BLUEPRINT FOR MARYLAND'S FUTURE

Blueprint for Maryland's Future:

Prekindergarten Sliding Scale Methodology

Division of Early Childhood

July 2023

MARYLAND STATE DEPARTMENT OF EDUCATION
EQUITY AND EXCELLENCE

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Executive Summary

Under the Blueprint for Maryland's Future, the Maryland State Department of Education (MSDE) is charged with establishing and implementing high-quality prekindergarten programming by expanding voluntary prekindergarten for all three- and four-year-old children from families earning incomes at or below 300% Federal Poverty Level (FPL), which was $83,250 for a family of four in 2022. The Blueprint requires MSDE to implement a sliding scale fee methodology to determine the family cost of care for families earning more than 300% FPL, but not more than 600% FPL, which was $166,500 for a family of four in 2022.

In the November 2021 report on prekindergarten implementation planning, MSDE presented four sliding scale options for these Tier II families earning between 300% and 600% of the FPL.[1] Under Options 1, 2, and 3, families would pay a percent of the cost of care with three, five, and 15 levels split across the FPL window, respectively, based on the family's income level. Under Option 4, families may pay a share of their annual income across five levels, ranging from a 1% share for 301%-360% FPL, up to 7% for 541%-600% FPL. This report models the four options for calculating the family share for Tier II children, provides a cost comparison of the options, presents a recommended sliding scale for implementation, and provides options for projecting Pre-K enrollment.

MSDE modeled the financial impact that implementing each of the four proposed sliding scales would have for Tier II families, with the aim to identify the sliding scale option that is least expensive for families. To calculate the family share of the cost of care, MSDE used the 2022-2023 enrollment data, which includes student household FPL income data for those enrolled in public Pre-K, and assumes that all families have four persons in them. For all Tier II children with FPL data reported (1,748 students), the total family contribution was significantly less expensive under Option 4 ($7,341,226); Options 2 and 3 were nearly identical ($9,042,355 and $9,034,788, respectively) while Option 1 was the most expensive for families ($9,625,860). A more granular examination of cost to families across FPL intervals was conducted, and Option 4 consistently was the least expensive option for families, particularly for lower-income households.

Estimating the total cost of the sliding scale using Option 4 is complicated by the high number of students without FPL income data reported. Of the 30,718 students enrolled in public Pre-K in the Fall of 2022, 11,556 students, or 37.6%, were missing income data. Modeling was conducted to assign students with missing data an FPL based on other socioeconomic neighborhood factors, which sufficiently estimates the effect of the missing data.

With the simulations discussed in this report, the state and local governments may contribute between 67.7% to 77.4% of the cost ($19,309,480–$28,201,100 combined, or $9,654,740–$14,100,550 each) for Tier II families to enroll in full-day Pre-K and the family share of the cost of care for Tier II families may be up to $9,206,098. Actual costs for future years may differ, depending on changes in enrollment levels or family income levels. To minimize financial impact on Tier II families, MSDE supports the implementation of sliding scale Option 4, which calculates family share of the cost of care as a percentage of income, ranging between 1% and 7%. The next steps for this work include gathering feedback from all stakeholder groups and making modifications, if necessary, based on the feedback received.

[1] https://marylandpublicschools.org/Blueprint/Documents/Reports122021/PrekindergartenImplementationPlanning.pdf

Legislative Background

Under the Blueprint for Maryland's Future legislation, the Maryland State Department of Education (MSDE) is tasked with developing a sliding scale structure for prekindergarten per pupil cost of care for families. The legislation stipulates high-quality full-day prekindergarten is available at no cost for families up to 300% of the Federal Poverty Level (FPL). The cost of Pre-K incrementally increases for families with incomes up to 600% of the FPL.

Section §5-229 of the Education Article, MD Code requires that:

(c)(1)(i) As calculated under subsection (D) of this section, there is a State share and local share of the per pupil amount for Tier I children.

(ii) There is no family share for Tier I children.

(2) As calculated under subsection (E) of this section and beginning in fiscal year 2025, there is a State share, local share, and family share of the per pupil amount for Tier II children.

(3) Tier III children are not eligible for funding under this section.

(e)(1) On or before July 1, 2022, the Department shall establish a sliding scale to calculate the family share required for Tier II children.

(2) The sliding scale developed by the Department shall be increased on a linear basis with:

(i) A lower limit of $0 per pupil for a family with an income that is 300% of the Federal Poverty Level; and

(ii) An upper limit of the per pupil amount for a family with an income that is more than 300% but less than 600% of the federal poverty level.

(3)(i) Beginning in fiscal year 2025, the family shall pay the family share to the publicly funded prekindergarten provider.

(ii) A county board may provide up to 100% of the family share on behalf of the family.

Starting in the fall of 2022, each local education agency (LEA) reported FPL and Tier data for enrolled Prekindergartners with the annual enrollment collection. Inclusion of this data has allowed MSDE to conduct an impact study on the cost of the four sliding scale options to identify the option that would minimize cost to families (particularly for lower-income households). This report presents the results of this study and makes a recommendation for which sliding scale to implement.

Prekindergarten Sliding Scale Fee Methodology

PREKINDERGARTEN ENROLLMENT ELIGIBILITY FOR BLUEPRINT STATE AID PREKINDERGARTEN FUNDING

Under the Blueprint, income eligibility for prekindergarten cost subsidies is based on a system of tiers:

Tier I: children from families with an annual income less than or equal to 300% Federal Poverty Level (FPL) are eligible for publicly funded, full-day Pre-K at no charge to the family.

Tier II: children from families with an annual income of more than 300% FPL but not more than 600% FPL are eligible for a subsidized, full-day Pre-K.

Tier III: children from families with an annual income above 600% FPL are eligible to attend full-day Pre-K at the full cost of the program.

TIER II CHILDREN AND THE SLIDING SCALE

The sliding scale fee methodology required by law directs MSDE to differentiate the cost of childcare for families within Tier II and to provide for a more nuanced, equitable approach to fee subsidizations. There are, however, multiple approaches to a sliding scale that have different impacts on eligible families. Existing practice from other states (see examples below) suggests two primary sliding scale approaches:

1. Families must pay a portion of total cost of care; that portion depends on where their income falls as compared to the federal poverty level (see Arkansas example and Blueprint options 1 and 2 below)

2. Families must pay a portion of their income; that portion also depends on where their income falls as compared to the federal poverty level (see Michigan Example and Blueprint option 3 below)

EXAMPLES FROM OTHER STATES

Existing state approaches to prekindergarten enrollment provide a guide for establishing a sliding scale methodology in Maryland:[2]

Arkansas

The Arkansas Better Chance (ABC) program utilizes a state established annual fee schedule and sliding fee scale to determine eligibility of families with incomes between 200% FPL and 250% FPL. Under the schedule, families pay a particular percentage of the total cost of care, depending on their income. There are four levels on the scale, evenly divided (e.g., families in this "middle tier" pay either 20%, 40%, 60%, or 80% of the full cost).[3]

Michigan

Based on a sliding fee schedule from 2019, families in Michigan with incomes below 250% FPL pay no tuition, those with incomes from 250% to 350% FPL pay 5% of their annual income per child and those above 350% pay 10% of their annual income. Intermediate school districts (ISDs) may adopt or amend the sample tuition sliding scale. Alternately, an ISD may create their own sliding scale for parent payment.[4]

[2] https://docs.house.gov/meetings/ED/ED00/20210909/114029/BILLS-117-CommitteePrint2-S000185-Amdt-1.pdf

[3] https://dese.ade.arkansas.gov/Files/20201201155552_2019_20_ABC_Program_Manual_10_10_19.pdf Appendix F

[4] Additional information can be found at https://www.michigan.gov/mde/services/early-learners-and-care/gsrp.

