

Voluntary Pre-Kindergarten for All A Cost-Benefit Analysis for the State of Maryland

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Study conducted by RESI, Towson University for the Task Force on
Universal Preschool Education



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I. Executive Summary

The Feasibility Study examines the economic impacts of implementing and financing a high-quality, voluntary pre-kindergarten-for-all program in Maryland. One critical aspect of the feasibility of voluntary pre-k for all children is developing an understanding of the costs and the benefits of this type of a program. To that end, the Regional Economic Studies Institute (RESI) of Towson University reviewed the literature and, using methodological techniques and Maryland-specific data, calculated the costs and benefits of a voluntary pre-k program for all children in Maryland. The study examines the option of expansion to four year olds only as well as to both three and four year olds.

The study identifies existing resources for pre-k education, resource development from public and private sectors, and at least two models of identifying new funding sources. The study examines existing funding mechanisms to determine their applicability to financing additional pre-k programs in Maryland.

As part of a study on the feasibility of voluntary pre-k for all children in the state of Maryland, faculty from Towson University's Department of Childhood Education also interviewed professionals in the field of early education and care.

The results of the feasibility study were presented to the Task Force. Its recommendations informed the Task Force in its deliberations.

Main Findings

The costs of a pre-k-for-all program are easily identified, immediate, and tangible, while the benefits are more difficult to quantify, occur in the future, and are somewhat intangible. Our cost benefit analysis reveals a significant return to Maryland from having a pre-k-for-all program.

Briefly, for a program open to all four year olds, the findings for FY09 are:

- The per-child cost (net of current spending) is \$2,990;
- The long-term benefit per child are projected to be in 2050 \$14,506
- For every dollar invested in a one-year pre-k program, Maryland will receive \$4.85 in net benefits or a benefit-cost ratio of 4.85.

The findings for a program open to all three and four olds are:

- The per-child cost (net of current spending) is \$4,022;
- The long-term benefit per child is projected to be \$16,247
- For every dollar invested in a one-year pre-k program, Maryland will receive \$2.08 in net benefits or a benefit-cost ratio of 2.08.

From a purely economic perspective, pre-k for all four year olds will offer a significant rate of return on the investment. Currently, 14 states have established legal mandates for voluntary pre-k for all. Maryland has made significant progress on this issue by establishing the legal mandate

under the Bridge to Excellence for Public Schools Act (2002) requiring local school systems to provide pre-k access to all four year olds from “economically disadvantaged backgrounds.” As of 2007, all local school systems have met that requirement and increased enrollment to 38 percent of Maryland four year olds.

As part of the feasibility study, we assumed that in 2009, enrollment in the voluntary pre-k for all would be 70 percent of all four year olds. The estimated enrollment in the proposed kindergarten for 2009 would be 52,294 four year olds. Currently, the state spends \$84 million to serve 25,681 four year olds. Any expansion of access to pre-k would potentially impact more than 26,000 additional four year olds. Pre-k services are defined as, at a minimum, two and a half hours per day, five days per week, and 180 days per year, mostly provided in public schools.

Financing Options

Below are listed the federal, state, and other financing programs that may enable Maryland to implement and expand a voluntary pre-k-for-all program.

There are four state-funded initiatives that provide financing for pre-k programs:

1. State Pre-k (formerly: Extended Elementary Education Program (EEEP)) (funds were redirected to state aid),
2. Preschool Special Education Services (state funded)
3. State Aid to Education.

There are five major federal initiatives that provide funding for pre-k programs:

1. Child Care Development Funds (CCDF) and Temporary Assistance to Needy Families (TANF) Funds,
2. Head Start,
3. Title I - Elementary and Secondary Education Act (ESEA),
4. Tax Policy, i.e., Child Care Tax Credit, and
5. Individual Disabilities Education Act (IDEA)

A dedicated funding source can help alleviate some of the financial dilemmas of funding a voluntary pre-k program by generating new revenue streams. Around the nation, many states have successfully dedicated specific funding sources to support pre-k programs, although most states primarily fund pre-k programs through general funds. Some examples of dedicated funding sources are outlined below.

- **Local Property Taxes:** Through a public referendum (Proposition J), San Francisco, CA was able to appropriate a percentage of local property taxes for children’s services. The funds generated can be used for early childhood development, youth development, and family support.¹

¹ <http://www.earlychildhoodfinance.org/handouts/NACOarticle.pdf>

- **Excise Taxes:** Arizona’s Proposition 203 (Arizona Childhood Development and Health Initiative) established an early childhood and health fund, consisting of revenues generated by an increase in the state tax on tobacco products.²
- **Foundation Programs:** The Minnesota Early Learning Foundation (MELF) issues grants to promising high-quality demonstration programs and parent scholarships for families of pre-k-age children. It functions as an incorporated nonprofit organization in partnership with corporations, foundations, and the civic sector to foster school readiness.
- **Lottery/Gaming Set Asides:** Georgia’s Universal Pre-kindergarten Program receives annually more than \$325 million through the state lottery and distributes grants to early care and education providers which meet specific high quality standards.

This report complements the recommendations of the Task Force on Universal Preschool Education and establishes the basis for discussion of the costs and benefits of expanding pre-k services to all four year olds in Maryland. It provides a long-term view on how Maryland would benefit from establishing such a program over the next few years.

² <http://www.ncsl.org>

II. Introduction

Recent longitudinal studies have touted the long-term, positive benefits of a high-quality pre-kindergarten experience on children's lives. Factors such as a strengthened commitment to school readiness, an increased awareness of the school achievement gap, and a start on the path to financial stability and independence, call for a more in-depth look into the impacts of a pre-k-for-all program in Maryland. Based on two existing models the Universal Pre-kindergarten Study was developed to examine the feasibility and potential economic impacts of a high-quality pre-k program for all three and four year olds.³ The report's focus is on three important areas of consideration as described below.

One critical aspect of the feasibility of voluntary pre-k for all children is developing an understanding of the costs and benefits of such a program. To that end, the Regional Economic Studies Institute (RESI) of Towson University reviewed the literature and, using methodological techniques and Maryland-specific data, calculated the costs and benefits of a voluntary pre-k-for-all program in Maryland.

In addition, faculty from Towson University's Department of Early Childhood Education interviewed early education professionals to determine their views related to offering publicly funded pre-k to all age-eligible children in Maryland.

The study identifies existing resources and funding mechanisms from public and private sectors for current pre-k programs and at least two models identifying new funding sources for a pre-k-for all program in Maryland.

Finally, the report provides a series of recommendations drawn from our analysis and research to effect the implementation, financing and acceptance of a voluntary pre-k program in Maryland.

Cost Benefits

Numerous studies have confirmed that the benefits of high-quality pre-k outweigh the costs to society. Typically, the benefits of a pre-k education include increased earnings for the students and their parents, increased income tax revenues, increased high school graduation rates and college attendance, reduced juvenile and adult crime, reductions in child welfare costs, and reductions in K-12 and special education costs. There are numerous other benefits that are difficult to measure and include savings from reduced adult welfare usage, improved health and well-being of participants, positive outcomes for the children of participants, and other important life changes. Additionally, there are many indirect economic and non-economic benefits such as attractiveness of the state to highly qualified workers, workforce performance, social returns to education, social and economic equality, and international competitiveness. As a result, monetary benefits in the benefit-cost analysis are likely to be underestimated.

Currently, at the national level, pre-k is provided to economically disadvantaged children and families through the Head Start program, which is funded by the federal government. Additionally, 38 states fund a pre-k program for disadvantaged children, but only Georgia,

³ The Universal Pre-K Study is prepared on behalf of the Maryland State Department of Education with the support of Pre-K Now, a national public education and advocacy organization that collaborates with advocates and policymakers to advance high-quality, voluntary pre-k for all three and four year olds.

Florida, and Oklahoma have state-funded pre-k programs for all four year olds. Four other states are phasing in pre-k for all: New York, West Virginia, Iowa, and Illinois. Five states — Maine, Wisconsin, Oklahoma, West Virginia, and Vermont — support pre-k through the school funding formula. In these states, if a district chooses to participate, all children in that district have access to pre-k. Many other states are evaluating the feasibility of expanding access to pre-k.

Two noteworthy studies, Lynch (2007), detailing the benefits and costs of pre-k for each state, and Karoly and Bigelow (2005), which examines the benefits and costs of pre-k for all in California, are based on the findings of the Chicago Longitudinal Study (CLS) of the Chicago Child-Parent Centers (CPC) program. The CPC program is a large-scale, high-quality public program, serving disadvantaged children for more than 40 years.

The CLS has found that children in the CPC program experienced statistically significant positive effects, such as:

- 10.2 percent reduction in special education placements through age 18;
- 15.4 percent reduction in grade retention through age 15;
- 5.3 percent decrease in incidence of child abuse and neglect from ages four to 17;
- 8.2 percent decrease in number of arrests by age 18; and
- 11.2 percent increase in high school graduation rate at age 20.

The CPC's success is based on an effective curriculum, parental involvement, small classes and child-to-teacher ratios, health and nutrition services, and well-educated, well-paid instructors. Reynolds et al. (2002) has calculated the benefit-cost ratio for the CPC of 7.1 to 1. When intangible benefits from reduced crime incidence were included, the benefit-cost ratio rose to 10.15 to 1.

Karoly and Bigelow (2005) analyze a proposed high-quality pre-k program for all four year olds in California. According to their findings, the program would generate about \$7,000 in 2003 dollars in net present value (NPV) benefits per child for California's residents and government using a 3 percent discount rate. The benefit-cost estimates depend on the assumptions about the distribution of benefits between less- and more-advantaged children. Depending on these assumptions, Karoly and Bigelow expect California to gain between two and four dollars for every invested dollar.

Lynch (2007) analyzes the benefits and costs of two types of voluntary, high-quality pre-k programs on a national level and a state-by-state breakdown. The first type of program considered is targeted to three and four year olds from families in the lowest quarter of the income distribution. The second type of program is one for all three and four year olds. The benefit-cost analysis is conducted for the period 2007 through 2050.

In Maryland, according to Lynch, the annual budget benefits of the targeted program will surpass the annual costs within nine years. The cost of such a program would be around \$6,300 per participant in 2006 dollars. By the year 2050, every tax dollar invested in the program is estimated to yield \$3.52 in budget savings. For the pre-k for-all program, the annual budget benefits will surpass the annual costs within 18 years. In the year 2050, the total annual benefits

are estimated to exceed the program costs by a ratio of 8.7 to 1. Finally, for every dollar invested, the pre-k for-all program is estimated to return \$2.08 in budget savings in the year 2050.

