those expenditures are not included in the per-child costs described in the main body of this report. Exhibit A.1 shows the break-down of the EEC costs per expenditure component.

### Exhibit A.1. Average 2016-17 Cost per PEG Child by Component from EEC Contributions

Component	Average Cost per Child (% Total Cost)
Classroom Staff	\$0 --
Professional Development	\$74.70 (13%)
Comprehensive Services	\$0 --
Program Management	\$391.78 (68%)
Operations	\$109.48 (19%)
Indirect Costs	\$96.60
Miscellaneous	\$12.88
<b>Total</b>	<b>\$575.96</b>

Note. n=48 PEG classrooms, 837 child slots

### Operation Subcategory Costs by Community and ELP

Exhibit A.2 shows the average per-child cost in the Operations category broken down by sub-category for each PEG community.

### Exhibit A.2. Average 2016-17 Cost per PEG Child by Operations Category by Community (LEA + ELP Contributions)

Operations Subcategory	Average Cost per Child (% Operations Cost)			
	Holyoke (n=76 slots)	Lawrence (n=130 slots)	Lowell (n=156 slots)	Springfield (n=195 slots)
Executive Staff	\$342.66 (9%)	\$43.24 (1%)	\$21.02 (0%)	\$744.46 (16%)
Office Staff	\$799.91 (22%)	\$693.61 (15%)	\$564.33 (7%)	\$605.24 (13%)
Facilities	\$331.10 (9%)	\$1,188.59 (25%)	\$2,885.59 (36%)	\$1,651.12 (36%)
Equipment and Supplies	\$804.31 (22%)	\$969.98 (20%)	\$1,776.31 (22%)	\$549.38 (12%)
Special Events	\$10.60 (0%)	\$36.59 (1%)	\$59.78 (1%)	\$124.55 (3%)
Student Transportation	\$0 --	\$267.62 (6%)	\$417.34 (5%)	\$0 --
Indirect Costs	\$1,106.44 (30%)	\$1,535.05 (32%)	\$2,193.87 (27%)	\$837.90 (18%)
Miscellaneous	\$242.52 (7%)	\$38.80 (1%)	\$69.35 (1%)	\$46.39 (1%)
<b>Total</b>	<b>\$3,637.54</b>	<b>\$4,773.48</b>	<b>\$7,987.59</b>	<b>\$4,559.04</b>

Note. n=33 PEG classrooms, 557 child slots