Sliding Scale Options

The Blueprint for Maryland's Future requires that the Department establish a sliding scale to calculate the family share required for Tier II children.

Based on existing state and district approaches, in the November 2021 legislative report Prekindergarten Implementation Planning MSDE presented four sliding scale options to calculate the family share for Tier II children:

Option 1: Family Pays Percent of Total Cost of Care: Three Levels

Option 2: Family Pays Percent of Total Cost of Care: Five Levels

Option 3: Family Pays Percent of Total Cost of Care: Fifteen Levels

Option 4: Family Pays a Percent of Income: Five Levels

The FY 2022 federal poverty level was $27,750 for a family of four (see Appendix C for information on the effects family size has on cost of care). The calculations in each option use FY 2022 federal poverty level for a family of four and the FY 2025 Pre-K Program per pupil amount of $13,003. The FY2022 FPL was used (despite 2023 guidelines available) because it best aligns with student enrollment in the Fall of 2022 and the FY 2025 Pre-K Program per pupil cost aligns with the sliding scale implementation year. The options MSDE is considering for the sliding scale are outlined below.

OPTION 1: FAMILY PAYS PERCENT OF TOTAL COST OF CARE: THREE LEVELS

- Families with an annual income between 301% FPL and 400% FPL are eligible for full-day Pre-K at 25% of the per pupil cost.
- Families with an annual income between 401% FPL and 500% FPL are eligible for full-day Pre-K at 50% of the per pupil cost.
- Families with an annual income between 501% FPL and 600% FPL are eligible for full-day Pre-K at 75% of the per pupil cost.

Table 1: Option 1: Tier II Sliding Scale Structure – Three Levels

Federal Poverty Level	Annual Income Range[5]	Family Share	Annual Amount	Monthly Amount*
301% - 400%	$83,528 - $111,000	25%	$3,251	$325
401% - 500%	$111,278 - $138,750	50%	$6,502	$650
501% - 600%	$139,028 - $166,500	75%	$9,752	$975

*Based on a 10-month billing cycle

[5] Income ranges reported are based on FY 2022 federal poverty guidelines assuming a family of four. For other household sizes, see https://aspe.hhs.gov/topics/poverty-economic-mobility/poverty-guidelines

OPTION 2: FAMILY PAYS PERCENT OF TOTAL COST OF CARE: FIVE LEVELS

- Families with an annual income between 301% FPL and 360% FPL are eligible for full-day Pre-K at 10% of the per pupil cost.
- Families with an annual income between 361% FPL and 420% FPL are eligible for full-day Pre-K at 30% of the per pupil cost.
- Families with an annual income between 421% FPL and 480% FPL are eligible for full-day Pre-K at 50% of the per pupil cost.
- Families with an annual income between 481% FPL and 540% FPL are eligible for full-day Pre-K at 70% of the per pupil cost.
- Families with an annual income between 541% FPL and 600% FPL are eligible for full-day Pre-K at 90% of the per pupil cost.

Table 2: Option 2: Tier II Sliding Scale Structure – Five Levels

Federal Poverty Level	Annual Income Range[5]	Family Share	Annual Amount	Monthly Amount*
301% - 360%	$ 83,528 - $ 99,900	10%	$1,300	$130
361% - 420%	$100,178 - $116,550	30%	$3,901	$390
421% - 480%	$116,828 - $133,200	50%	$6,502	$650
481% - 540%	$133,478 - $149,850	70%	$9,102	$910
541% - 600%	$150,128 - $166,500	90%	$11,703	$1,170

*Based on a 10-month billing cycle

OPTION 3: FAMILY PAYS PERCENT OF TOTAL COST OF CARE: FIFTEEN LEVELS

Income thresholds mirror those suggested in the Maryland Commission on Innovation and Excellence in Education's Interim Report (January 2019, page 41).[6]

- "To avoid a cliff effect whereby a small increase in income results in a significant loss of public [financial] support, there will be approximately 15 steps, with a 6-7 percentage point difference between each step."
- "Families with incomes above 600% FPL/$150,000 for a family of four will pay the full cost for four-year-old Pre-K"

[6] http://dls.maryland.gov/pubs/prod/NoPblTabMtg/CmsnInnovEduc/2019-Interim-Report-of-the-Commission.pdf

Table 3: Option 3: Tier II Sliding Scale Structure – Fifteen Levels

Federal Poverty Level	Annual Income Range[5]	Family Share	Annual Amount	Monthly Amount*
301% - 320%	$ 83,528 - $ 88,800	6%	$ 780	$ 78
321% - 340%	$ 89,078 - $ 94,350	12%	$ 1,560	$ 156
341% - 360%	$ 94,628 - $ 99,900	19%	$ 2,471	$ 247
361% - 380%	$100,178 - $105,450	25%	$ 3,251	$ 325
381% - 400%	$105,728 - $111,000	31%	$ 4,031	$ 403
401% - 420%	$111,278 - $116,550	37%	$ 4,811	$ 481
421% - 440%	$116,828 - $122,100	44%	$ 5,721	$ 572
441% - 460%	$122,378 - $127,650	50%	$ 6,502	$ 650
461% - 480%	$127,928 - $133,200	56%	$ 7,282	$ 728
481% - 500%	$133,478 - $138,750	62%	$ 8,062	$ 806
501% - 520%	$139,028 - $144,300	69%	$ 8,972	$ 897
521% - 540%	$144,578 - $149,850	75%	$ 9,752	$ 975
541% - 560%	$150,128 - $155,400	81%	$10,532	$1,053
561% - 580%	$155,678 - $160,950	87%	$11,313	$1,131
581% - 600%	$161,228 - $166,500	94%	$12,223	$1,222

*Based on a 10-month billing cycle

OPTION 4: FAMILY PAYS A PERCENTAGE OF INCOME: FIVE LEVELS

- Families provide verification of total income, through systems including Free and Reduced Meal Program (FARM) eligibility, Direct Certification documentation (eligibility for Supplemental Nutrition Assistance Program (SNAP), Temporary Assistance for Needy Families (TANF), or Foster Care documentation).
- Families shall not pay more than 7% of their annual income under this sliding scale option, which is consistent with sliding fee scale copayment caps at the federal level[7,8]

Table 4: Option 4: Tier II Sliding Scale Structure – Five Levels

Federal Poverty Level	Annual Income Range[5]	Family Share: Percent of Annual Income	Annual Amount	Monthly Amount*
301% - 360%	$ 83,528 - $ 99,900	1%	$835 - $999	$84 - $100
361% - 420%	$100,178 - $116,550	2%	$2,004 - $2,331	$200 - $233
421% - 480%	$116,828 - $133,200	4%	$4,673 - $5,328	$467 - $533
481% - 540%	$133,478 - $149,850	6%	$8,009 - $8,991	$801 - $899
541% - 600%	$150,128 - $166,500	7%	$10,509 - $11,655	$1,051 - $1,166

*Based on a 10-month billing cycle

[7] https://docs.house.gov/meetings/ED/ED00/20210909/114029/BILLS-117-CommitteePrint2-S000185-Amdt-1.pdf

[8] https://www.whitehouse.gov/briefing-room/statements-releases/2021/04/28/fact-sheet-the-american-families-plan/

Modeling Family and Government Cost Shares for Tier II Pre-K Students

To determine the relative cost to Tier II families, compared to the cost covered by the State and local governments, for each sliding scale option, MSDE modeled cost estimates at different family income levels.

Sliding Scale Cost Modeling

To compare the relative cost to Tier II families between the sliding scale options, three examples are presented at different income levels within Tier II: for families earning 350% FPL, families earning 450% FPL, and families earning 550% FPL. For more details on each sliding scale option, see the chapter of this report titled "Sliding Scale Options".