Other benefit-cost analyses of early childhood interventions include the High/Scope Perry Preschool Project and the Abecedarian Early Childhood Intervention program. These programs have been extensively researched and the findings disseminated.

The High/Scope Perry Preschool Project (1962-67) randomly selected 123 African American children with low IQ's from low-income families. The children were randomly assigned to a pre-k or to a control group, and evaluations of participants were conducted through age 40. Several studies have documented significant effects of the Perry program on crime, education attainment, earnings, and welfare. A benefit-cost analysis by Barnett (1993), based on results through age 19 and forecasts beyond age 19, found a benefit-cost ratio of 8.74 to 1. Karoly et al (1998) found a benefit-cost ratio of the Perry program of 4.1 to 1. (This study did not include reductions in the intangible losses due to crime.) By the time the participants turned 40, Schweinhart et al (2005) found that the benefit-cost ratio had grown to about 16 to 1, while the benefit-cost ratio not including the intangible crime benefits was about 5 to 1.

The Abecedarian Early Childhood Intervention (1972-85) randomly selected 111 children from families with low socioeconomic background. The children were randomly assigned to a pre-k or to a control group. The program provided services to participants from birth through five years of age. Statistically significant benefits of the Abecedarian program include higher IQ test results, reduced special education placements, reduced grade retention, increased education attainment, increased employment in high-skilled jobs, and decreased marijuana use (Campbell et al. (2002)). Barnett and Masse (2007) found a benefit-cost ratio of 2.5 to 1 for this program.

As previously mentioned, due to difficulties in calculating the total benefits of pre-k, the monetary benefits in all the reported studies are very likely underestimated. Nonetheless, the majority of studies find a strongly positive benefit-cost ratio for pre-k programs. Taken together, the results of these benefit-cost analyses offer a compelling argument for increased public investment in pre-k programs. The research also shows positive returns from both targeted and pre-k-for-all programs. Although pre-k-for-all programs tend to have smaller benefit-cost ratios, the total benefits generated by these programs would be larger since more children are served.

Methodology and Assumptions

RESI calculated the benefits and costs of the proposed voluntary pre-k-for-all program using methodological techniques found in Lynch (2007) and Karoly and Bigelow (2005) with Maryland-specific cost and benefit data. Detailed below are the assumptions used to generate the estimated costs and benefits used in RESI's analysis. The costs of the program are fairly straightforward and consist primarily of the operating and administrative costs. Moreover, the costs are immediate unlike the benefits most of which accrue after the child has left the program and are, in some cases, less tangible than the costs. The benefits, however, do accrue to society over the lifetime of the student.

Cost

To determine the estimated cost of a one-year pre-k program, the number of four-year olds who would likely enroll in the program needed to be estimated. RESI assumes enrollment in the

voluntary pre-k-for-all program would be 70 percent of all children.⁴ Using projected population growth rates and data on the population of four year olds from the Child Care Demographics Report by Maryland Childcare Resource Network (2007), the study estimates 2009 enrollment in the proposed pre-k program of 52,294 four year olds.⁵

The program is assumed to operate three hours per day, 175 days during the academic year for a total of 525 hours per year. Therefore, for every 120 students enrolled, the program would offer two daily sessions in three classrooms, each with 20 children.

The program would feature a children-to-staff ratio of 10 to one.⁶ Thus, for every 120 children enrolled, the program will need three lead teachers (one per classroom including one who also serves as a site supervisor), four assistant teachers (one per classroom plus one to be used where needed) and the services of substitute teachers (720 hours). In addition, for every 120 enrollees, the program will also need a 0.15 full-time equivalent of a director, accountant, education specialist, and enrollment specialist.

The salaries for teachers are assumed to be comparable to the current salaries for Maryland kindergarten teachers and the employee benefits are assumed to be 33.6 percent of earnings. Non-personnel costs are assumed to be 37 percent of total costs.⁷

Figure A Estimated Cost of a One-year, Voluntary Pre-K-for-All Program for Four Year Olds (in 2007 dollars)

Category	Costs	
	2009 Total cost	Per child cost
Instructional staff:		
Lead teachers (3 for 120 students)	\$67,915,239	\$1,299
Assistant teachers (4 for 120 students)	\$37,565,815	\$718
Substitute teachers (720 hours per 120 children)	\$3,521,795	\$67
Administrative staff:		
Director (0.15 FTE for 120 students)	\$4,931,312	\$94
Accountant/bookkeeper (0.15 FTE for 120 students)	\$3,608,829	\$69
Education specialist (0.15 FTE for 120 students)	\$3,888,480	\$74
Enrollment specialist (0.15 FTE for 120 students)	\$3,207,663	\$61

⁴ The assumption of a 70 percent enrollment rate is based on Karoly and Bigelow (2005) and supported by Oklahoma pre-k enrollment rates. We assume that Head Start and special education enrollment in Maryland will remain at current levels (6 percent and 5 percent of four year olds respectively).

⁵ 2009 is the year estimated by the Maryland State Department of Education when pre-k for all in Maryland could begin operating.

⁶ Staffing assumptions follow Karoly and Bigelow (2005).

⁷ Assumption is based on the 37 percent ratio observed for Head Start (Golin et al (forthcoming)). The interviews with MD child care center directors show non-personnel costs of 20 percent - 25 percent (see section 3.0 “Center Directors” of this report). Karoly and Bigelow (2005) estimated non-personnel costs to be about 31 percent based on “occupancy costs from the capital investment associated with each classroom amortized over 30 years at 6 percent per year, plus an additional 2 percent per year of the total investment cost available for other classroom costs for equipment and supplies.” Since 37 percent is a very conservative estimate, transportation, health, nutrition, and other related services as needed could be budgeted under this category.

Total Salaries	\$124,639,134	\$2,383
Mandatory employee benefits (33.6% of cash earnings)	\$41,878,749	\$801
Non-personnel costs (37% of total costs)	\$97,796,217	\$1,870
Total Costs	\$264,314,100	\$5,054
Total Enrollment	\$52,294	
Total Cost per Child (09-10 cohort)	\$5,054	\$5,054

Based upon these assumptions and Maryland-specific data, the 2009 annual per-child cost of this program is \$5,054 (in 2007 dollars) compared to \$6,417 (in 2007 dollars) estimated by Lynch (2007) or \$6,366 (in 2007 dollars) estimated by Karoly and Bigelow (2005).

To provide the cost of funding a pre-k-for-all program net of current spending, existing local, state, and federal governments' funding streams for pre-k in Maryland should be subtracted from the total cost (see Figure B).⁸

RESI does not use current Head Start funds in the benefit-cost analysis and assumes that 6 percent of four year olds will continue to be enrolled in Head Start. Currently, federal funding for Head Start in Maryland totals \$77.2 million, and 51 percent of Head Start enrollees in the state are four years old. Including Head Start funds in the model is complicated by different durations (hours per day, days per year) of the Head Start programs. The question of collaboration with Head Start and using Head Start funds for the proposed pre-k-for-all program will require federal-state agreements at the discretion of state policymakers. Head Start would continue to serve, in conjunction with the voluntary pre-k-for-all program, disadvantaged children who need extensive year-round pre-k education.

Figure B Estimated Cost of a One-Year Voluntary Pre-K for All Four-year Olds Net of Current Spending⁹ (in 2007 dollars)

Category	Funding (2009)	Per Capita (2009)
Total Cost	\$264,314,100	\$5,054
less current State spending	\$44,074,663	
less current Local spending	\$63,871,228	
Total costs of pre-k net of current spending	\$156,368,209	\$2,990

⁸ Current spending on publicly funded pre-k in Maryland includes federal spending (around \$7 million in 2007 dollars), which consists of Title I funds. These funds might not be available for the purposes of pre-k for all in Maryland, so they were not included in the analysis.

⁹ RESI assumed no increases in funding from 2005-06 spending. Since only one percent of three year olds are enrolled in the current publicly funded pre-k program, (National Institute for Early Education Research, 2006 State Preschool Yearbook) the total amount for each funding stream was used in calculations.

Benefits

The benefits of a voluntary pre-k-for-all program range from lower grade repetition to higher lifetime earnings for the student. RESI followed the methodology of Lynch (2007), Karoly and Bigelow (2005) and others and where appropriate used Maryland-specific data. In the cases where Maryland-specific data were not available, national averages were used. RESI has enumerated the methodological techniques and data sources for each of the benefits typically associated with a voluntary pre-k-for-all program in Figure C.

Figure C¹⁰ Estimates for Voluntary Pre-K Benefits (Costs)¹¹, in 2007 dollars

Source of Benefits (Costs)	Impact	Per-child cost	Age applied ¹²
Grade repetition	-15.40%	\$10,123.51	17
Special education use (years)	-0.7	\$11,862.82	5 to 17
Higher educational attainment (years)	0.33	(\$10,123.51) ¹³	17
Child welfare system	-5.30%	\$27,929.69	3 to 17
Tangible costs to abuse victims	-5.30%	\$6,113.09	3 to 17
Intangible costs to abuse victims	-5.30%	\$52,306.00	3 to 17
Juvenile justice system (petitions)	-0.33	\$10,580.09	14
Tangible and intangible cost to juvenile crime victims (petitions)	-0.33	\$47,610.41	14
Value of child care (hours)	525	\$3.55	3 to 4
College education	11.20%	(\$13,410.95)	18 to 22
Compensation and Taxes:			
a) Increased labor force participation of guardians (elasticity)	0.2	\$34,175.00	3 to 4
b) Educational attainment on the part of participants	11.20%	\$30,601.60	18 to 65
Adult justice system (petitions)	-0.26	\$6,817.96	18 to 44
Tangible and intangible cost to victims of adult crime (petitions)	-0.26	\$30,680.84	18 to 44

Grade Repetition

The Chicago Child-Parent Centers (CPC) program reduced the incidence of grade repetition by 15.4 percentage points. Maryland data was used to calculate per year and per pupil costs of K-12 education. It is assumed that only one grade is repeated on average. The savings from reduced grade repetition are applied at age 17 and are split between the state and federal governments according to 93.8 percent and 6.2 percent shares as indicated in the Maryland State Department of Education report, “Calculated Current Expense Per Pupil Belonging Cost by State, Local, and Federal Sources – Fiscal Years 2002 through 2004.”

