

A business partnership for early childhood  
and economic success



# Strengthening Pennsylvania Businesses through Investments in Pre-Kindergarten

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How Investments in Early Learning Increase Sales  
from Local Businesses, Create Jobs  
and Grow the Economy

## Acknowledgements

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## Who We Are

ReadyNation/AMERICA'S EDGE is the nation's preeminent business leader organization working to strengthen business through better policies for children and youth.

We educate policymakers and the public about effective investments that will help businesses compete in today's global marketplace, build a foundation for lasting economic security, and help children get on the right track to succeed in school and in life.

# Executive Summary

## How Early Learning Investments Can Help Expand Pennsylvania's Economy

One of the keys to sustained economic growth in Pennsylvania is to generate additional sales of local goods and services, while also creating new jobs. That is why the Pre-K for PA campaign asked researchers from ReadyNation/AMERICA's EDGE to model the impact of significant expansion of Pennsylvania's high-quality pre-k system and its potential impact on the economy of the state and its major economic regions. This report documents that investments in early learning provide a significant, immediate economic boost for local businesses and help build stronger communities over the long term.

ReadyNation/AMERICA's EDGE estimates that significant expansion of access to high quality Pre-K for all 3- and 4-year olds in Pennsylvania has the potential to generate between \$1.2 and \$1.8 billion dollars in sales of goods and services for Pennsylvania businesses and create thousands of jobs in the state. In fact, investments in high quality early learning generate more new spending for local businesses than investments in seven other major economic sectors. For every \$1 invested in pre-k in Pennsylvania, an additional 79 cents are generated for a total of \$1.79 in new spending in the state. This strong economic boost for local businesses is higher than investments in other major sectors such as retail trade, wholesale trade, services and manufacturing.

Using the economic multipliers generated by the IMPLAN economic model, the report estimated the potential economic benefits of Pennsylvania fully funding its existing Pre-K Counts program. In this scenario, all disadvantaged Pennsylvania children ages 3 and 4 would have access to high-quality pre-k. Through an investment of nearly \$700 million, it is estimated that over 88,000 children from families earning less than 300% of the federal poverty level would enroll in high quality pre-k and that the investment would also generate an additional \$550 million in total new economic activity in Pennsylvania businesses. And nearly all of these dollars generated in Pennsylvania would stay in Pennsylvania – helping local businesses prosper while also creating more than 19,000 new jobs, including 3,800 jobs outside the early learning sector.

The report also models a scenario to expand access to all children regardless of income. This would require an estimated additional public investment of \$326 million to enroll another 80,000 children, and would support an additional \$255 million in spending and 8,900 jobs, including more than 1,700 outside the early learning sector.

But the value of the investment goes beyond the direct and indirect contributions shown by the model. Yet another strategic reason for this investment is that access to quality early education will increase the ability of Pennsylvania businesses to attract skilled employees. Quality programs for our youngest children are needed for the same reasons communities strive to have a strong K-12 education system to attract skilled workers and new businesses. Pennsylvania businesses need the right resources to attract and retain the best workers. One resource that can help communities attract the best employees is the availability of quality Pre-K for their children.

Finally, such an investment will establish a foundation for sustained economic growth because quality early learning is key to ensuring that future employees have the skills Pennsylvania businesses need in a highly competitive global market. Sixty-two percent of the job openings in Pennsylvania in the current decade require post-secondary education. To remain competitive in a global marketplace, businesses also need communicators, collaborators and critical thinkers. Research confirms that quality early learning is the crucial first step in the development of those skills. And research shows that the long-term return on investment is impressive: Studies of high-quality early education programs for at-risk children have shown that quality programs average \$22,000 in net economic benefits (benefits minus costs) for each child served.

**THE BOTTOM LINE:** With limited funds available to help businesses and our economy stay on track, few investments make as much sense for Pennsylvania businesses' balance sheets as do investments in high-quality early education.

# Strengthening Pennsylvania Businesses through Investments in Pre-Kindergarten

## IMMEDIATE SHORT-TERM ECONOMIC GAINS

### Critical Issues for Pennsylvania Businesses

As our economy continues to strengthen, many businesses are experiencing a short supply of employees with 21st century skills, in large part because high school and college graduates lack the knowledge and abilities businesses need.<sup>1</sup> Consider these facts. In Pennsylvania:

- 16 percent of high school students do not graduate on time;<sup>2</sup>
- 59 percent of eighth graders are below grade level in math;<sup>3</sup> and
- 60 percent of fourth graders read below grade level.<sup>4</sup>