In the first comparison, families earning 350% of the FPL would contribute 25% of the total cost of care ($3,251 per pupil) under Option 1, whereas under Option 2, the family would contribute 10% of the total cost of care ($1,300 per pupil). The state and local governments would be responsible for the remaining share of the cost of care (75% and 90% for Options 1 and 2, respectively). Under Option 4, the family share of the cost of care is a factor of the family's annual income.[9] Therefore, under Option 4, families earning 350% of the FPL ($97,125/year for a family of four) would contribute 1% of their annual income to the cost of care ($971), while the state and local governments would be responsible for the remaining cost of care ($12,032).

Table 5 shows the annual cost amounts for families earning 350% of the Federal Poverty Level, depending on which sliding scale option is in place. For these families, the cost of care ranges between 1.0 and 3.3% of their income, with Option 4 as the lowest cost and Option 1 as the most expensive.

Table 5: Comparison of Sliding Scale Options for Household Income at 350% FPL

Sliding Scale Option	Family Share	Share of Annual Income	Annual Amount for Families*	Annual Amount for State and Local Governments*
Option 1	25% of cost of care	3.3%	$3,251	$9,752
Option 2	10% of cost of care	1.3%	$1,300	$11,703
Option 3	19% of cost of care	2.5%	$2,471	$10,532
Option 4	7% of cost of care	1.0%	$971	$12,032

*Based on FY2025 total cost of care of $13,003 and FY2022 Federal Poverty Level of $27,750 (for a family of four).

Table 6 shows the annual amount for families earning 450% of the Federal Poverty Level, depending on which sliding scale option is in place. For these families, the cost of care ranges between 4.0% and 5.2% of their annual income, with Option 4 as the lowest cost and Options 1, 2, and 3 as the same, more expensive cost.

[9] Because only FPL data is reported for each child enrolled in Pre-K in 2023, and not family size, a family of four is assumed to calculate the family annual income from the FPL, using the FY2022 Federal Poverty Level of $27,750. See Appendix C for the effects of family size on cost of care.

Table 6: Comparison of Sliding Scale Options for Household Income at 450% FPL

Sliding Scale Option	Family Share	Share of Annual Income	Annual Amount for Families*	Annual Amount for State and Local Governments*
Option 1	50% of cost of care	5.2%	$6,502	$6,502
Option 2	50% of cost of care	5.2%	$6,502	$6,502
Option 3	50% of cost of care	5.2%	$6,502	$6,502
Option 4	38% of cost of care	4.0%	$4,995	$8,008

*Based on FY2025 total cost of care of $13,003 and FY2022 Federal Poverty Level of $27,750 (for a family of four).

Table 7 shows the annual amount for families earning 550% of the Federal Poverty Level, depending on which sliding scale option is in place. For these families, the cost of care ranges from 6.4 to 7.7% of income, with Option 1 the lowest cost and Option 2 the most expensive.

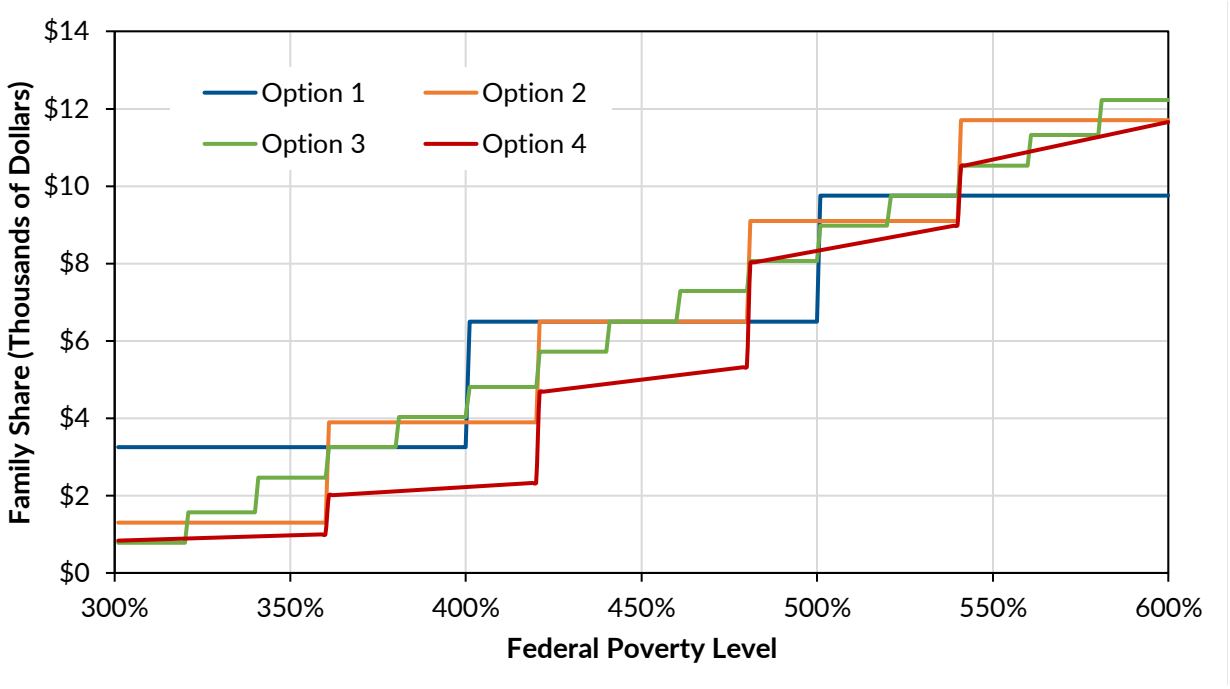
Table 7: Comparison of Sliding Scale Options for Household Income at 550% FPL

Sliding Scale Option	Family Share	Share of Annual Income	Annual Amount for Families*	Annual Amount for State and Local Governments*
Option 1	75% of cost of care	6.4%	$9,752	$3,251
Option 2	90% of cost of care	7.7%	$11,703	$1,300
Option 3	81% of cost of care	6.9%	$10,532	$2,471
Option 4	82% of cost of care	7.0%	$10,684	$2,319

*Based on FY2025 total cost of care of $13,003 and FY2022 Federal Poverty Level of $27,750 (for a family of four).

The three comparison examples presented above provide detailed cost amounts at three specific income levels but may not necessarily capture the overall results of each option across the full range of incomes within Tier II. Figure 1 indicates the family share at each federal poverty level within Tier II for all four sliding scale options. Option 4, represented by the red line, provides the lowest family share of all options, with the exception of federal poverty levels 481-500% and 541-600%, for which Option 1 is the least expensive. In fact, for much of the range of FPL from 361% to 480%, the family share required by Option 4 is substantially lower than the other options.

Figure 1: Tier II Family Share Comparisons for All Proposed Sliding Scale Options



Simulation of Family Share Using Enrollment Data

MSDE calculated the potential cost for families of Tier II children and state and local funding to estimate the relative cost of each option based on the latest pre-kindergarten enrollment data.

The impact of the implementation of each sliding scale option was evaluated using 2022-2023 Pre-K enrollment Federal Poverty Level (FPL) data (Table 8).[10] For all options, any child from families earning incomes at or below 300% of the FPL is eligible for publicly funded, full-day Pre-K at no cost to the family; one hundred percent of the FY2025 program cost of care of $13,003 is assigned to the total state and local contribution.