¹⁰ The impact of high-quality pre-k reported in Figure C is based on findings from the Chicago Longitudinal Study (CLS). Since the CPC program only enrolled disadvantaged children, and the Chicago Longitudinal Study’s (CLS) control group was not (for the most part) enrolled in pre-k, two adjustments were needed to calculate the benefits of a voluntary pre-k-for-all program. The first adjustment corrects for the fact that benefits of pre-k programs will likely accrue more to disadvantaged children (high risk) and less to more-advantaged children (medium and low risk). The second adjustment fine-tunes the benefits to account for the high number of Maryland children already enrolled quality public or private pre-k. The additional benefits from a high-quality pre-k will be lower for these children than for children not enrolled in any type of pre-k (see discussion and methodology below in the section “Adjustment for Income Distribution and Previous Preschool Attendance”).

The adjustments discussed above apply to all categories of benefits excluding value of child care and increased labor force participation of guardians. The value of child care, as well as net earnings/compensation and taxes on earnings for parents of participants are adjusted by a different factor than other benefit categories. These benefits are assumed to accrue only for children who do not currently attend public pre-k.

¹¹ The average participation in the CPC program lasted 1.5 years. However, the impact for children participating for one year was very similar to children participating for two years (Reynolds et al., 2002).

¹² The child’s age or age range at which the researcher examined the impact/savings.

¹³ Costs are shown as negative numbers in parentheses.

Special Education Placement

CPC participants required 0.7 fewer years of special education when compared to the control group. The cost of special education is calculated using the ratio 1.17 of the cost of special to regular K-12 education in 1999-2000 reported for Maryland by Augenblick and Myers (2005). The savings from reduced special education placements are applied between ages five and 17. To apportion the savings between the state and federal governments, the same shares are used as were applied to grade repetition.

Higher Educational Attainment

Total schooling was 0.33 years greater among the CPC participants than in the control group. The resulting additional costs to education systems was applied at age 17 and split between the state and federal governments according to 93.8 percent and 6.2 percent shares.

Child Welfare

The reduction in child maltreatment was 5.3 percent for CPC participants. The number of abused and neglected children in Maryland in 2004 was taken from the U.S. Department of Health and Human Services (DHHS) report. The cost of child welfare system per victim of maltreatment was calculated by using data on Maryland spending on child welfare system in 2000 from Bess, Andrews, Jantz, Russell, and Green (2003). The tangible and intangible costs of child abuse and neglect were calculated by using per-child estimates from Miller, Cohen, and Wiersema (1996). The savings were applied from ages three through 17 of pre-k participants. All savings were applied to Maryland state and local governments.

Juvenile Crime

The number of juvenile petitions was 33 percent lower by age 18 among CPC participants than in the control group. The estimated cost of a juvenile petition in Maryland is based on the disposition of petitioned cases, a national average cost for all petitioned cases (Greenwood et al 1994), cost of juvenile probation (Miller, Fisher, and Cohen 2001), and the cost of California incarceration facilities. According to Karoly and Bigelow (2005), the 2003 cost of a juvenile petition was \$9,480. This figure was adjusted to reflect 2007 dollars. RESI used data from Miller, Cohen, and Wiersema (1996) to calculate the tangible and intangible costs for victims of juvenile crime. The savings due to lower juvenile petitions and crime were then apportioned between state and federal governments and applied at age 14 (the mean age of arrest for juveniles).

Value of Child Care

The value of child care, which is a monetary subsidy from the state, is received by participants of the pre-k program. For the purposes of determining the value of child care, it is assumed that the voluntary pre-k program will run for 525 hours per year. The average cost of child care in Maryland is based on data from the Child Care Demographics Report by Maryland Childcare Resource Network (2007). Participants who would have enrolled in a public pre-k program in the

absence of pre-k for all do not receive the subsidy in our analysis. The savings are applied to the pre-k participants.

College Education

CPC participants' high school graduation rate was 11.2 percent higher than the control group's. Based on these results and on Karoly and Bigelow (2005), RESI assumed that high school graduates who had participated in pre-k would attend, on average, 1.5 years of postsecondary education. The estimated cost of the additional postsecondary education was calculated using Maryland enrollment-rate data and the current-fund revenue by source of funds in Maryland public degree-granting institutions (Digest of Education Statistics, Institute of Education Sciences (2005)). The costs of higher college attendance were applied to participants aged 18 through 22 and apportioned between state government, federal government, and participants according to their shares in the current-fund revenue of Maryland's public degree-granting institutions.

Compensation and Taxes

Greater high school graduation rates will lead to higher lifetime earnings for participants and increased income tax revenue for the government. RESI used the U.S. Census Bureau's 2005 earnings data for workers 25 years old and over to calculate the average per-year increase in earnings due to high school graduation. RESI applied tax rates for the middle quintile of income earners drawn from data by the Center on Budget and Policy Priorities (2002) and the Institute for Taxation and Economic Policy (2003) to calculate increased federal and state income tax revenues, including 16.3 percent federal income tax, 15.3 percent FICA tax, and 8.8 percent Maryland state income tax. Increased earnings and tax revenues were applied to participants aged 18 through 65.

Increased Labor Participation

RESI calculated increased labor participation of participants' guardians due to the free child care provided by the pre-k program. RESI assumed that the voluntary pre-k program will be scheduled for 525 hours per year and therefore will provide a child care subsidy of about 25 percent. The participants who would have enrolled in a public pre-k program in the absence of the pre-k for all do not receive the subsidy in our analysis. The population of Maryland three and four year olds and the proportion of children who would have enrolled in pre-k in the absence of pre-k for all are projected for the year 2007 using data from Maryland Childcare Resource Network (2007).

The percentage point increase in labor-force participation of guardians for a given reduction in child care costs is about 0.2 or more (Bartik 2006, Blau 2001, Blau and Hagy 1998, Anderson and Levine 2000). RESI assumed a more conservative estimation of elasticity equal to 0.2. The 2006 data from the Maryland Department of Labor, Licensing, and Regulation (DLLR) on median wages was used to calculate the increase in earnings due to increased labor participation. Tax rates for the middle quintile of income earners were drawn from Center on Budget and Policy Priorities (2002) and Institute for Taxation and Economic Policy (2003) and used to calculate increased federal and state income tax revenues, including 16.3 percent federal income

tax, 15.3 percent FICA tax, and 8.8 percent Maryland state income tax. The benefits of increased labor participation were applied to households with participants ages three through four.

Adult Crime

To calculate the savings from reduced adult crime, RESI employed assumptions from Reynolds et al. (2002) and Karoly and Bigelow (2005) that the effect on adult crime is 80 percent of the effect on juvenile crime for CPC participants. RESI drew Maryland data on adult arrests from Snyder, Puzanchera, and Kang (2005) and Maryland data on total justice system expenditures from the Expenditure and Employment Statistics Report for 1982-04 by Bureau of Justice Statistics. To calculate costs to the justice system of adult crime, RESI subtracted the previously calculated juvenile justice system expenditures from total justice system expenditures. The tangible and intangible costs for victims of adult crime were calculated using data from Miller, Cohen, and Wiersema (1996).

According to Lynch (2007), the peak of criminal activity occurs at age 18, and criminal activity decreases by 10 percent each following year. RESI applied this assumption and estimated the savings from reduced adult crime for participants ages 18 through 44. The savings were apportioned among state, local, and federal governments according to their shares in total expenditures on the Maryland justice system.

Adjustment for Income Distribution and Previous Pre-K Attendance

Since CPC only enrolled disadvantaged children and the Chicago Longitudinal Study's (CLS) control group were not (for the most part) enrolled in typical early care programs in low-income neighborhoods, two adjustments were needed to calculate the benefits of a voluntary pre-k program. The first adjustment corrects for the fact that the benefits of pre-k will likely accrue more to disadvantaged children (high risk) and less to more-advantaged children (medium and low risk). The second adjustment fine-tunes the benefits to accommodate for the high number of Maryland children already enrolled in a public or private pre-k, so the additional benefits from high-quality pre-k will be lower for them than for children not enrolled in any pre-k.

For the analysis of a one-year pre-k program, RESI followed assumptions by Karoly and Bigelow (2005) regarding income distribution and previous pre-k attendance. The distribution of the benefits is based upon whether a child is of high, medium, or low risk. The determination of risk was assigned by examining the effective buying income distribution in Maryland (Maryland Child Care Resource Network, 2007). RESI estimated the percentage of high-risk children in the total Maryland population at 28 percent, medium risk at 49.4 percent, and low risk at 22.6 percent. (These estimates are very close to estimates by Lynch (2007).)

It is further assumed that enrollment in the pre-k-for-all program would be 70 percent of all children. Of the children enrolled in a voluntary, publicly funded pre-k program, 21 percent would otherwise not have gone to any type of pre-k, 31 percent would have gone to another public program, and the balance would have gone to private child care. The distribution of

benefits to participants is based upon whether or not they would have attended pre-k (private or public)¹⁴ in the absence of a pre-k-for-all program.

Putting these two adjustments together, it is assumed that children who otherwise would not have gone to any type of pre-k receive the highest percentage of the benefits from the program (high risk group receives 100 percent, medium risk: 50 percent, low risk: 25 percent). Children who otherwise would have gone to either a public or private pre-k receive fewer additional benefits (high risk: 50 percent, medium risk: 25 percent, low risk: 0 percent). As a result, the benefits received by the average participant from the proposed pre-k-for-all program are estimated to be about 36 percent of CPC benefits.

Summary of Benefit-Cost Analysis Findings

RESI completed two types of benefit-cost analyses. The first is a per-child net present value (NPV) analysis, and the second is a total costs and benefits analysis for the years 2009 to 2052.

The NPV analysis allows an investor or a policymaker to consider the time value of money, i.e., it helps to find the present value in “today’s dollars” of the future net cash flow of a project. The present value of the future net cash flow can then be compared with the amount of money needed to implement that project. The benefits of the pre-k program will continue to accumulate over a long period of time. Monetary benefits received in the future are typically considered less attractive than the same monetary benefits received in the present. Similarly, future costs are considered less burdensome than the same costs accrued at the present time. Consequently, for the NPV analysis, RESI calculated the present value of all monetary benefits generated by one cohort of children participating in the program and compared them with the present value costs of the program using a somewhat conservative 6 percent discount rate.¹⁵

The costs and benefits calculated in the 2009-52 analysis are estimated as yearly flows over time assuming that the proposed pre-k program will start in Maryland in 2009 and continue running in the future. For each year in the period from 2009 to 2052, RESI calculated the benefits and the costs related to the current year’s program participants and all previous participants, taking into account changes in population and enrollment in the program. The results for the year 2052 reflect a comparison of costs incurred in that year with benefits generated in that year.