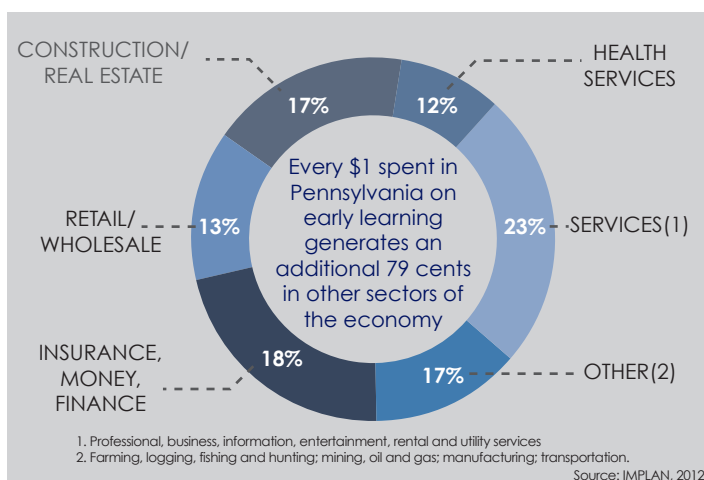
Nationally, far too many children do not have the basic skills needed to enter kindergarten, such as counting to ten and recognizing letters in the alphabet.

High quality pre-k has been show to improve high school graduation rates.<sup>5</sup> Each year, dropping out costs the United States dearly in lost productivity. In fact, high school dropouts are so much less productive than high school graduates that each class of dropouts nationwide will make \$337 billion less over their lifetime than they would have as graduates.<sup>6</sup> That loss of earnings translates into less spending power, lower contribution to the tax base and decreased productivity. In the meantime, 62 percent of the job openings in Pennsylvania in the current decade require

post-secondary education with that number expected to rise in the future.<sup>7</sup>

### Increasing Sales of Local Goods and Services by Investing In High Quality Pre-K

This research by Ready Nation/AMERICA'S EDGE found that attracting skilled employees, strengthening local and state economies now, and improving businesses' bottom lines can be achieved through cost effective and proven investments in quality early childhood education programs.<sup>8</sup>



In order to calculate how investments in pre-k can impact local and state economies, ReadyNation/AMERICA'S EDGE utilized an economic model to track how those dollars would have an impact. This report used IMPLAN, an economic modeling system first developed in 1993 that is widely used for conducting a variety of economic impact and related analyses, to find the impact. This study employed

the most recently available (2012) data sets and IMPLAN models and adheres fully to standard input-output and IMPLAN conventions (see Appendix A for a complete explanation of IMPLAN and the report's methodology).

This economic impact modeling system found that, for every additional \$1 invested in pre-kindergarten in Pennsylvania, \$1.79 is generated in total spending within the state. This strong economic boost for local businesses is higher than investments in other major sectors such as manufacturing (\$1.68), retail trade (\$1.77) and wholesale trade (\$1.75).<sup>9</sup> Research shows that among Pennsylvania's major economic sectors that will spur economic

## The early learning sector in Pennsylvania generates more additional spending in the economy than other major economic sectors

### Economic Sectors

### Output Multipliers

|                                   |             |
|-----------------------------------|-------------|
| Transportation                    | \$1.85      |
| Construction                      | 1.84        |
| <b>Early Care and Education</b>   | <b>1.79</b> |
| Retail Trade                      | 1.77        |
| Other                             | 1.76        |
| Wholesale Trade                   | 1.75        |
| Farming, Forest, Fishing, Hunting | 1.72        |
| Manufacturing                     | 1.68        |
| Mining, Oil, Gas                  | 1.66        |
| Utilities                         | 1.43        |

Every \$1 invested in the early learning sector generates an additional 79 cents in the local economy.

Source: IMPLAN 2012 analysis of Type 5AM Output Multipliers for Pennsylvania

growth, early education offers one of the smartest ways to create additional buying power for consumers and help local companies stay in business.

ReadyNation/AMERICA's EDGE used the IMPLAN model to understand the potential economic benefits to Pennsylvania and its economic regions of significant investment in expanding access to high-quality pre-k for 3- and 4-year-olds. We then ran two scenarios to illustrate potential expansion possibilities.

The first scenario examined the impact of fully funding the state's existing Pre-K Counts program of high-quality pre-k. This scenario assumes that Pennsylvania would accelerate and meet its goals to provide all 3- and 4-year-olds from disadvantaged families (those making under 300% of the federal poverty level) access to high-quality pre-k at current Pre-K Counts funding levels (\$7,900 per child). The scenario also assumes that 70%—or 88,000—of unserved children would enroll, requiring a total annual investment of nearly \$700 million.<sup>10</sup> When that level of investment in pre-k is run through the IMPLAN model, ReadyNation/AMERICA's EDGE finds that would yield \$550 million in additional sales in Pennsylvania's economy outside of early education, for a total of \$1.2 billion of new money infused into the state economy (see Appendix B).<sup>11</sup> And most of these dollars generated in Pennsylvania would stay in Pennsylvania—helping local businesses improve sales in almost every sector.

In addition, we examined what the impact would be if additional funds were identified to meet the remainder of

Pennsylvania's unserved need for high-quality pre-k. In this scenario, ReadyNation/AMERICA's EDGE estimates that another 80,000 children would enroll in high-quality pre-k across the Commonwealth, supported by an additional state investment of up to \$326 million, based on partial state funding to support increased access for all 3- and 4-year-olds. The IMPLAN model shows that level of investment would generate an additional \$255 million in spending across the Commonwealth for a total of \$580 million.