In September 2022, there were 30,718 children enrolled in Maryland public prekindergarten programs, 19,162 (62.4%) of these students have income tier and federal poverty level data reported. Of that subset, 16,762 students (54.6%) are identified as Tier I, with family incomes at or below 300% federal poverty level. These children would qualify for access to full-day Pre-K at no cost, with contributions by State and local governments totaling $217,956,286 for these Tier I families. Only 652 students were reported as Tier III, in which families may be required to cover the full cost of care ($8,477,956 total for these 652 students).

Table 8: Number of Qualifying Students for Each Income Tier Based on SY2023 Enrollment Data

	Tier I	Tier II	Tier III	Missing Income Tier Data
Number of Qualifying Students	16,762	1,748	652	11,556
Percent of Qualifying Students	54.6%	5.7%	2.1%	37.6%

Since the sliding scale would only apply to families in Tier II, Table 9 shows the distribution of Tier II children by 15 different levels, made of 20 percentage point increments of the Federal Poverty Level. Enrolled Tier II children were disproportionately in the lower income levels, with approximately two to three times as many children from families in the 300-400% of FPL range as in the 500-600% FPL range.

Table 9: Distribution of Tier II Children Enrolled in Pre-K in Sept 2022 in the Option 3 Sliding Scale Structure

Federal Poverty Level	Number of Tier II Enrolled Children	Percent of Tier II Enrolled Children*
Level 1: 301% - 320%	190	10.9%
Level 2: 321% - 340%	190	10.9%
Level 3: 341% - 360%	163	9.3%
Level 4: 361% - 380%	161	9.2%
Level 5: 381% - 400%	182	10.4%
Level 6: 401% - 420%	96	5.5%
Level 7: 421% - 440%	123	7.0%
Level 8: 441% - 460%	107	6.1%
Level 9: 461% - 480%	88	5.0%

[10] The September 30th Enrollment collection in 2022-2023 was the first year that Federal Poverty Level data was collected from families of Pre-K students.

Federal Poverty Level	Number of Tier II Enrolled Children	Percent of Tier II Enrolled Children*
Level 10: 481% - 500%	97	5.5%
Level 11: 501% - 520%	79	4.5%
Level 12: 521% - 540%	88	5.0%
Level 13: 541% - 560%	67	3.8%
Level 14: 561% - 580%	62	3.5%
Level 15: 581% - 600%	55	3.1%

* Percentages reported only includes Tier II students.

The cost to families for the 1,748 Tier II children was calculated using the sliding scale structures for each of the four options based on each students' reported FPL. Table 10 shows the total family share of the cost of care for Tier II families ranges from $7,341,226 under Option 4 to $9,625,860 under Option 1. Options 2 and 3 were nearly identical in estimated cost of care for families and only slightly below the total cost to families when compared to Option 1. Option 4 is significantly less expensive than the other three options, saving families a combined $1.5 to $2 million, compared to the alternatives.

Table 10: Total Pre-K Family Cost Option Comparison for Tier II Families

Sliding Scale Option	Total Tier II Family Contribution (FPL 301 – 600%)	Total State & Local Contribution	Family Contribution: Percent of Total Cost*
Option 1	$9,625,860	$13,103,384	42.4%
Option 2	$9,042,355	$13,686,889	39.8%
Option 3	$9,034,788	$13,694,456	39.7%
Option 4	$7,341,226	$15,388,018	32.3%

*Percentage of the family contribution relative to the total cost of care.
Note: Red fields identify the option that is most expensive for Tier II families, whereas green fields identify the option that is least expensive for families.

Table 11 presents a more granular cost-comparative analysis by aggregating the cost of Option 3 within the sliding scale structure of the options with fewer levels. Due to the FPL structure of the four options, direct sub-Tier comparisons cannot be made between all options (e.g., Option 3 can be aggregated to the 3-level structure of Option 1 for comparison, however Options 2 and 4 cannot be due to the level breaks not aligning). This approach allows for each option to be evaluated on the impact they would have on lower- and higher-income families. For example, the cost of the first five levels of Option 3 can be aggregated and directly compared to the cost to families of the first level of Option 1 (FPL 301% – 400%). Results show Option 1 disadvantages lower-income households more than Option 3, with approximately $776,000, or 27%, more contributed by families within the 301–400% FPL. The difference between Option 1 and Option 3 for the middle of the Tier II

income range is negligible (1.2%), while the difference for the high end of the Tier II is of a smaller magnitude (6.1%) than the difference for the lower end of the tier.

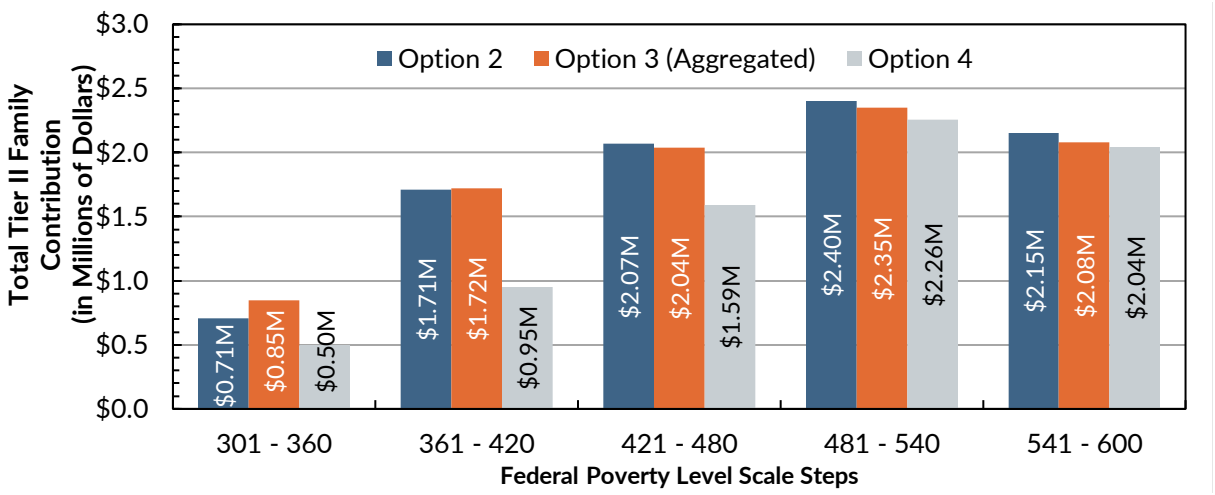
Table 11: Prekindergarten Family Costs Comparison Between Options 1 and 3

Sliding Scale Option	301 – 400%	401 – 500%	501 – 600%
Option 1	$2,880,386	$3,322,522	$3,422,952
Option 3 (aggregated)	$2,104,426	$3,284,083	$3,646,279

Note: Red fields identify options that cost >$200,000 more for a share step over the compared option.

Additionally, Figure 2 aggregates Option 3 for direct comparison in share-structure contributions relative to Options 2 and 4. Results show that Option 4 provides the best overall cost advantage for Tier II families across all five scale steps, particularly for lower-income households (Figure 2).

Figure 2: Share-Structure Cost Comparisons Between Option 2, Option 3 (aggregated), and Option 4



Simulating Tier II Cost of 2023 Enrollment

In the prior section of this report, cost differences of each sliding scale option to Tier II families were estimated. As discussed, one complication in estimating a total cost for Tier II families based on 2023 enrollment is the high percentage of students missing FPL data. To address the missing income data, three approaches for estimating total cost were taken:

1. Only calculate family, local, and state contributions for the cost of care for students with FPL data available. (The ~38% of students with missing data are not included in this estimate, and total cost will be an underestimate[11].)