One-year, high-quality, voluntary pre-k for all

Assuming that the high-quality, one-year, voluntary pre-k program is available to all four year olds in Maryland, enrolling 52,294 children in 2009, Figure D illustrates that the total offsetting *government budget* (federal, state, and local) benefits (i.e., not including benefits to individuals, such as increased earnings) would exceed costs in 10 years. By the year 2052, the last year

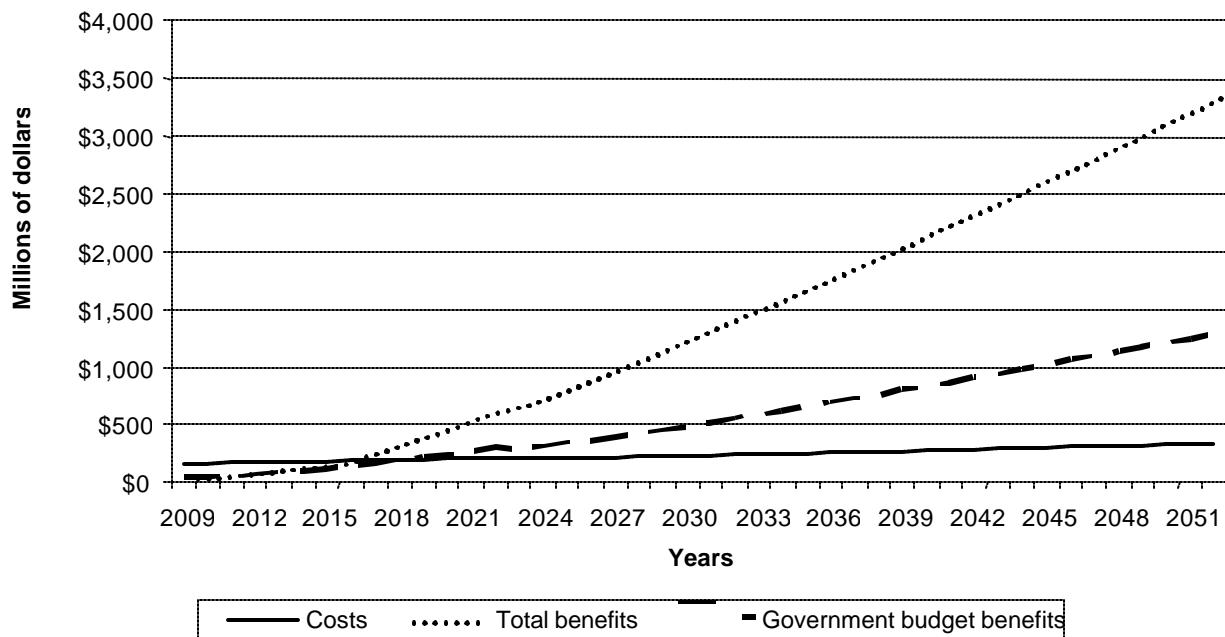
¹⁴ While RESI treated current publicly funded pre-k and private child care programs similarly in this analysis, private child care that most parents can afford is most likely of lower quality than public programs. In this case, the total benefits received by Maryland children due to introduction of pre-k for all will be higher. Therefore, findings in this report are a conservative estimate.

¹⁵ Discount rates used for evaluation of public policy projects typically range from 3 to 6 percent per year in real terms. A 3 percent discount rate was used by Karoly and Bigelow (2005) and Reynolds et al. (2002), while Barnett (1993) used a 5 percent discount rate.

estimated, the net budgetary surplus (federal, state, and local combined) would total \$956 million with \$541 million in Maryland state and local net budgetary surplus. In the year 2052 every dollar spent on the program would return \$4 in government budget savings, \$2.7 of which would go to Maryland taxpayers.

Increased compensation net of taxes for participants of the program and their guardians in the year 2052 would total \$1.38 billion. Savings to individuals from reduced crime would be \$625 million. When including these benefits to individuals, the total benefits from a pre-k-for-all program in Maryland would exceed the costs of the program by 2012 and total as much as \$3.5 billion by the year 2052. A pre-k-for-all program in Maryland would result in a 10.5 to 1 benefit-cost ratio for U.S. society as a whole and an 8.3 to 1 benefit-cost ratio for Maryland society as a whole.

Figure D One-Year, Voluntary Pre-K for All Costs and Benefits, 2009-2052
(In millions of 2007 dollars)



The results of the per-child net present value analysis are summarized in Figure F. Costs and benefits are calculated relative to a baseline of status quo in Maryland. For example, RESI accounts for the fact that Maryland is already funding a pre-k program as well as the fact that some Maryland children are already enrolled in either public or private pre-k programs. Consequently, in Figure F, marginal costs are compared to marginal benefits. Rows in Figure F show costs (negative numbers given in parenthesis) and benefits (positive numbers) resulting from introduction of a one-year pre-k-for-all program. The recipients of benefits, shown in the columns of Figure F, include Maryland state and local governments, federal government, participants of the pre-k program and their guardians, and other Maryland residents. The rest of Maryland society would receive spillover benefits from the pre-k program in the form of reduced juvenile and adult crime. The last two columns of Figure F show the total benefits for Maryland

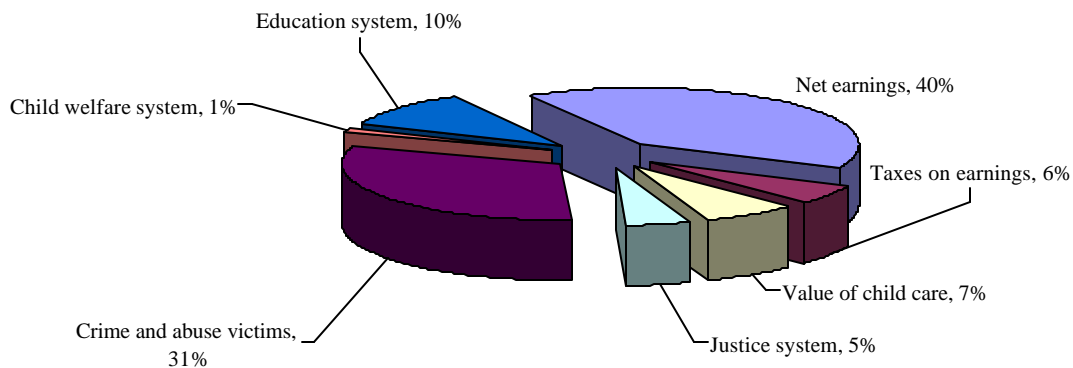
society as a whole (benefits to the federal government are excluded) and the total benefits for U.S. society as a whole. The last three rows of the Figure show total benefits, net benefits (total benefits minus costs), and the benefit-cost ratio (total benefits divided by costs).¹⁶

Given the current enrollment in pre-k programs, the additional benefits to Maryland society as a whole (Maryland residents and governments) from a high-quality, voluntary pre-k-for-all program would total \$14,506 in present value dollars per participating child. Given the current funding streams for pre-k, the additional program costs per child would equal \$2,990, giving the benefit-cost ratio of 4.85 to 1 for Maryland society. Using a more conservative approach and excluding intangible benefits (e.g., reduced pain and suffering to victims of crime and child maltreatment), the additional benefits from the program to Maryland society would equal \$10,501 per child enrolled, resulting in a benefit-cost ratio of 3.51 to 1.

For U.S. society as a whole, the additional benefits from the Maryland program would be even higher, totaling \$18,056 per participant, with a benefit-cost ratio of 6.04 to 1. The higher benefits for U.S. society versus Maryland society are mainly due to greater federal income tax and Social Security tax revenues from increased earnings of pre-k participants.

Benefits are distributed unevenly between the government, participants of the program, and the rest of Maryland society (see Figure E). The benefits to the public sector of Maryland society in the form of savings to the education, child welfare, and justice systems and to higher tax revenues are estimated to be roughly 23 percent of total benefits. Approximately 35 percent of total benefits would be realized by participants of the program in the form of higher earnings net of taxes and education costs, and nearly 12 percent of total benefits would be realized by guardians of participants in the form of value of child care and higher net earnings. Participants and the rest of society would realize the remaining 31 percent in the form of savings from reduced child maltreatment and crime.

Figure E Distribution of Present-Value Benefits for Maryland Society¹⁷



¹⁶ A benefit-cost ratio is not defined for stakeholders who do not accrue any costs.

¹⁷ Intangible benefits (e.g. reduced pain and suffering to victims of crime and child maltreatment) are included for the purposes of this graph.

As this report has attempted to show, even a conservative benefit-cost analysis of voluntary pre-k for all four year olds in Maryland indicates positive returns for Maryland state and local governments as well as the people of Maryland.

While net benefits are highest for stakeholders who do not accrue any costs, (i.e., participants of the program will gain the most) the rest of Maryland society and the federal government will also benefit. Net benefits are positive, but lower for Maryland state and local governments (\$288 in present value dollars per participating child), since they are assumed to bear the full additional costs of the program. Importantly, however, the benefits in this analysis are most likely underestimated (see discussion in the above literature review). The RESI study shows the internal rate of return (IRR) for the government (federal, state, and local combined) is 14 percent¹⁸ while for Maryland State and local government it is 8 percent. Pre-k for all is a public investment that will pay off in the future.

¹⁸ The internal rate of return (IRR) is the discount rate at which the net present value would be zero. The higher the IRR of a project, the more desirable the project is from an investor's point of view. When net benefits are positive, the IRR is higher than the discount rate.