If we combine the two scenarios, the total impacts are significant. We estimate additional economic activity totaling:

- **Over \$179 million in new sales in the state's services sector.** The additional dollars would benefit many small businesses including dry cleaners, mobile phone and cable companies, and numerous professional firms such as accounting, law and tax offices.<sup>12</sup>

**Research shows that among Pennsylvania's major economic sectors that will spur economic growth, early education offers one of the smartest ways to create additional buying power for consumers and help local companies stay in business.**

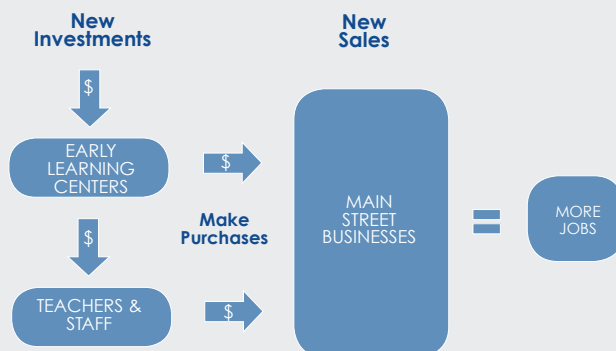
## Early Learning Spending Stays in Pennsylvania

Here's how it works:

The dollars initially invested in an early learning program re-circulate through the local economy. The first dollar of spending goes directly to early education programs, and the additional spending is generated in two ways: (1) when early learning centers purchase local goods and services to operate their programs; and (2) when early learning teachers and staff spend their wages on local goods and services. All this additional spending is generated through what is known as the “multiplier effect.”

Although every industry generates some additional spending in these two ways (see table on page 2 for a comparison of economic output multipliers for different sectors), the early care and education sector has one of the highest output multipliers because a high proportion of the spending by early learning programs and staff is spent locally. Much of the investment in early education goes to teacher wages, and the person-to-person nature of this service means that it must be provided and delivered locally. This is different from many industries that are based on products that could be manufactured outside of Pennsylvania or on services that can be provided remotely (e.g., customer service

### Early Learning Investments Help Pennsylvania Businesses



representatives via phone lines from other states or even internationally).

In turn, since early education teachers and staff are low- and moderate-wage workers (preschool teachers have mean annual incomes of \$27,260 in Pennsylvania), they typically spend rather than save their wages, purchasing local goods and services, including housing and retail products.

Here's what this means in actual dollars and cents: Every dollar spent on early education in Pennsylvania yields a total of \$1.79 in the state economy.

- **Over \$135 million in new sales in real estate and construction**—providing a boost to the real estate market.<sup>13</sup> The

income generated by spending on expanded Pre-K will also help many low- and middle-income families keep up with their mortgage or rental payments.

- **Over \$143 million in new dollars to Pennsylvania's insurance and finance sectors**, including local banks and insurance companies.<sup>14</sup>

- **Over \$103 million in new sales in Pennsylvania's retail and wholesale trade sectors**, including grocery stores, department stores and auto dealers.<sup>15</sup>

The \$800 million in additional spending that happens outside of early education will support economic activity in over 400 economic categories. Of those 400-plus categories, here are just a few concrete examples of increased sales for Pennsylvania businesses:

- Over \$34.3 million in sales at local restaurants, the cost for over 9,000 households of four to eat out for one year;<sup>16</sup>

- Over \$15.4 million in sales from local electric companies, the cost of monthly electric bills for over 8,900 families of four for one year;<sup>17</sup>

- Over \$7.6 million in sales from local supermarkets, the cost of a year of groceries for over 1300 families of four;<sup>18</sup>

- Over \$21.2 million in sales from telecommunications, equal to the annual cost of telephone services for over 12,000 families of four;<sup>19</sup>

The bottom line is that investments in the early learning sector are very competitive with investments in other major sectors, and these investments create an immediate infusion of dollars throughout Pennsylvania's local businesses.

## Almost 28,000 New Jobs in Pennsylvania

Fully investing in early education would also create thousands of new jobs. For every twenty jobs created in the early education sector, five jobs are created outside that sector in Pennsylvania's economy.<sup>20</sup>

An analysis of the IMPLAN economic data for Pennsylvania shows that a \$1 billion investment to offer access to high-quality pre-k to all Pennsylvania 3- and 4-year-olds would create almost 28,000 new jobs, including 5,600 new jobs in other economic sectors.<sup>21</sup> These additional jobs are created when expanded early learning programs and their employees purchase additional local goods and services. As demand for goods increases, so does the need to supply those goods, which creates jobs.

Thus, investment in early learning, with the increased spending power from newly-employed individuals, would help Pennsylvania reduce its unemployment rate and immediately strengthen local businesses.