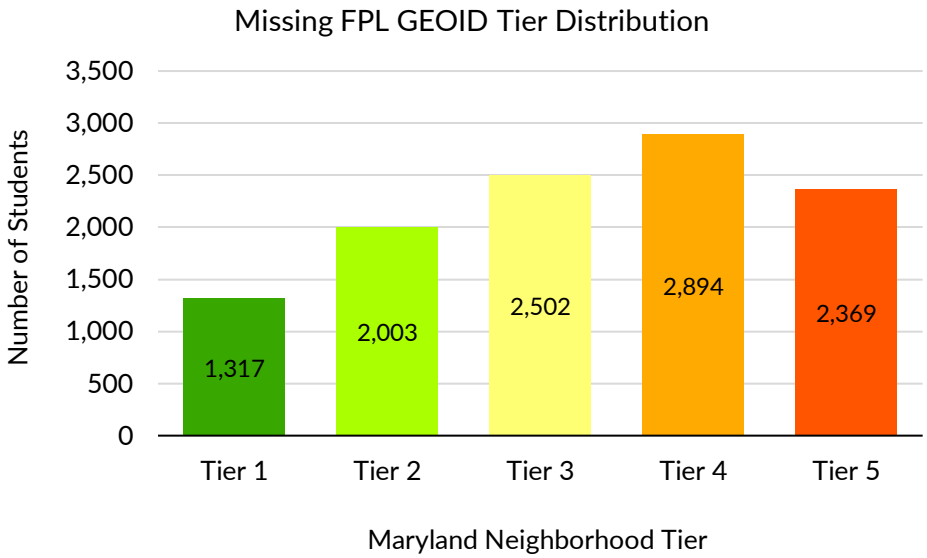
2. Assign students with missing FPL data to a Tier, maintaining the Tier distributions for the data currently available. Children placed in Tier II will be given an FPL of 305%.

[11] The cost will be an underestimate due to undercounting the number of students actually enrolled in Pre-K due to missing FPL data. However, this will be a precise estimate in terms of State aid because the State cannot assign students with unreported FPL. With the implementation of Tier II funding, MSDE anticipates LEAs will respond to the incentive created by the additional funding and, as a result, MSDE provides estimate approaches 2 and 3 to identify a potential future maximum cost of adopting the recommended Tier II sliding scale option.

3. Use student geographical identifiers (GEOIDs) to group students within Census Block Groups. The median FPL of students in each Block Group is assigned to any students without FPL data available. Students with missing FPL and GEOID information are assigned to Tier I.

To evaluate if the Tiers assigned to students under estimation approach 3 is reasonably capturing the income distributions based on the geographical region they reside, the frequency of students in each of the Maryland Neighborhood Tier[12] (MNT) is compiled. With the MNT system, students from MNT Tier 1 Census Block Groups live in neighborhoods with high socioeconomic status (SES), whereas students in MNT Tier 5 Block groups live in neighborhoods with low SES. Therefore, it is expected that if a majority of students with missing FPL information reside in MNT Tier 5 neighborhoods, then it is more likely they live in a household with lower FPL (e.g., Pre-K Tier I at <300% the FPL). The MNT distribution for children with missing FPL in the enrollment file is skewed towards higher MNT Tiers (Figure 3), with MNT Tier 4 being the most common, followed by MNT Tiers 3 and 5, suggesting a majority of the students with missing FPL data likely live in Pre-K Tier I and II households. This is consistent with how students are distributed under estimate approach 3 discussed above.

Figure 3: Maryland Neighborhood Tier distribution for Pre-K students with missing FPL data[13]



Following the estimate approaches outlined above, the number of students without FPL data are assigned FPL as shown in Table 12.

Table 12: Student Pre-K Tier distributions used for simulating total cost of care

	Pre-K Tier I	Pre-K Tier II	Pre-K Tier III	Unassigned
Estimate 1	16,762	1,748	652	11,556
Estimate 2	26,871	2,802	1,045	0
Estimate 3	27,728	2,193	797	0

[12] For more information on Neighborhood Indicators of Poverty, see the report at https://blueprint.marylandpublicschools.org/wp-content/uploads/sites/20/2023/01/2023-Indicators-of-Poverty_Formula-Addendum.pdf.

[13] Results exclude 2 students from Block Groups without MNT Tier assignment and 469 students without GEOID data.

The statewide cost of care is broken down by family, state, and local government shares for each of the three estimated cost approaches (Table 13). Note that this cost is likely a minimum for Tier II families (maximum for State and local) under approach 2 because students assigned to Tier II are given a fixed FPL of 305% requiring near-minimum cost under sliding scale Option 4. Estimate approach 3 predicts the family share of the cost of care would be a third of the total cost of care.

Table 13: Total Tier II family, state, and local cost share for outlined simulation approaches

Estimate Approach	Share Source			Total Tier II Cost
	Family	State	Local	
1*	$7,341,226	$7,694,009	$7,694,009	$22,729,244
2	$8,233,305	$14,100,550	$14,100,550	$36,434,405
3	$9,206,098	$9,654,740	$9,654,740	$28,515,578

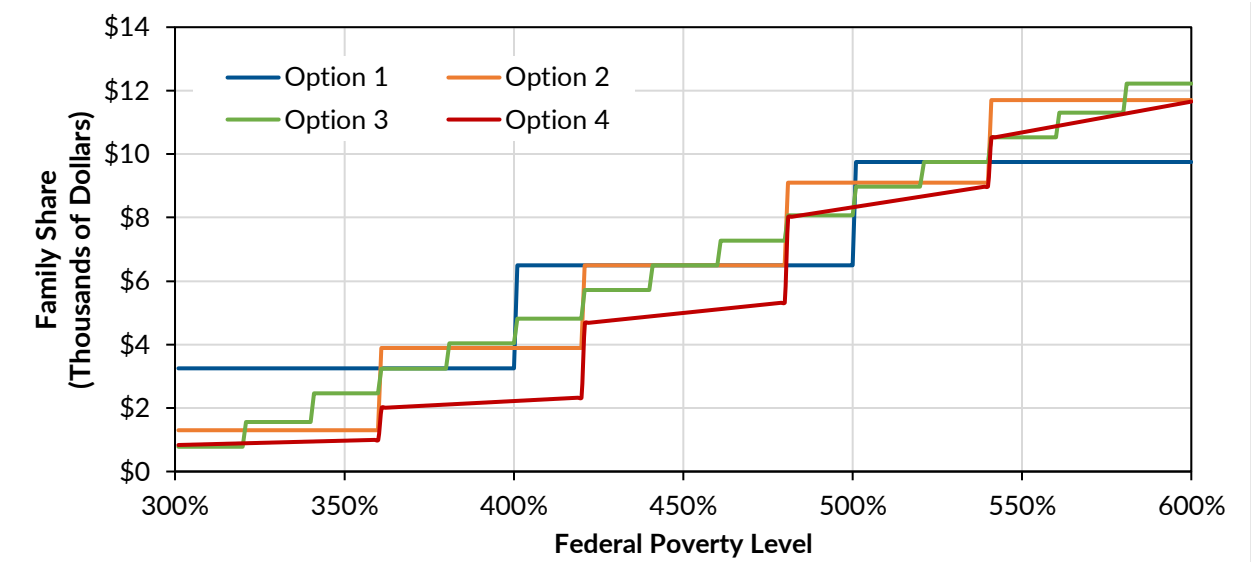
*Cost estimates for this approach are an underestimate because it does not assume an FPL for students with missing data and therefore cannot calculate cost for these students.
Note: State and local governments have a 50:50 split in cost share.

Policy Recommendation

MSDE recommends adopting sliding scale option 4 to calculate the family share of cost of care for Pre-K Tier II families based on the modeling and analyses of the four sliding scale options presented in this report.