Figure F Present Value Costs and Benefits for a One-Year Pre-K for All Program (in 2007 present value dollars per child)¹

Source of Costs or Benefits	G o v e r n m e n t				T o t a l S o c i e t y		
	Maryland State and Local	Federal	Total Government	Maryland Participants	Rest of Maryland Society	Maryland	Total U.S.
Program costs	(\$2,990)		(\$2,990)			(\$2,990)	(\$2,990)
Program benefits							
Education outcomes							
Grade retention	\$233	\$15	\$248			\$233	\$248
Special education	\$1,949	\$129	\$2,078			\$1,949	\$2,078
Educational attainment	(\$498)	(\$33)	(\$531)			(\$498)	(\$531)
Child welfare outcomes							
Child welfare system costs	\$211	\$263	\$474			\$211	\$474
Costs to victims of maltreatment (tangible)				\$86		\$86	\$86
Costs to victims of maltreatment (intangible)				\$733		\$733	\$733
Juvenile crime outcomes							
Justice system costs	\$513	\$111	\$624			\$513	\$624
Costs to victims of juvenile crime (tangible and intangible)					\$2,807	\$2,807	\$2,807
Value of child care				\$1,025		\$1,025	\$1,025
College attendance	(\$140)	(\$39)	(\$179)	(\$64)		(\$203)	(\$243)
Labor market earnings							
Net earnings/compensation for participants				\$5,083		\$5,083	\$5,083
Taxes on earnings for participants	\$751	\$2,695	\$3,446			\$751	\$3,446
Net earnings/compensation for guardians of participants				\$709		\$709	\$709
Taxes on earnings for parents of participants	\$105	\$376	\$481			\$105	\$481
Adult crime outcomes							
Justice system costs	\$155	\$33	\$189			\$155	\$189
Costs to victims of adult crimes (tangible and intangible)					\$848	\$848	\$848
Total benefits	\$3,278	\$3,550	\$6,828	\$7,572	\$3,655	\$14,506	\$18,056
Net benefits	\$288		\$3,838			\$11,516	\$15,066
Benefit-cost ratio (\$/\$1)	1.10		2.28			4.85	6.04

Introduction to Childcare and Pre-k Funding

Throughout the nation and Maryland, support for a high-quality pre-k education is on the rise among individuals, communities, and political leaders. The benefits of a high-quality pre-k education have been enumerated in previous sections of this report as well as in numerous other studies.

Missing from many of these studies, however, are practical discussions of how to finance a high-quality pre-k program, especially in an era of cuts in government spending. Making the political decision to support a pre-k program even more difficult is that while the costs of such a program are upfront and can be accurately enumerated, the immediate benefits are less tangible and slower to surface. Nevertheless, as detailed earlier in this report, it is clear that the long-term benefits of such a program outweigh the short-term costs. This section examines funding options for this type of program by citing models from other states as well as existing funding sources that could become the financial basis for this program.

Funding a voluntary pre-k program in the State of Maryland will require substantial capital, both at the start of the program as well as in future years. As the program expands, more funding will be needed to keep it running smoothly and to maintain the required standards of excellence.

Funding a pre-k program with existing or new funding sources presents numerous issues that need to be weighed. Likewise the choice between using a single source of funding or multiple funding sources must be carefully considered. A reliance on any one funding source can be detrimental to the expansion of any early education program, while a highly fragmented funding structure can also present challenges to management and growth.

Currently, funding for child care, early education, and staff development comes from a variety of sources such as federal, state, local, private, and public entities. Funding mechanisms are equally varied and are administered in the form of vouchers, tax relief, direct funding, and reimbursements. As a result, statistical information on funding is not readily available or easy to navigate. According to Barnett and Masse (in press), statistical information for childhood education and care is “fragmented, inconsistent, and inadequately funded.” The lack of comprehensive and current funding information, particularly at the state level, presents a particular challenge when trying to analyze the availability of possible funding streams for the purpose of a state pre-k-for-all program. In order to develop a successful financing strategy, it is important to have a thorough knowledge of all existing funding systems while keeping a pulse of the political climate that may affect funding decisions.

Maryland Current State and Federal Funding System

Below are listed the federal, state, and other financing programs that may enable Maryland to implement and expand a voluntary pre-k-for-all program.

There are four state-funded initiatives that provide financing of pre-k programs:

- State Pre-kindergarten, formerly Extended Elementary Education Program (EEEP) (funds were redirected to state aid),

- Pre-k Special Education Services (state funds), and
- State Aid to Education.

There are five major federal initiatives that provide funding for a pre-k program:

- Child Care Development Funds (CCDF) and Temporary Assistance to Needy Families (TANF) Funds,
- Head Start,
- Title I - Elementary and Secondary Education Act (ESEA),
- Tax Policy, i.e., Child Care Tax Credit, and
- Individual Disabilities Education Act (IDEA)

Figure G Federal and State Early Care and Education Funding in Maryland (Fiscal Year 2007)

Child Care and Development Fund (CCDF)	
Federal Expenditure	\$80,644,227 ¹⁹
State Expenditure	\$54,943,243
Temporary Assistance for Needy Families (TANF)	
TANF – Transfer to CCDF	\$10,285,667
Head Start	
Federal Allocation	\$77,277,126
State Supplemental	\$3,000,000
Targeted Pre-k (State Aid)	\$84,584,797 (FY08 projected)
Judith P. Hoyer Early Care and Education Enhancement Program²⁰	\$10,575,000

Child Care and Development Fund (CCDF)

Child Care and Development Funds (CCDF), authorized under the Personal Responsibility and Work Opportunity Act of 1996, provide the largest share of dedicated federal funding for child care expenses. Yearly funding for each individual state is formula based and includes mandatory, matching, and discretionary funding. Federal funds require state matching funds as well as maintenance of effort funds (MOE).

Below is a summary of some of the CCDF requirements:

¹⁹ CCDF Federal expenditure includes Mandatory, Matching, and Discretionary funding streams.

²⁰ This Program is state-funded and promotes quality initiatives for early care and education programs in support of school readiness. A total of 24 Judy Centers, partnerships between public schools and early care programs to provide comprehensive early childhood services are funded out of the Program.

- At least four percent of funds are used to provide quality child care and eligibility for all children;
- At least 70 percent of the state’s mandatory and matching funds must be used for families receiving TANF, transitioning to TANF, or at risk of becoming eligible for TANF;²¹ and
- By statute, states must give priority to children with “special needs” and to children from “very low-income” families.²²
- States can also give priority to other categories of children.

According to CCDF regulations, to be eligible for these funds, children must meet the following requirements:

- The child must be under 13 years of age;
- The child must reside with a family whose income does not exceed 85 percent of state median income (SMI). There are case-by-case exceptions for families receiving or needing protective services;
- The child must either
 - a) Reside with a parent who is working or attending a job training or educational program; or
 - b) Receive, or need to receive, protective services; and
- The child must be a citizen of the U.S. or meet certain legal residency requirements.

Temporary Assistance for Needy Families (TANF)

The Temporary Assistance for Needy Families (TANF) block grant structure was created by Congress in 1996. Due in part to recent legislation, the use of TANF funds has become more flexible. Certain guidelines have been expanded to allow states the opportunity to develop and implement innovative strategies that remove families from the cycle of dependency on public assistance and into the workplace. While TANF funds are primarily required to be used for people who are receiving TANF cash assistance, states have discretion in the use of TANF funds in any manner "reasonably calculated to accomplish the purposes of TANF".

The purposes are:

- Assisting needy families so that children can be cared for in their own homes;
- Reducing dependency of needy parents by promoting job preparation, work, and marriage;
- Preventing out-of-wedlock pregnancies; and
- Encouraging the formation and maintenance of two-parent families.

Furthermore, as it applies to child care spending, states may use their funding in the following ways:

²¹ Although many states categorize “at risk” as “low income”, states have flexibility in defining the term.

²² States have flexibility in defining “special needs” and “very low income”

- Up to 30 percent of TANF funds can be transferred to CCDF; and
- Unless otherwise prohibited, states can use funds in any manner that accomplishes the purpose of TANF.

One particular study, Greenberg and Schumacher (2003), investigates the possibility of using existing federal funds for a state pre-k-for-all initiative. The study outlines the requirements of CCDF as well as TANF funds and profiles circumstances in which states could use these streams to fund a pre-k-for-all program.

CCDF cannot be used for the daily costs of child care for all children; a state may, however, use funds, under a quality improvement set-aside, to pay for costs related to helping a pre-k-for-all program meet and maintain state standards or to perform activities that improve the quality of child care. These expenditures are not limited to CCDF-eligible children as they can provide benefit to all. TANF, when combined with CCDF, takes on the requirements of CCDF.

According to the authors, when it comes to using funds for financing pre-k for all or a specific center, there are some activities that can be funded, including:

- Making grants or providing loans to child care providers so that they can meet applicable state and local child care standards;
- Improving the monitoring compliance with and enforcement of applicable state and local requirements;
- Providing training and technical assistance in areas that benefit child care services such as first aid and nutrition; and
- Improving salaries and fringe benefits for staff that provide services.

As applied to the charges given to the Task Force, MSDE's Division of Early Childhood Development, has already been redirecting funds to improve the overall quality of child care providers, including the following:

- Grants to child care organizations to provide training and professional development to child care providers;
- Funding of the Maryland Child Care Credentialing Program;
- Incentive grants for providers to purchase educational materials and curricular resources;
- Grants to provide services for children with disabilities in child care;
- Funds for the Maryland Career and Professional Development Fund which is designed to provide scholarships for early educators to pursue a postsecondary degree in early childhood education or related field; and
- Funds to assist child care programs in pursuing national or state accreditation.

These funding strategies are directly in support of the Task Force charges in terms of quality improvement and professional development. In addition, the Judith P. Hoyer Early Care and Education Enhancement Program includes state funding for professional development and program accreditation, which could support expansion of the pool of eligible programs and qualified personnel.

Head Start

Head Start provides comprehensive early education services to low-income children. Services are not only limited to education but include a comprehensive approach to learning by incorporating parent involvement and providing social assistance. However, since Head Start regulations require that 90 percent of participants come from low-income families, the services of Head Start are limited to a small percentage of children. Currently, the majority of Head Start programs in Maryland are administered by nonprofit community-service agencies.²³ Head Start is a matching program in which grantees must contribute 20 percent of the total cost. In addition, the state provides \$3 million in supplemental funding for Head Start to provide extended hours of services and to improve the quality of programs.

In order to leverage limited and targeted Head Start funds, collaboration between a pre-k-for-all system and Head Start can be beneficial to both programs. The integration of these two programs can:

- Reduce capital expenses by utilizing already existing infrastructure;
- Incorporate half-day pre-k learning services with full-day Head Start services;
- Increase the compensation and qualifications of Head Start teachers;
- Coordinate the enrollment, service, and parental support for low-income children; and
- Utilize a community-based approach to pre-k instruction.