## Attracting Skilled Employees

Even in tough economic times, businesses often struggle to attract qualified applicants to fill skilled positions. Nearly 53,000 Pennsylvania 3- and 4-year-olds are currently attending high-quality, publicly funded pre-k programs. However, approximately 244,000 3- and 4-year-olds do not have access to high-quality, publicly funded pre-k, including nearly 126,000 disadvantaged 3- and 4-year-olds.<sup>22</sup> A significant number of these children would likely participate if high-quality, affordable programs were available in their neighborhoods. Like strong K-12 education systems, high-quality early education can help attract skilled workers and new businesses.

## LONG-TERM BENEFITS FOR ECONOMIC SECURITY

In addition to jump-starting Pennsylvania's economy and creating thousands of new jobs, major investments in quality early learning programs would also have important long-term benefits that would establish a foundation for sustained economic growth.

To remain competitive in the global marketplace, businesses need employees with hard skills (math, reading, writing) and soft skills (communication, collaboration and critical thinking). But employers are experiencing a significant shortage of workers with the skills they need.

## The Perry Preschool Program

One of the best known studies of early education for 3- and 4-year-olds, the High/Scope Perry Preschool Program in Ypsilanti, Michigan, followed the children who attended the preschool until they were age 40. From 1962 through 1967, preschool teachers worked intensively with low-income children ages 3 and 4. The children attended preschool during the week and teachers came to their homes once a week to coach their parents. When the children were age 40, researchers compared their life stories with those who did not participate in the early education program. The payoff was impressive. Children who participated in the preschool program had significantly higher reading achievement and arithmetic achievement scores at age 14 compared to the children not participating in the program; 44 percent more of the children in the Perry program graduated from high school; and 60 percent of participants were earning upward of \$20,000 a year in their forties, versus 40 percent of those in the control group.

According to a 2006 survey, less than a quarter of employers (only 23.9 percent) report that new entrants with four-year college degrees have "excellent" basic knowledge and applied skills, and significant deficiencies exist among entrants at every level.<sup>23</sup>

The deficiencies are greatest with high school graduates: 42.4 percent of employers report the overall preparation of high school graduates as deficient; 80.9 percent report deficiencies in written communications; 70.3 percent report deficiencies in professionalism; and 69.6 percent report deficiencies in critical thinking.<sup>24</sup> Although preparedness increases with education level, employers note significant deficiencies remaining among graduates of the four-year colleges in written communications (27.8 percent), leadership (23.8 percent), and professionalism (18.6 percent).<sup>25</sup>

High-quality early education is a critical step to support the development of the skills that businesses require in their workforce. Research studies demonstrate that children who participate in high-quality early learning can do better on a range of outcomes. Here are examples of what outcomes are impacted and what is possible:

- **Better preparation to succeed in elementary school**—for example, children who participated in a pre-kindergarten program

## Early Care and Education in Pennsylvania: An economic snapshot

Pre-kindergarten programs typically serve young children ages 3 and 4. These programs take several forms, including private preschool programs and publicly funded early education programs including public pre-kindergarten and Head Start. In Pennsylvania, approximately 244,000 3- and 4- year olds do not have access to high-quality, publicly funded pre-K, including nearly 126,000 disadvantaged 3- and 4-year-olds.

Early education is an important economic sector in Pennsylvania, making significant contributions to the local economy:

in Boston had improvements in math, literacy and language skills equivalent to seven months of additional learning, compared to non participants;<sup>26</sup>

- **Improved academic outcomes well into elementary school**—for example, children in counties that invested more in North Carolina’s Smart Start and More at Four early education initiatives were five months ahead in reading at third grade and three to five months ahead in math by third grade, when compared to children in counties that invested less;<sup>27</sup>

- **Less special education**—children who attended the Chicago Child-Parent Centers (CPC) program were 40 percent less likely to need special education.<sup>28</sup> Children who attended New Jersey’s state preschool program were 31 percent less likely to need special education.<sup>29</sup>

- **Lower rates of retention in school**—children participating in the Abecedarian early education program were 43 percent less likely to be held back in school and children who attended New Jersey preschool were 40 percent less likely to be held back by 4th and 5th grades.<sup>30</sup>

- **Higher rates of high school graduation**—children attending the Perry Preschool program were 44 percent more likely to graduate from high school.<sup>31</sup> Children attending CPC were 29 percent more likely to graduate;<sup>32</sup>

- Early education programs represent a sizable small business sector in the state. The sector employs nearly 15,000 (14,930) early care and education administrators and preschool teachers.

- 67 percent of children under the age of 6 in Pennsylvania (567,000 children) have both or their only parent in the workforce.

- **Less crime**—children not offered the Perry program were five times more likely to become chronic offenders by age 27;<sup>33</sup> and

- **Higher rates of employment**—children in Perry were 22 percent more likely to be employed at age 40.<sup>34</sup>

Studies of high-quality early education programs for at-risk children have shown that these programs average \$22,000 in net economic benefits (benefits minus costs) for each child served.<sup>35</sup> These long-term benefits are realized when the children who receive high-quality early learning grow up and become better educated and more productive workers, with far less remedial education or criminal costs to society. That is a return on investment that cannot be matched by almost any other public investment.