The Blueprint requires MSDE to implement a sliding scale fee methodology to determine the family cost of care for Tier II families, those earning more than 300% FPL, but not more than 600% FPL. Using the 2022-2023 public Pre-K Enrollment data, the cost of full-day care for children in Tier II households was calculated for each of the four proposed sliding scales. Figure 4 below indicates the family share at each federal poverty level within Tier II for all four sliding scale options. Option 4, represented by the red line, provides the lowest family share of all options, with the exception of federal poverty levels 481-500% and 541-600%, for which Option 1 is the least expensive. In fact, for much of the range of FPL from 361% to 480%, the family share required by Option 4 is substantially lower than the other options.

Figure 4: Tier II Family Share Comparisons for All Proposed Sliding Scale Options



The total cost of care for Tier II families was calculated for each option. Using the data available, Option 4 costs a combined $1.7–$2.3 million (or 18.7-23.7%) less for Tier II families relative to Options 1–3 (Table 14).

Table 14: Total Pre-K Family Cost Option Comparison for Tier II Families

Sliding Scale Option	Total Tier II Family Contribution (FPL 301 – 600%)	Total State & Local Contribution	Family to State & Local Contribution Percent*
Option 1	$9,625,860	$13,103,384	42.4%
Option 2	$9,042,355	$13,686,889	39.8%
Option 3	$9,034,788	$13,694,456	39.7%
Option 4	$7,341,226	$15,388,018	32.3%

*Percentage of the family contribution relative to the state and local contribution.

Note: Red fields identify the option that is most expensive for Tier II families, whereas green fields identify the option that is least expensive for families.

MSDE recommends the adoption of sliding scale Option 4 to determine Pre-K cost of care for Tier II families, which determines cost based on a percentage of annual family income. Compared to the other three options, modeling shows Option 4 would result in a lower cost to Tier II families. Modeling estimates also showed that Option 4 would also result in lower costs for families with incomes at the lower and middle levels of Tier II. The details of sliding scale option 4 are provided below in Table 15.

Table 15: Recommended Sliding Scale: Option 4

Federal Poverty Level	Annual Income Range[5]	Family Share: Percent of Annual Income	Annual Amount	Monthly Amount*
301% - 360%	$ 83,528 - $ 99,900	1%	$835 - $999	$84 - $100
361% - 420%	$100,178 - $116,550	2%	$2,004 - $2,331	$200 - $233
421% - 480%	$116,828 - $133,200	4%	$4,673 - $5,328	$467 - $533
481% - 540%	$133,478 - $149,850	6%	$8,009 - $8,991	$801 - $899
541% - 600%	$150,128 - $166,500	7%	$10,509 - $11,655	$1,051 - $1,166

*Based on a 10-month billing cycle

The total cost of care of public Pre-K using the 2022-2023 enrollment numbers is $399,426,154 ($13,003 x 30,718 children) for families from all three Tiers. With the simulations included in this report, state and local government may contribute up to 77.4% of this cost ($28,201,100 combined, or $14,100,550 each) for Tier II families; family share of the cost of care for Tier II families may be up to $9,206,098.

Next Steps and Operationalization

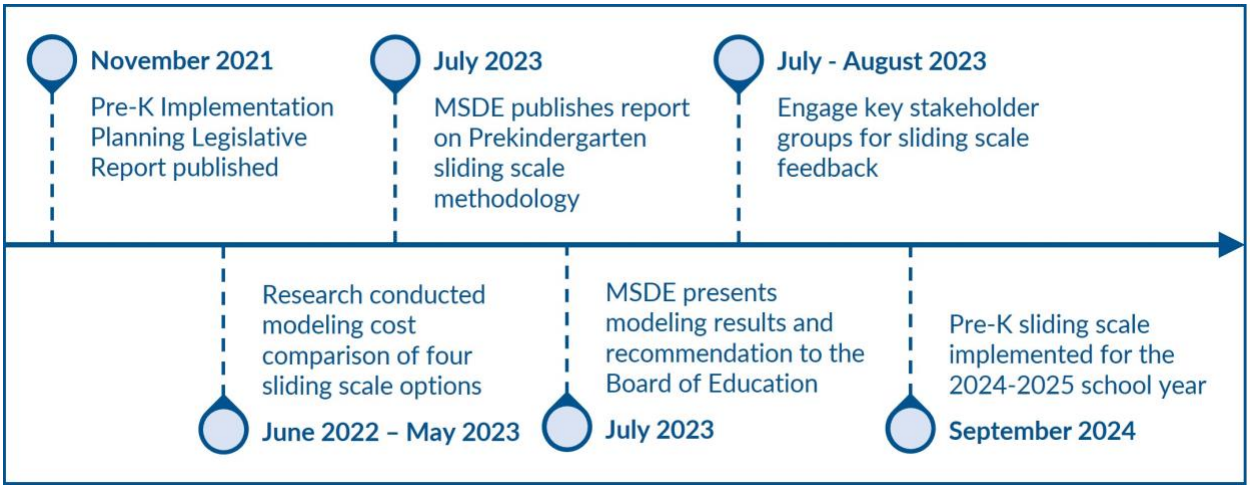
As Maryland moves to expand voluntary public high-quality full-day prekindergarten, MSDE will:

1. **Gather Input. July 2023 – August 2023.**
   MSDE will share and vet the proposed sliding scale option with local education agencies and community providers, as well as other relevant stakeholders to ensure that the proposed sliding scale is the most efficient for all affected parties, especially those families most historically unable to access high-quality Pre-K.

2. **Amend Sliding Scale, if Necessary, Based on Feedback and Publish Final Methodology. September 2023**.
   MSDE will finalize the sliding scale calculations and the above presented impact analysis based on input from stakeholders and will share the final methodology with LEAs and other stakeholders. MSDE will also update and resupply to LEAs a revised State Aid Calculator tool that reflects the final methodology to assist LEA and county budget planning.

After the final methodology for the sliding scale has been published, MSDE will continue to work with LEA CFOs, Pre-K providers, the Governor, the Maryland Department of Budget and Management, the General Assembly's Department of Legislative Services, families, and other relevant stakeholders to ensure that all involved can seamlessly implement the sliding scale. As directed in the legislation, the sliding scale for Tier II families goes into effect starting in the fall of 2024, for the 2024-2025 school year. Data collection processes for LEAs regarding family income eligibility will be unchanged and will remain as it is currently being implemented.