Since 2004, local school systems and local Head Start grantees have established formal Memoranda of Understanding to coordinate services for low-income children, especially the transition from Head Start to public school pre-k. In 2006-07, more than 4,000 four year olds were served by Head Start but were not considered part of pre-k unless the Head Start program was operated by the local school systems (i.e., Prince George's and Montgomery Counties).

Tax Policy

Currently two federal tax instruments can be applied to child care expenses: the Dependent Care Tax Credit and Dependent Care Assistance Program (DCAP). These programs assist families with the expense of child care, but their usefulness is greatest for middle- and upper-income families since they provide relief primarily for those with income tax liability.

- Maryland allows a Dependent Care Tax Credit equal to as much as 32.5 percent of the Federal Child and Dependent Credit, depending on income, for child care expenses for children through age 12 or for day care expenses for disabled spouses or dependents. In addition, the state allows a deduction of \$2,400 for one dependent and \$4,800 for two or more.
- DCAP is a benefit that allows active employees to deposit money into an account on a pre-tax basis to use for dependent or elder care expenses up to \$5,000 per year.

An alternative to using federal funds to finance a pre-k-for-all program is to rely on state budget appropriations. States have more flexibility when developing their own programs to use funding

²³ Prince George's and Montgomery public schools are providing Head Start services

strategies that build on currently available federal programs. The structure of a state-funded pre-k program financed through general revenues can enhance the comprehensive ness and stability of a pre-k-for-all initiative. States can also use a variety of tax mechanisms to fund pre-k.

State Pre-K (formerly Extended Elementary Education Program (EEEP))

Since 1980, Maryland has gradually expanded its pre-k program. Until 2007, local school systems received a formula-driven discretionary EEEP grant from the state. In FY08, \$19.2 million was incorporated in the Compensatory Fund of the state aid allocation under the Bridge to Excellence in Public Schools Act. Thus, local school systems now use state aid and local education funds to provide pre-k to all four-year olds from “economically disadvantaged backgrounds,” that is, families with incomes below 185 percent of the federal poverty threshold. In school year 2006-07, more than 25,000 four year olds were enrolled in pre-k in Maryland. All pre-k programs are operated by local boards of education. In a few instances, local boards collaborate with child care providers to operate pre-k.

Maryland's Child Care Subsidy Program (formerly Purchase of Care)

The state’s child care subsidy program is funded with state and federal funds. The program provides vouchers to assist parents or guardians in job training or school as well as those from low-income families with the costs of child care. After obtaining a voucher, families select a child care provider (i.e., center, family child care home, or an informal provider), and cover the cost of care by using the voucher (as subsidy) and a specified co-payment. Currently, only 45 percent of all providers charge the predetermined rate of care, while 55 percent of the providers charge families the difference between the actual cost of care and the state’s predetermined rate.

Judith P. Hoyer Early Care and Education Enhancement Program

Named for the late Judy P. Hoyer, a renowned early childhood educator from Prince George’s County, this program comprises a number of initiatives including 24 Judy Center sites, funds for professional development related to the Maryland Model for School Readiness (MMSR), funds for program accreditation, and grants for local school systems to operate a pre-k program in collaboration with a child care center. The program’s \$10.6 million are intended to improve the quality of early childhood programs through partnerships among existing early care and education programs.

Maryland State Loan Guarantee

Under Maryland’s State Loan Guarantee program, the state insures up to 80 percent of loan principal for child care capital projects, providing much greater incentives for lenders to work with child care providers and offer reasonable interest rates. The state also uses appropriated general revenue to offer below-market-rate loans for up to 50 percent of the total cost of a facilities project with approximately \$2 million allocated for this purpose annually.

Examining Other Funding Streams

The volatility of federal and state funding has motivated many states to look for alternate ways to support a pre-k-for-all system. A successful financing strategy for any program will incorporate a

thorough review of other successful initiatives. There are several alternatives to relying only on state and federal funds. Below are few examples:

Dedicated Funding

A dedicated funding source is one, which by law is available only to support a specific initiative and cannot be diverted to other uses. A dedicated funding source can help alleviate some of the financial dilemmas of pre-k-for-all funding by generating new revenue streams to help with the inception and expansion of this type of initiative. Around the nation, many states have successfully found dedicated funding sources to fund pre-k programs. Some examples are outlined below:

- **Local Property Taxes:** A property tax is usually levied on the value of residential and commercial land and buildings. One way to generate funds is to increase the property tax and earmark the increase for pre-k. For example, in San Francisco, CA, a public referendum (Proposition J) enabled the city to appropriate a percentage of local property taxes for children’s services. The funds generated can be used for early childhood development, youth development, and family support.²⁴
- **Excise Taxes:** Typically taxes and fees on smoking appeal to the public more than an increase to state or property taxes. For example, tobacco taxes are usually enacted to account for the “social costs” of smoking. The federal government already imposes a tax on cigarette sales, but many states have added their own. For instance, Arizona’s Proposition 203 (Arizona Childhood Development and Health Initiative) established an early childhood and health fund, consisting of revenues generated by an increase in the state tax on tobacco products.²⁵
- **Fees:** The principal way for governments to raise revenue is through taxation, but they can also impose fees to generate funds. A fee is usually a payment in exchange for a service such as highway tolls or state park admission. In Kentucky, for example, the Motor Vehicle Registration Child Care Assistance Account gives the opportunity for any person requesting a certificate, registration, or renewal to donate to the account. Funds collected can be used for any type of regulated child care
- **Lottery/Gaming:** In Georgia, the lottery agency plays a significant role in providing funds for education. In 1995, using lottery revenues, Georgia became the first state in the nation to provide voluntary pre-k to all four-year-old children, regardless of family income. Georgia pre-k programs must be available for a minimum of six and a half hours a day, five days a week, for the 180-day school year (for details see Schumacher et al., 2001). Programs provide educational services through a mix of public and private settings that include elementary, secondary, and postsecondary schools; private and public colleges; hospitals; military bases; private child care learning centers; and Head Start sites.

²⁴ <http://www.earlychildhoodfinance.org/handouts/NACOarticle.pdf>

²⁵ <http://www.ncsl.org>

Innovative Approaches to Funding

There are several ideas for funding that have yet to be expanded or tested. These may present new funding streams for pre-k:

- **State Neighborhood Assistance Programs:** Maryland already has an established program that provides tax credits to businesses that contribute to community-based nonprofits. The Community Investment Tax Credit Program (CITC) is administered by the Department of Housing and Community Development and encourages contributions by private companies to a varied number of nonprofits in the state. Over the past ten years, the Community Investment Tax Credit Program has leveraged almost \$19.8 million in charitable contributions for 296 nonprofit projects. While contributions to child care and early childhood education establishments have been low, the tax credit can certainly be a useful source of funding for smaller community-based entities.
- **Tax Increment Financing (TIF):** TIF captures incremental increases in tax revenues without any required change in the tax rates. This type of financing has proven to be a highly successful development tool around the country. It hasn't, however, been thoroughly explored for the benefit of child care or early childhood education.
- **Foundation Programs:** The Minnesota Early Learning Foundation (MELF) issues grants to promising, high-quality demonstration programs and parent scholarships for families of pre-k-age children. It functions as an incorporated nonprofit organization in partnership with corporations, foundations, and the civic sector to foster school readiness.

APPENDIX A

Two-year versus one-year program

RESI reviewed two scenarios for the analysis of a two-year pre-k program for all three and four year olds. The first scenario uses Karoly and Bigelow (2005) assumptions regarding income distribution and previous pre-k enrollment, as does the analysis of a one-year pre-k program above. In addition, in order to explore the possible range of benefits received due to introduction of a two-year high-quality pre-k-for-all program; RESI's second scenario uses Lynch (2007) income distribution and previous pre-k enrollment assumptions. The Task Force recommendations did not include the concept of providing access to all three and four year olds.

For a two-year program for all three and four year olds, RESI assumed enrollment of three year olds will be the same as enrollment of four year olds. In the context of a benefit-cost analysis, this is a conservative estimate since the enrollment of three year olds will most likely be lower.²⁶ Projecting the enrollment of three year olds, however, is difficult since existing pre-k-for-all programs in Oklahoma, Florida, and Georgia enroll only four year olds. If indeed the enrollment of three year olds proves to be lower than that of four year olds, the total cost of the program will be lower and the benefit-cost ratios of the two-year program will be higher.

RESI assumed that benefits received by one cohort of children from a two-year pre-k-for-all program would be greater than the benefits received by that cohort from a one-year pre-k for all program.²⁷ This very conservative assumption will significantly lower benefit-cost ratios for the two-year program. This assumption reflects the limited availability of research on the differential impact from one-year pre-k programs versus two-year programs. Though some research suggests diminishing returns from a second year of pre-k (Reynolds et al., 2002), the recent study by Lamy, Barnett, and Jung (2005) of a New Jersey pre-k program indicates that a second year produces large effects on receptive vocabulary, print awareness, and math skills.

Finally, the total benefits accumulated from a two-year program in Maryland will be higher than those from a one-year program since the number of children served will be much higher.

Two-year program costs

The high-quality two-year pre-k for all three and four year olds in Maryland is estimated to enroll 104,587 children in 2009 and 105,809 children in 2010. The total costs of the two-year pre-k program are outlined in Table A1.

²⁶ The assumption of 70 percent enrollment of all eligible three and four year olds closely corresponds to the low-end estimate of 68 percent enrollment by Lynch (2007). His estimates are based on the ratio of .87 of three year olds to four year olds enrolled in private pre-k in the United States. Lynch used for his analysis an intermediate projection of 81 percent total enrollment of three and four year olds with the same ratio (0.87) of three year olds to four year olds.

²⁷ The exception is the value of child care and increase in guardian's labor participation. These two types of benefits will increase with a longer duration of the program since they do not depend on income distribution and previous pre-k attendance of participants' adjustments.