## CONCLUSION

Research is clear that investments in high-quality early education will help jump-start our economy through an immediate increase in sales for Pennsylvania businesses and the creation of many new jobs. At the same time, we will be building the skills of our future workforce. Policy-makers must make difficult decisions about where to invest limited funds. Funding for early education should be a priority since it is one of the best ways we can immediately strengthen our economy while creating lasting economic security.



## Appendix A: Economic Multipliers Analysis

Economists have documented the contributions that the early education sector makes to the economy in the short term through economic multiplier effects.

The short-term economic development benefits of the early care and education sector are based on estimates calculated from what are called input-output economic models. These models show the linkages between all sectors in the economy, creating a matrix detailing how spending in each sector ripples through other economic sectors via the purchases of goods and services from other sectors.

There are three types of economic linkage effects that this input-output analysis captures. Direct effects of new spending in the early education sector are seen within the sector itself, through new money spent on early education programs. Indirect effects reflect the inter-industry expenditures generated when early education businesses purchase goods and services from other sectors. These businesses, in turn, are stimulated to increase their input purchases, and so on in widening ripple effects throughout the economy. Induced effects reflect similar economy-wide impacts due to the increased spending on goods and services of early education workers as first their wages increase, and then the wages of workers in other affected industries increase. The combined linkage effect of indirect (inter-industry spending) and induced (household spending) is called a Type SAM multiplier.

Early learning investments generate new dollars and jobs throughout Pennsylvania's economy. Every new dollar spent on early learning yields a total of \$1.79 in the state economy.

ReadyNation/AMERICA'S EDGE commissioned an analysis of the most recently available data for Pennsylvania on the economic impact of the early education sector on other sectors.

All input-output modeling results were generated using the Minnesota IMPLAN Group, LLC (MIG, Inc.) IMPLAN® economic impact modeling system. First developed in 1993, the system now is in widespread use for conducting a wide variety of economic impact and related analyses.

This study employed the most recently available (2012) data sets and IMPLAN models. One model was created for Pennsylvania. Our modeling approach and analyses adhere fully to standard input-output and IMPLAN conventions.

Multipliers were generated for the model using two separate sets of assumptions about regional purchase coefficients (RPC), or the proportion of purchases in each sector that occur regionally (locally). First, the multipliers were generated based on estimates from MIG, Inc.'s National Trade Flow Model. Second, in order to facilitate comparison

with earlier IMPLAN modeling work, multipliers were also generated based on the previous IMPLAN standard for RPC estimates, namely an econometric model.

The reported results are based on fully disaggregated models (i.e. 440 distinct sectors). The disaggregated sectors are defined by MIG, Inc. but are based upon and cross-walked with the North American Industrial Classification System (NAICS), which several years ago replaced the Standard Industrial Classification (SIC) code system. Additional analysis was also conducted using models we aggregated into a small number of very broad sectors (e.g. Agriculture, Manufacturing, Services, etc.).

To illustrate the impact of increased spending on early learning, we used the models created to estimate the indirect and induced effects on each sector of the economy of exogenous increases (e.g. of a \$1,000,000 base investment) in the demand for early education services. Because government spending is determined as much by policy decisions as by the regional dynamics of economic forces, government spending is conventionally treated as a source of exogenous demand. We focus on this source.

For additional information and background on input-output analyses of the early education sector, see the following resources:

Zhilin, L., Ribeiro, R., & Warner, M. (2004). Child care multipliers: Analysis from fifty states. Linking Economic Development and Child Care Research Project. Ithaca, NY: Cornell University, Cornell Cooperative Extension. Retrieved from <http://government.cce.cornell.edu/doc/pdf/50StatesBrochure.pdf>

Zhilin, L., Ribeiro, R., & Warner, M. (2004). Comparing child care multipliers in the regional economy: Analysis from 50 states. Linking Economic Development and Child Care Research Project. Ithaca, NY: Cornell University, Cornell Cooperative Extension. Retrieved from <http://government.cce.cornell.edu/doc/pdf/50States.pdf>