Figure 5: Timeline of Progress Towards Sliding Scale Implementation



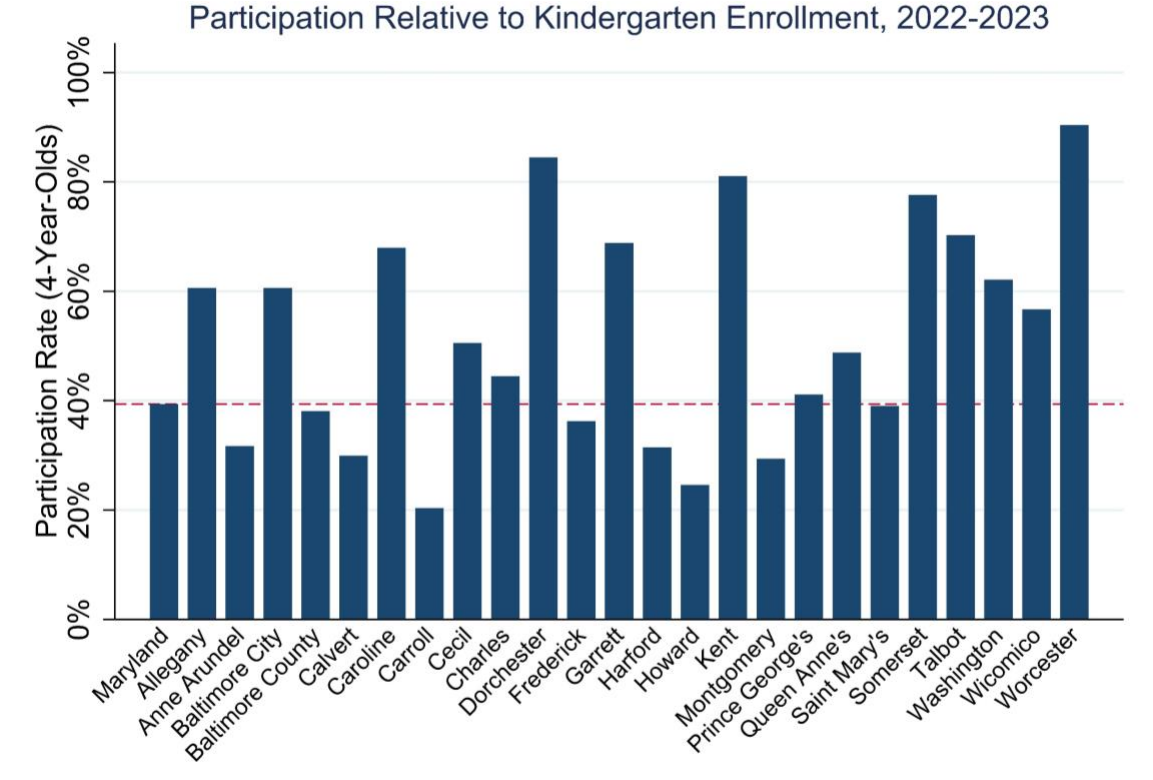
Appendix A: Assumptions and Caveats

Several assumptions were made in the modeling presented in this report. First, the Federal Poverty Level (FPL) is dependent upon family size, which is not available in the enrollment data. Therefore, the cost of care reported for Option 4 is estimated assuming a family of four, and family sizes that differ from this could impact the projected cost of care.

Second, costs reported only include students with FPL data available and may be an underrepresentation of the true total cost of care (see Table 8 for the number of students with missing FPL data in 2023). The distribution of family income for this missing group of students may impact which of the first three options would cost most to families overall statewide. For example, if students with missing FPL data are disproportionately from households within the lower range of Tier 2 (e.g., 350% of the FPL), Option 2 would be a lower-cost option (Table 5). However, if families with missing FPL data are predominantly from the higher end of the Tier 2 range (e.g., 550% of the FPL), Option 2 would be the most expensive option and Option 1 would be a lower cost option (Table 7). Except when near the Tier 3 threshold, Option 4 is the best cost option for families, particularly for lower-income households.

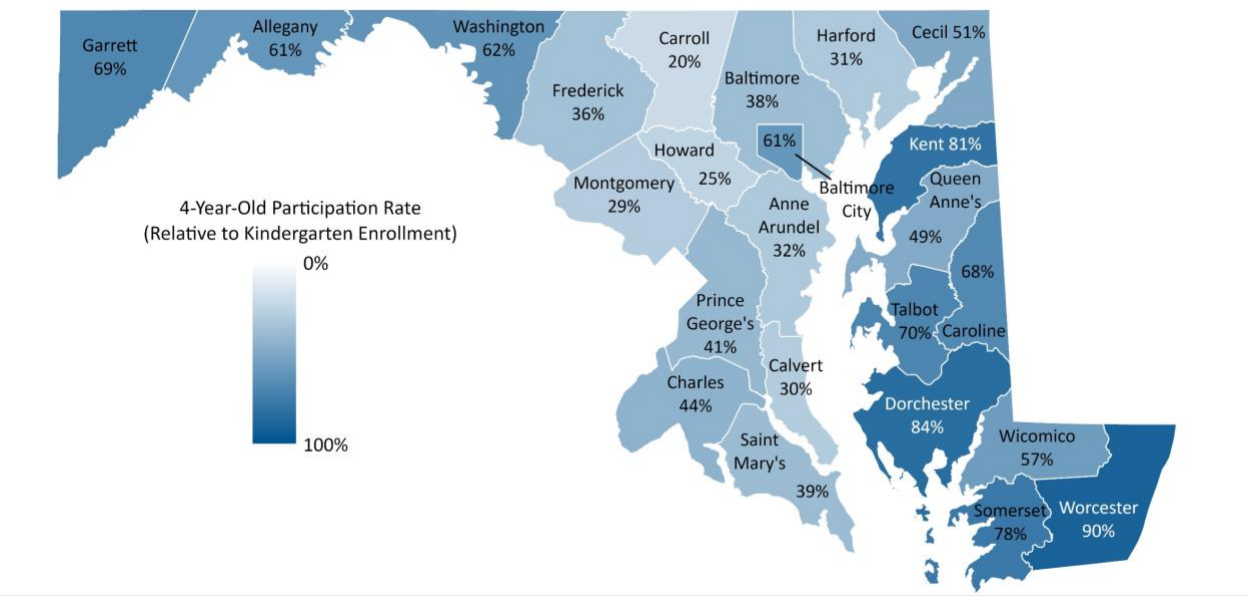
Third, the modeling results presented reflect distributions and costs aggregated at the state level. Pre-K participation rates, participation rate changes through time, and household income distributions vary by LEA. Future projections in enrollment and anticipated family cost of care should be conducted at the LEA level to better capture local variability. Figures 6 and 7 show four-year-old participation rates, by LEA, for SY2023 using enrollment projection approach (i) discussed in the enrollment projection section of this report.

Figure 6: SY2023 Pre-K Participation Rate for Four-Year-Olds Relative to Kindergarten Enrollment, by LEA



Note: Red dashed line represents the Maryland state average participation rate for 4-year-olds in 2023.

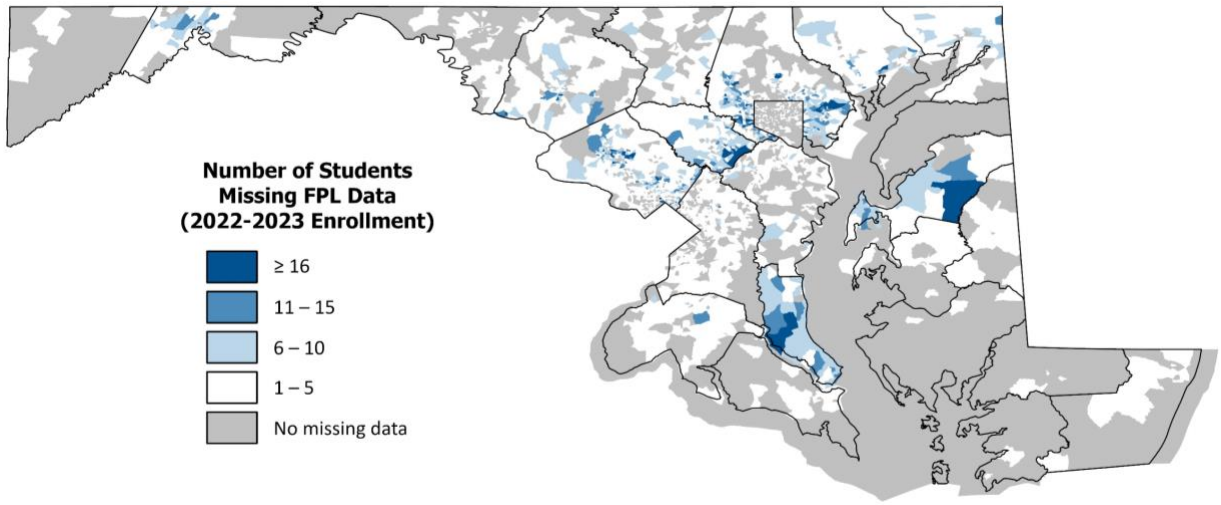
Figure 7: SY2023 Pre-Kindergarten Participation Rate for Four-Year-Olds Relative to Kindergarten Enrollment



Fourth, estimates provided in this report are based on prior data and cannot anticipate future enrollment numbers, especially considering the expansion of Pre-K under the Blueprint for Maryland's Future and the implementation of a sliding scale. These considerations are variables that cannot be accounted for in the modeling discussed in this report.