Table A 1 Estimated Cost of a Two-Year Voluntary Pre-K Program for All Three and Four Year Olds (in 2007 dollars)

Category	Costs			Per child per year cost
	2009	2010	Total cost	
Instructional staff:				
Lead teachers (3 for 120 students)	\$135,830,478	\$137,416,966	\$273,247,444	\$1,299
Assistant teachers (4 for 120 students)	\$75,131,629	\$76,009,161	\$151,140,790	\$718
Substitute teachers (720 hours per 120 children)	\$7,043,590	\$7,125,859	\$14,169,449	\$67
Administrative staff:				
Director (0.15 FTE for 120 students)	\$9,862,624	\$9,977,819	\$19,840,443	\$94
Accountant/bookkeeper (0.15 FTE for 120 students)	\$7,217,659	\$7,301,960	\$14,519,619	\$69
Education specialist (0.15 FTE for 120 students)	\$7,776,961	\$7,867,795	\$15,644,756	\$74
Enrollment specialist (0.15 FTE for 120 students)	\$6,415,327	\$6,490,257	\$12,905,584	\$61
Total Salaries	\$249,278,268	\$252,189,817	\$501,468,085	\$2,383
Mandatory employee benefits (33.6% of cash earnings)	\$83,757,498	\$84,735,779	\$168,493,277	\$801
Non-personnel costs (37% of total costs)	\$195,592,434	\$197,876,937	\$393,469,371	\$1,870
Total Costs	\$528,628,199	\$534,802,533	\$1,063,430,733	\$5,054
Total Enrollment	\$104,587	\$105,809	\$210,396	
Total Cost per Child (09-10 cohort)	\$5,054	\$5,054	\$10,109	\$5,054

For calculations of estimated cost net of current spending, RESI assumed that there are no planned increases in existing funding streams between 2009 and 2010 (Table A2).

Table A 2 Estimated Cost of a Two-Year Voluntary Pre-K Program for All Three and Four Year Olds Net of Current Spending (in 2007 dollars)

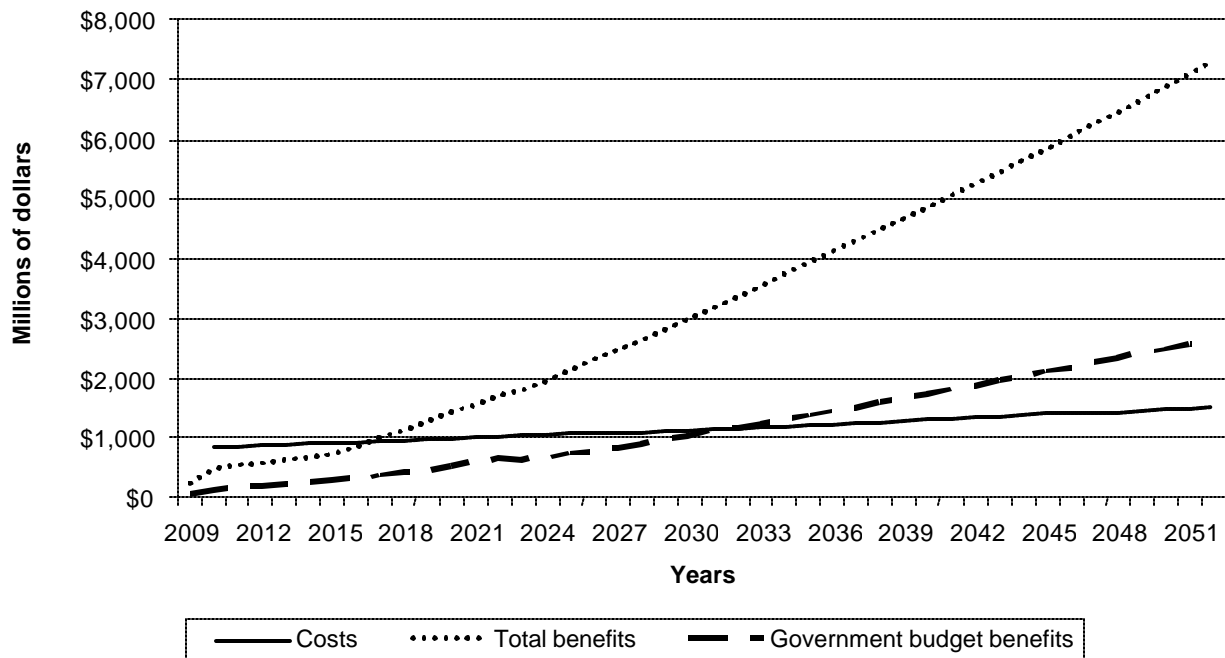
Category	Funding (2009)	Per Capita (2009)	Funding (2010)	Per Capita (2010)
Total Cost	\$528,628,199	\$5,054	\$534,802,533	\$5,054
less current state spending	\$44,074,663		\$44,074,663	
less current local spending	\$63,871,228		\$63,871,228	
Total costs of pre-k net of current spending	\$420,682,309	\$4,022	\$426,856,643	\$4,034

Two-year program benefit-cost analysis (first scenario)²⁸

The voluntary, two-year pre-k program for all three- and four-year olds in Maryland would enroll 104,587 children in 2009 and 105,809 children in 2010. The total offsetting *government budget* (federal, state, and local) benefits would exceed costs in 24 years (see Graph A1), while the Maryland state and local offsetting budget benefits would exceed costs in 36 years. By 2052, the last year estimated, the net budgetary surplus (federal and state combined) would total \$1.12 billion with \$267 million in Maryland state and local net budgetary surplus. In the year 2052 every dollar spent on the program would return \$1.7 in budget savings, \$1.2 of which would go to Maryland taxpayers.

Increased compensation net of taxes for participants of the program and their guardians in the year 2052 would total \$2.9 billion. Savings to individuals from reduced crime would be \$1.25 billion. Including these benefits to individuals, the total benefits of pre-k for all three and four year olds in Maryland would exceed the costs in eight years and would total \$7.3 billion by 2052. The benefit-cost ratio would be 4.8 to 1 for U.S. society as a whole and 3.3 to 1 for Maryland society as a whole in 2052.

Graph A 1 Two-Year Voluntary Pre-K for All Costs and Benefits, 2009-2052, First Scenario (in millions of 2007 dollars)



²⁸ This section uses Karoly and Bigelow (2005) assumptions regarding income distribution and previous pre-k enrollment, as does the one-year pre-k for all analysis in the main body of this report. It is assumed in the analysis that children who would otherwise not have gone to pre-k receive the highest percentage of the benefits (high risk group receives 100 percent, medium risk: 50 percent, low risk: 25 percent). Children who would otherwise have gone to pre-k receive fewer additional benefits (high risk: 50 percent, medium risk: 25 percent, low risk: 0 percent).

The results of the net present value analysis are summarized in Table A3. The program will generate \$20,155 total benefits per child enrolled in present value dollars, \$16,247 of which would go to Maryland society as a whole. Given the current funding streams for pre-k, the discounted additional program costs per child would equal \$7,828,²⁹ for a benefit-cost ratio of 2.57 to 1 for U.S. society as a whole and 2.08 to 1 for Maryland society. The IRR for U.S. society as a whole would be 19 percent.

According to the analysis summarized in Table A3, while pre-k for all three and four year olds in Maryland would yield a negative return in terms of government budget, it would more than pay for itself when the benefits to participants, their families, and residents are taken into consideration. As mentioned in the literature review above, the monetary benefits of the pre-k program are likely underestimated. Additionally, “investments in public education more generally are not necessarily justified because they generate net savings to any given level of government but because they generate positive net benefits for society as a whole” (Karoly and Bigelow, 2005).

²⁹ The discounted additional costs per-child (\$7,828) are calculated from 2009 and 2010 per-child costs net of current funding (table A.2) with 2010 costs being discounted to present value dollars.

Table A 3 Present Value Costs and Benefits for a Two-Year Pre-K-for-All Program, First Scenario, (in 2007 present value dollars per child)³⁰

Source of Costs or Benefits	Government Maryland State and		Total Government	Maryland Participants	Rest of Maryland Society	Total Society	
	Local	Federal				Maryland	Total U.S.
Program costs	(\$7,828)		(\$7,828)			(\$7,828)	(\$7,828)
Program benefits							
Education outcomes							
Grade retention	\$233	\$15	\$248			\$233	\$248
Special education	\$1,949	\$129	\$2,078			\$1,949	\$2,078
Educational attainment	(\$498)	(\$33)	(\$531)			(\$498)	(\$531)
Child welfare outcomes							
Child welfare system costs	\$211	\$263	\$474			\$211	\$474
Costs to victims of maltreatment (tangible)				\$86		\$86	\$86
Costs to victims of maltreatment (intangible)				\$733		\$733	\$733
Juvenile crime outcomes							
Justice system costs	\$513	\$111	\$624			\$513	\$624
Costs to victims of juvenile crime (tangible and intangible)					\$2,807	\$2,807	\$2,807
Value of child care				\$1,993		\$1,993	\$1,993
College attendance	(\$140)	(\$39)	(\$179)	(\$64)		(\$203)	(\$243)
Labor market earnings							
Net earnings/compensation for participants				\$5,083		\$5,083	\$5,083
Taxes on earnings for participants	\$751	\$2,695	\$3,446			\$751	\$3,446
Net earnings/compensation for parents of participants				\$1,384		\$1,384	\$1,384
Taxes on earnings for parents of participants	\$204	\$734	\$938			\$204	\$938
Adult crime outcomes							
Justice system costs	\$155	\$33	\$189			\$155	\$189
Costs to victims of adult crimes (tangible and intangible)					\$848	\$848	\$848
Total benefits	\$3,377	\$3,908	\$7,285	\$9,215	\$3,655	\$16,247	\$20,155
Net benefits	(\$4,451)		(\$543)			\$8,419	\$12,327
Benefit-cost ratio (\$/\$1)	0.43		0.93			2.08	2.57

³⁰ All estimates are given in 2007 dollars. The discount rate for costs and benefits in the present value analysis is 6 percent.

Adjustments for income distribution and current enrollment follow Karoly and Bigelow (2005).

Sensitivity analysis using Lynch (2007) distribution methodology (second scenario)

Benefit-cost estimates depend on assumptions about the distribution of benefits between less and more advantaged children. In this section, RESI explored how much benefit-cost analysis results are affected by assumptions about income distribution and previous pre-k attendance. For the sensitivity analysis of a two-year, voluntary pre-k program, RESI followed intermediate estimates of income distribution and previous pre-k attendance adopted by Lynch (2007). In this analysis it is assumed that 70 percent of three and four year olds would enroll in a voluntary, publicly funded pre-k-for-all program. Children who otherwise would have enrolled in a pre-k program would receive 60 percent of the benefits received by CPC participants. Children in the high-risk group would receive 100 percent of the benefits received by CPC participants; children in the medium-risk group would receive 85 percent of benefits, and children in the low-risk group would receive 70 percent of the benefits. The benefits from the proposed pre-k program using this adjustment methodology are about 58 percent of those for CPC.