## Appendix B

### New spending generated by early care and education investments

| Location                           | Percent of unmet need, relative to state | Total new investment to serve unmet need for pre-K for 3- and 4-year-olds | Total new spending generated in the economy | Total new spending generated outside the early education sector | Spending by Major Sector |                                    |                             |                            |
|------------------------------------|--|---|---|---|--------------------------|------------------------------------|-----------------------------|----------------------------|
|                                    |  |   |   |   | Services (23%)           | Real estate and construction (17%) | Insurance and finance (18%) | Retail and wholesale (13%) |
| Pennsylvania                       | 100%                                     | \$1 billion   | \$1.8 billion                               | \$790 million   | \$179 million            | \$135 million                      | \$143 million               | \$103 million              |
| Southeastern PA <sup>1</sup>       | 34%                                      | \$340 million   | \$609 million                               | \$269 million   | \$61 million             | \$46 million                       | \$49 million                | \$35 million               |
| Southwestern PA <sup>2</sup>       | 18%                                      | \$180 million   | \$322 million                               | \$142 million   | \$32 million             | \$24 million                       | \$26 million                | \$18 million               |
| Northeast region <sup>3</sup>      | 4%                                       | \$40 million  | \$72 million                                | \$32 million  | \$7 million              | \$5 million                        | \$6 million                 | \$4 million                |
| Lehigh Valley <sup>4</sup>         | 6%                                       | \$60 million  | \$107 million                               | \$47 million  | \$11 million             | \$8 million                        | \$8 million                 | \$6 million                |
| Capital region <sup>5</sup>        | 6%                                       | \$60 million  | \$107 million                               | \$47 million  | \$11 million             | \$8 million                        | \$8 million                 | \$6 million                |
| State College region <sup>6</sup>  | 1%                                       | \$10 million  | \$18 million                                | \$8 million   | \$2 million              | \$1 million                        | \$1 million                 | \$1 million                |
| Erie County                        | 2%                                       | \$20 million  | \$36 million                                | \$16 million  | \$3 million              | \$3 million                        | \$3 million                 | \$2 million                |
| Lancaster-York region <sup>7</sup> | 9%                                       | \$90 million  | \$161 million                               | \$71 million  | \$16 million             | \$12 million                       | \$13 million                | \$9 million                |

<sup>1</sup>Southeastern region includes the counties of Bucks, Chester, Delaware, Montgomery and Philadelphia

<sup>2</sup>Southwestern region includes the counties of Armstrong, Allegheny, Beaver, Butler, Fayette, Greene, Indiana, Lawrence, Washington and Westmoreland

<sup>3</sup>Northeast region includes the counties of Lackawanna, Luzerne and Wyoming

<sup>4</sup>Lehigh Valley includes the counties of Carbon, Lehigh and Northampton

<sup>5</sup>Capital region includes the counties of Cumberland, Dauphin, Lebanon and Perry

<sup>6</sup>State College region includes Centre county

<sup>7</sup>Lancaster-York region includes the counties of Lancaster and York

Source: IMPLAN 2014, using 2012 Pennsylvania data and statewide IMPLAN models; Pennsylvania Partnerships for Children data on unmet need (children age 3-4 without access to publicly funded, high-quality pre-K)

Notes: For Pennsylvania, input-output modeling analyses were conducted to identify economic impacts. Pennsylvania's Type SAM output multiplier was \$1.79. For the various regions, the figures above represent a proportional estimate of the statewide economic impact, estimated based on the proportion of unmet need in those locations.

## Appendix C

ReadyNation/AMERICA'S EDGE estimates that approximately \$1 billion (\$1,023,050,000) in new early education investments are needed in Pennsylvania to serve an additional 170,800 children ages 3-4 who do not have access to publicly funded, high-quality Pre-K.

### Children unserved

The number of children ages 3-4 lacking access to high-quality, publicly funded Pre-K (244,024 rounded to 244,000) was obtained from a recent report by the Pennsylvania Partnerships for Children. This figure includes approximately 126,000 disadvantaged children (125,862, rounded to 126,000; "disadvantaged" is defined as coming from families at or below 300 percent of the federal poverty level), as well as 118,000 non-disadvantaged children (244,000 minus the 126,000 disadvantaged children).

Pennsylvania Partnerships for Children (2014, February). A smart choice for a solid start: The case for pre-K in PA. [http://papartnerships.org/publication\\_files/state-of-pre-k-county-table-legal.pdf](http://papartnerships.org/publication_files/state-of-pre-k-county-table-legal.pdf)

### Calculations for per-child and total costs for early education investments

Per-child cost for Pre-K is estimated at \$7,900 for disadvantaged children. We estimate the per-child cost for non-disadvantaged children as half that amount, \$3,950, assuming a sliding fee scale with only some of the costs being covered by public funding. These figures are based on the current estimated cost per child for the Pre-K Counts program (\$7,900).

To calculate the new investment needed to serve 3- and 4-year-olds who currently lack access, we estimated that 70 percent of these children would enroll in high-quality, publicly-funded Pre-K if it were available. Multiplying the per-child cost (\$7,900) by the number of new disadvantaged children to be served, an additional 88,200 children (70 percent of the estimated 126,000 disadvantaged children currently lacking access), yields an estimated \$697 million (\$696,780,000) in new early education spending needed to serve disadvantaged 3- and 4-year-olds. Multiplying the per-child cost for non-disadvantaged children (\$3,950) by an additional 82,600 children (70 percent of the estimated 118,000 non-disadvantaged children currently lacking access), yields an estimated \$326 million (\$326,270,000) in new spending needed to serve non-disadvantaged 3- and 4-year-olds. Adding those two new spending figures together, a total of \$1 billion (\$1,023,050,000) in new spending is

needed to serve all 3- and 4-year olds who currently lack access to high-quality, publicly funded Pre-K.

### Economic multipliers calculations for new investments needed

The \$1.8 billion estimate of the total new spending generated in Pennsylvania's economy from \$1 billion in new early education spending was calculated by taking the Type SAM Output multiplier for Pennsylvania, \$1.79, and multiplying it by the \$1 billion, which yields \$1.8 billion in new spending. This new spending includes the \$1 billion new direct spending in the ECE sector, plus the new indirect and induced spending (with a subtotal of \$790 million) which ripple out to other sectors of Pennsylvania's economy, yielding \$1.8 billion in new total spending.

## Endnotes

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- <sup>5</sup>For example, the Chicago Child-Parent Centers preschool program reported a 29% increase in high school graduation rates, Michigan's Great Start Readiness program reported a 35% increase and the Perry Preschool Program saw a 44 percent increase. Reynolds, A. J., Temple, J. A., Robertson, D. L., & Mann, E. A. (2001, May 9). Long-term effects of an early childhood intervention on educational achievement and juvenile arrest: A 15-year follow-up of low-income children in public schools. *Journal of the American Medical Association*, 285, 2339-2346; Michigan Great Start Readiness Program evaluation 2012: High school graduation and grade retention findings. Retrieved from <http://bridgemi.com/wp-content/uploads/2012/06/GSRP-evaluation-may-21-12.pdf>; Schweinhart, L.J., Montie, J., Xiang, Z., Barnett, W.S., Belfield, C.R., & Nores, M. (2005). Lifetime effects: The High/Scope Perry Preschool study through age 40. Ypsilanti, MI: High/Scope Press.
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- <sup>8</sup>High-quality early education programs include the following essential features: Highly-qualified teachers with appropriate compensation, comprehensive and age-appropriate curricula, strong family involvement, small staff-to-child ratios to ensure that each child gets sufficient attention, small, age-appropriate class sizes, and screening and referral services for developmental, health, or behavior problems. Whitebook, M. (2003). Early education quality: Higher teacher qualifications for better learning environments—A review of the literature. Berkeley, CA: Institute of Industrial Relations. Retrieved from <http://iir.berkeley.edu/csce/pdf/teacher.pdf>; Katz, L. (1999). Curriculum disputes in early childhood education. Champaign, IL: Clearinghouse on Early Education and Parenting. Retrieved from [http://ceep.crc.uiuc.edu/early\\_care\\_and\\_educationarchive/digests/1999/katz99b.html](http://ceep.crc.uiuc.edu/early_care_and_educationarchive/digests/1999/katz99b.html); Goffin, S. G., & Wilson, C. (2001). Curriculum models and early childhood education: Appraising the relationship (2nd ed.). Upper Saddle River, NJ: Merrill/Prentice Hall; Some examples of a strong parent-involvement component include the home visits in the High/Scope Perry Pre-kindergarten and Syracuse University Family Development programs, the intensive parent coaching in Chicago Child-Parent Centers, and the parent volunteers in Head Start. For Perry Pre-kindergarten see: Schweinhart, L. J., Barnes, H. V., & Weikart, D. P. (1993). Significant benefits: The High/Scope Perry Pre-kindergarten study through age 27. Ypsilanti, MI: High/Scope Press. See also D. R. Powell (Ed.). (1988). Parent education as early childhood intervention: Emerging directions in theory, research, and practice (pp. 79-104). Norwood, NJ: Ablex Publishing. For preschool classrooms, the staff-to-child ratio should be not more than 10 children per teacher. American Academy of Pediatrics, American Public Health Association, and National Resource Center for Health and Safety in Child Care and Early Education (2002). Caring for Our Children: National Health and Safety Performance Standards: Guidelines for Out-of-Home Child Care Programs, 2nd edition. Elk Grove Village, IL: American Academy of Pediatrics and Washington, DC: American Public Health Association; Barnett, W.S., Epstein, D.J., Friedman, A.H., Sansanelli, R.A. & Hustedt, J.T. (2009). The state of preschool 2012: State preschool yearbook. New Brunswick, NJ: National Institute of Early Education Research; Dunkle, M., & Vismara, L. (2004). Developmental checkups: They're good, they're cheap and they're almost never done. What's wrong with this picture? Retrieved from <http://www.child-autism-parent-cafe.com/child-development.html>
- <sup>9</sup>READYNATION/AMERICA'S EDGE commissioned an analysis of the linkage effects of early education. Analyses were conducted using fully disaggregated models and using models aggregated into eleven very broad sectors. This analysis calculated the Type SAM (Social Accounting Matrix) Output multipliers for all eleven major aggregated economic sectors in the state using IMPLAN models. The analysis was conducted on 2012 data, the most recently available data set for Pennsylvania. The early education sector's Type SAM output multiplier for Pennsylvania was \$1.79. See Table for Type SAM output multipliers of each sector analyzed. See Appendix A, Economic Multipliers Analysis, for more details on analysis and methods.
- <sup>10</sup>Serving 70 percent of disadvantaged children is an estimate for providing early care and education services to all disadvantaged young children who are likely to participate. This is an upper-bound estimate of the full "take-up rate" for early care and education services, that is, the maximum proportion of families likely to participate in programs, given that some families use parental care exclusively or otherwise choose not to enroll in formal early care and education services. In states where universal pre-K is offered, take-up rates do not exceed this range (e.g., Oklahoma 74 percent; Florida 79 percent; Georgia 59 percent).
- <sup>11</sup>READYNATION/AMERICA'S EDGE estimates that \$1 billion in new early education investments are needed in Pennsylvania to serve an additional 170,800 children ages 3 to 4 who do not have access to publicly funded, high-quality pre-K. See

appendix B for calculations of new early education investments in Pennsylvania.