The high-quality, two-year pre-k program for all three and four year olds in Maryland would enroll 104,587 children in 2009 and 105,809 children in 2010. The total offsetting *government budget* (federal, state, and local) benefits would exceed costs in 16 years (see Graph A2), while the Maryland state and local offsetting budget benefits would exceed costs in 23 years. In 2052, the last year estimated, the net budgetary surplus (federal and state combined) would total \$2.6 billion with \$1.3 billion in Maryland state and local net budgetary surplus. In 2052, every dollar spent on the program would return \$2.7 in budget savings, \$1.8 of which would go to Maryland taxpayers.

Increased compensation net of taxes for participants of the program and their guardians in the year 2052 would total \$4.5 billion. Savings to individuals from reduced crime would be \$2 billion. With these benefits to individuals included, the total benefits of pre-k for all three and four year-olds in Maryland would exceed the costs in seven years and would total about \$11.1 billion. The benefit-cost ratio would be 7.3 to 1 for U.S. society as a whole and 5.5 to 1 for Maryland society as a whole.

The results of the net present value analysis are summarized in Table A3. The program will generate \$29,966 total benefits per child enrolled in present value dollars, \$24,150 of which would go to Maryland society as a whole. Given the current funding streams for pre-k, the additional discounted program costs per child would equal \$7,828, giving a benefit-cost ratio of 3.83 to 1 for U.S. society as a whole and 3.08 to 1 for Maryland society.

The IRR for U.S. society as a whole would be 24 percent while the IRR for the government (federal, state, and local combined) would be 9 percent and 3 percent for Maryland state and local government. When net benefits are positive, the IRR is higher than the discount rate. These results show that if a discount rate of 3 percent were used instead of 6 percent³¹ for the net present value analysis, Maryland state and local government would break even or have a small positive net benefit.

³¹ Discount rates used for evaluation of public policy projects typically range from 3 to 6 percent. A 3 percent discount rate was used by Karoly and Bigelow (2005) and Reynolds et al. (2002), while Barnett (1993) used a 5 percent discount rate.

This analysis shows that results are sensitive to adopted assumptions regarding income distribution and previous pre-k attendance, as well as to the chosen discount rate. Additionally, the sensitivity analysis confirms that results reported in the main body of report are very conservative.

Graph A 2 Two-Year, Voluntary Pre-K for All Costs and Benefits, 2009-2052,
Second Scenario, (in millions of 2007 dollars)

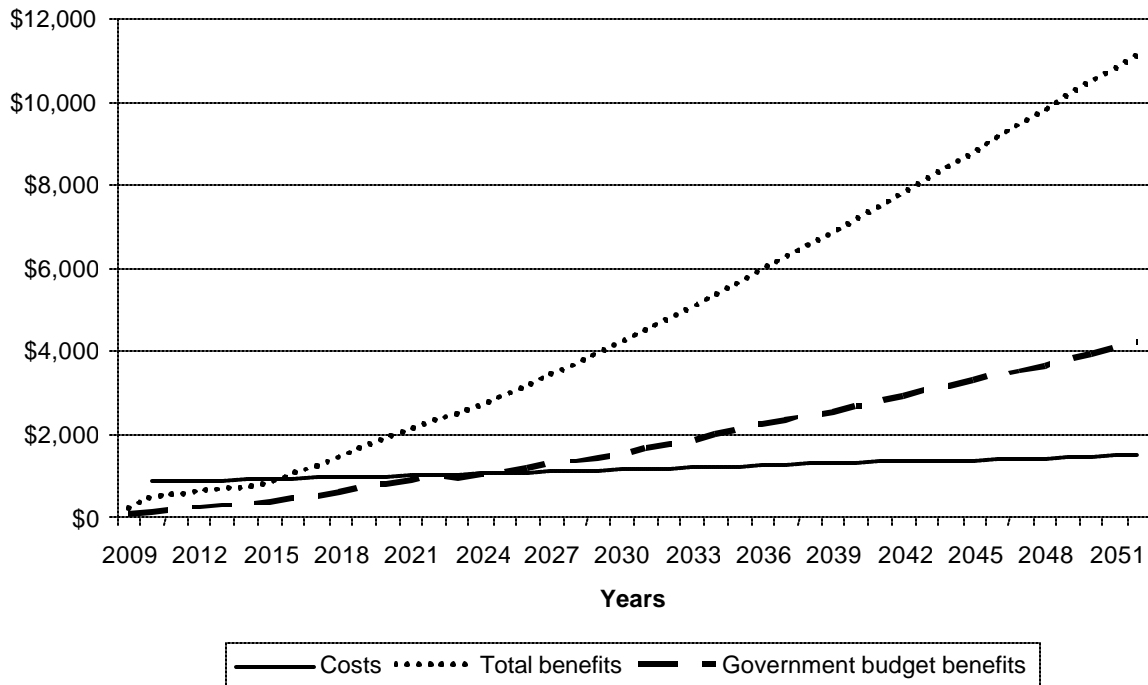


Table A3: **Present Value Costs and Benefits for a Two-Year Pre-K-for-All Program, First Scenario, (in 2007 present value dollars per child)³²**

Source of Costs or Benefits	Government Maryland State and		Total	Maryland Participants	Rest of Maryland Society	Total Society	
	Local	Federal				Maryland	Total U.S.
Program costs	(\$7,828)		(\$7,828)			(\$7,828)	(\$7,828)
Program benefits							
Education outcomes							
Grade retention	\$233	\$15	\$248			\$233	\$248
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Educational attainment	(\$498)	(\$33)	(\$531)			(\$498)	(\$531)
Child welfare outcomes							
Child welfare system costs	\$211	\$263	\$474			\$211	\$474
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Juvenile crime outcomes							
Justice system costs	\$513	\$111	\$624			\$513	\$624
Costs to victims of juvenile crime (tangible and intangible)					\$2,807	\$2,807	\$2,807
Value of child care				\$1,993		\$1,993	\$1,993
College attendance	(\$140)	(\$39)	(\$179)	(\$64)		(\$203)	(\$243)
Labor market earnings							
Net earnings/compensation for participants				\$5,083		\$5,083	\$5,083
Taxes on earnings for participants	\$751	\$2,695	\$3,446			\$751	\$3,446
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Justice system costs	\$155	\$33	\$189			\$155	\$189
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Net benefits	(\$4,451)		(\$543)			\$8,419	\$12,327
Benefit-cost ratio (\$/\$1)	0.43		0.93			2.08	2.57

³² All estimates are given in 2007 dollars. The discount rate for costs and benefits in the present value analysis is 6 percent.

Adjustments for income distribution and current enrollment follow Karoly and Bigelow (2005).

APPENDIX B

Child Care Center Directors and Child Care Staff

Perceptions about pre-k-for-all among early childhood professionals were gathered from focus groups involving child care center directors and child care staff. The interview project was designed to complement the analysis of funding currently available in support of programs for pre-k-age children. The immediate focus of the study is education and care for four year olds; although, at a later time, three year olds and even infants and toddlers may be a consideration. The purpose of the interviews was to explore the viewpoints of stakeholders in the profession who will be directly impacted by the voluntary pre-k-for-all initiative.

What We Wanted to Learn

The goals for the interviews were to hear the points of view of child care center directors and staff working in programs for four year olds on the feasibility of pre-k for all in terms of financial costs, infrastructure and logistics, and philosophy of best practices in programs for young children. Respondents were asked about community/school system collaboration, about the existing infrastructure of their programs, what would be needed to provide pre-k for all, and their recommendations about the initiative.

Methodology of the Interview Project

Three faculty members from Towson University conducted semi-structured interviews with five early childhood professionals, four of which took place at the respondent's center or school. The interviews lasted approximately one to one and a half hours and were audiotaped with the permission of the respondent. Transcriptions of the interviews have provided the opportunity for careful analysis. The interview protocol insured that all issues were addressed with each respondent. However, due to the conversational approach of the interviews, respondents often addressed several questions spontaneously during the interview.

Respondents and Their Programs

The programs selected for the interviews represent a variety of settings for pre-k-age children in Maryland. They included a mixture of part-day and full-day programs, Head Start, centers already in collaborative relationships with school systems, and private for-profit and not-for-profit programs. A variety of funding sources are available to supplement family tuition payments. Some centers were nationally accredited and others state-accredited, but all have demonstrated that they are high-quality programs. No franchise programs were included in the study to date. An elementary school principal was also included among the respondents to reflect a key component of the most effective pre-k-for-all models nationally, the community/school system partnership.

Summary of General Findings

For each of the child care centers, the bulk of the financial support came from tuition received from families of children served in three- and four-year-old classrooms. The infant/toddler rooms are more expensive to operate due to the need for low child-adult ratios. Under a pre-k-for-all system, implementing a change in current business models to allow centers to serve greater numbers of children birth to three years of age may be required. If, however, child care centers meet the standards for pre-k-for-all — i.e., becoming accredited, having certified teachers, providing an approved curriculum and professional development for center staff — this would strengthen the quality of the program and place the center in a position to receive more funding to serve four year olds.

Currently, several child care centers receive Judith P. Hoyer Enhancement funds to operate pre-k programs in partnership with a local school system. As a requirement of the grant, the programs must be accredited, provide certified teachers, and utilize a curriculum aligned with the Maryland Voluntary State Curriculum. According to an MSDE report, these programs are working but still face some implementation challenges. Partnerships between the local school districts and child care centers require support for collaboration around the payment of teacher salaries and benefits, provision of curriculum and materials of instruction, and in some cases, resolving issues about differing philosophies of education for pre-k children.

To meet the required standards for pre-k-for-all, a community-based program would need resources and support in the following areas: program quality and accreditation, teacher qualification, workforce development, and credentialing and compensation (i.e. bonuses). MSDE currently has a number of programs in place to provide support for all of these areas, but resources are not sufficient to effectively scale up this effort.

All of the directors believed that a voluntary pre-k-for-all program should be implemented but that great care must be given in determining what model will be used. The demographics of the area where these programs exist and the collaborative stance of the school systems are important factors in determining the successful roll-out of such a program.

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