<sup>12</sup>The services sector includes professional, business, information, entertainment, rental, and utility services. It represented 22.7 percent of the new spending generated outside the early education sector. The \$179 million figure was calculated by taking 22.7 percent of \$790 million, which is the amount of the total \$1.8 billion in new spending that is generated outside the early education sector (the first \$1 billion invested is spent directly, in the early education sector).

<sup>13</sup>The real estate and construction sectors represented 17.1 percent of the new spending generated outside the early education sector. The \$135 million figure was calculated by taking 17.1 percent of \$790 million, which is the amount of the total \$1.8 billion in new spending that is generated outside the early education sector.

<sup>14</sup>The insurance and finance sectors represented 18.1 percent of the new spending generated outside the early education sector. The \$143 million figure was calculated by taking 18.1 percent of \$790 million, which is the amount of the total \$1.8 billion in new spending that is generated outside the early education sector.

<sup>15</sup>The retail and wholesale trade sectors represented 13 percent of the new spending generated outside the early education sector. The \$103 million figure was calculated by taking 13 percent of \$790 million, which is the amount of the total \$1.8 billion in new spending that is generated outside the early education sector.

<sup>16</sup>Based on input-output analysis using fully disaggregated IMPLAN models with 440 distinct economic sectors in the 2012 Pennsylvania model. See Appendix A, Economic Multipliers Analysis, for more details on analysis and methods. Bureau of Labor Statistics. (2012). Consumer Expenditure Survey. Washington, DC: U.S. Department of Labor. Retrieved from <http://www.bls.gov/cex/>. Based on the national figure for yearly out-of-home food for a household of four people.

<sup>17</sup>Based on input-output analysis using fully disaggregated IMPLAN models with 440 distinct economic sectors in the 2012 Pennsylvania model. See Appendix A, Economic Multipliers Analysis, for more details on analysis and methods. Bureau of Labor Statistics. (2012). Consumer Expenditure Survey. Washington, DC: U.S. Department of Labor. Retrieved from <http://www.bls.gov/cex/>. Based on the national figure for yearly spending on electricity for a household of four people.

<sup>18</sup>Based on input-output analysis using fully disaggregated IMPLAN models with 440 distinct economic sectors in the 2012 Pennsylvania model. See Appendix A, Economic Multipliers Analysis, for more details on analysis and methods. Bureau of Labor Statistics. (2012). Consumer Expenditure Survey. Washington, DC: U.S. Department of Labor. Retrieved from <http://www.bls.gov/cex/>. Based on the national figure for yearly spending on food at home for a household of four people.

<sup>19</sup>Based on input-output analysis using fully disaggregated IMPLAN models with 440 distinct economic sectors in the 2012 Pennsylvania model. See Appendix A, Economic Multipliers Analysis, for more details on analysis and methods. Bureau of Labor Statistics. (2012). Consumer Expenditure Survey. Washington, DC: U.S. Department of Labor. Retrieved from <http://www.bls.gov/cex/>. Based on the national figure for yearly spending on telephone services for a household of four people.

<sup>20</sup>The linkage effects of the early education sector were analyzed using IMPLAN models for Pennsylvania using 2012 data, the most recently available for the

state. The Type SAM employment multiplier for early education for Pennsylvania was 1.25. This means that for every one new job in the ECE sector, an additional 0.25 jobs are created outside that sector in other parts of the state economy.

Multiplying both numbers by twenty yields this reformulation of the same finding: for every twenty jobs created in the ECE sector, five jobs are created outside the sector.

<sup>21</sup>The \$1 billion investment in early education programs was applied to the 2012 Pennsylvania employment multiplier findings for the ECE sector (with a Type SAM multiplier of 1.25 using IMPLAN), and yielded 27,935 total jobs, or almost 28,000 jobs), with 5,609 (rounded to 5,600) of these jobs being in other economic sectors outside early education. See Appendix A, Economic Multipliers Analysis, for more details on analysis and methods.

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<sup>23</sup>Casner-Lotto, K., & Benner, M.W. (2006). Are they really ready to work? Employers' perspectives on the basic knowledge and applied skills of new entrants to the 21st century U.S. workforce. Retrieved from: [http://www.21stcenturyskills.org/documents/FINAL\\_REPORT\\_PDF09-29-06.pdf](http://www.21stcenturyskills.org/documents/FINAL_REPORT_PDF09-29-06.pdf)

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