Fifth, total cost share estimates by family, state, and local governments necessitate assigning students with FPL data into Tiers or otherwise significantly underestimates cost of care. The distribution of students with missing FPL data is not homogenous across Maryland, with regional clusters in areas such as Calvert County, Queen Anne's County, and southeast Howard County (Figure 8). The accuracy of cost estimates at the LEA level is going to be proportional to these concentrations, with Kent, Dorchester, Wicomico, Somerset, Garrett, and Washington Counties having the most accurate cost estimates across Maryland due to the paucity of enrolled students with missing data.

Figure 8: Number of Students with Missing FPL Data (by Block Group)



Note: Results exclude 469 students (1.5% of all students) with missing FPL and GEOID information.

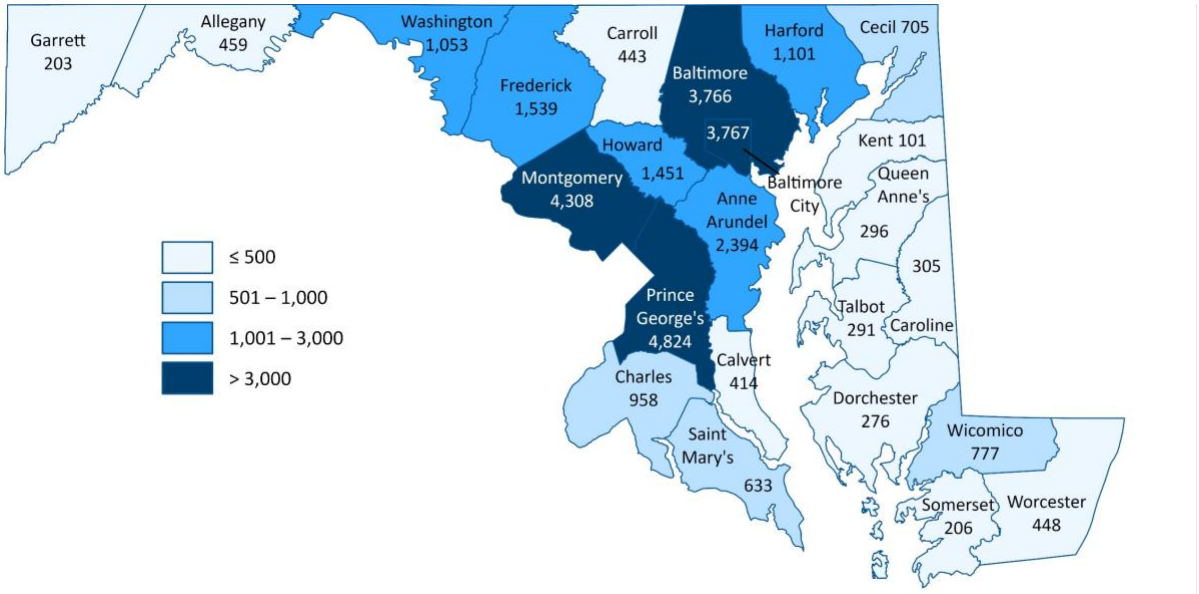
Lastly, the cost analysis of the sliding scale options presented is sensitive to changes in the cost of care and the federal poverty level through time. The results and recommendations in this report assume both factors will remain relatively consistent with time. However, if this is not the case, the cost effectiveness of Option 4 may diminish. For example, if the cost of care stagnates while the federal poverty level continues to rise, Option 4 would become more cost prohibitive because the sliding scale is based on a percentage of the family's income, whereas Options 1-3 is based on cost of care and would be largely unaffected. If FPL stagnates and the cost of care climbs, then the financial benefit of Option 4 over the first three options would improve. Given the large disparity in modeled cost of these options for Tier II families, it is unlikely that the recommendations presented here would be significantly impacted in the near future.

Appendix B: Enrollment Projections

The goal of expanding prekindergarten participation necessitates local review of sufficient space capacity and anticipation of future needs. To assist local education agencies with projection of future Pre-K enrollment, MSDE reviewed four potential methods for their strengths and weaknesses.

The research conducted in this report aggregates results at the state level, however variations in Pre-K enrollment numbers (Figure 9), enrollment rates, and Federal Poverty Level (FPL)distributions across local education agencies (LEAs) are important considerations to accurately capture space needs and cost shares for future school years. (See Appendix A for a discussion on variability across Maryland's LEAs.) Therefore, Pre-K enrollment projections should occur at the LEA level to capture this variability.

Figure 9: Maryland SY 2022-2023 Pre-Kindergarten Enrollment Numbers, by LEA



Source: MSDE September 30 Enrollment Collection

When projecting future enrollment of three- and four-year-olds in public Pre-K, there are a number of approaches that can be taken. However, each method has its own assumptions, pros, and cons that impact the accuracy and reliability of the approach. Here, an overview of four generalized approaches is outlined, with guidance for schools and LEAs on Pre-K forecasting. This is not an exhaustive list, and LEAs may use alternative models for projection not included here. The method used for data reporting in this report is described in the section "(i) Rate Relative to Kindergarten Enrollment." This method is preferred because it intrinsically accounts for population fluctuations (e.g., inward and outward mobility), it is based on absolute enrollment numbers (not based on estimates), the data sources used are the most recent out of all options (ACS and Maryland birth data lag), and it is the approach recommended by the Interagency Commission on School Construction (IAC) for forecasting future enrollment.

ENROLLMENT PROJECTION METHODOLOGIES

(i) Rate Relative to Kindergarten Enrollment

A Pre-K participation rate relative to kindergarten enrollment can be calculated using enrollment data by taking the number of three- or four-year-olds enrolled in Pre-K for a given year, divided by the enrolled number of students in kindergarten for that year. Projecting future enrollment can be completed by applying a linear regression through this data over a period of time.

Pros:

- Approach recommended by the Interagency Commission (IAC) on School Construction in forecasting future enrollment.
- Intrinsically accounts for (to a degree) external impacts on enrollment (e.g., changes in birth rates, mobility, mortality).

Cons:

- Does not account for external impactors that would affect Pre-K and not kindergarten (e.g., Pre-K policy changes and availability).
- There is a lag between when students are in Pre-K and kindergarten that is not accounted for (i.e., this approach uses two student populations rather determining rates from longitudinal datasets).

(ii) Projections from Birth Data

Annual birth data published by the Maryland Department of Health and Mental Hygiene[14] allows for projections that consider fluctuations in births from year to year. For participation rates for four-year-olds, the enrollment count for a given year can be divided by the number of births four years prior (three years prior for three-year-old rates). A regression can be applied to historical data and projected for future enrollment.

Pros:

- Approach used by the Maryland Department of Planning in forecasting future enrollment.
- Accounts for population fluctuations due to changes in birth rates over time.
- Model output matches historical data reasonably well.

Cons:

- Assumes constant rates of mortality and mobility impacting the children from birth through Pre-K enrollment.
- Projections using birth data limits how far in the future forecasting can be extended to. (Currently, Maryland birth data is published for 2021, restricting projections to SY2025.) Projection further can be conducted further (albeit with increased uncertainty) by regressing through the rates directly.

(iii) Rate Relative to American Community Survey (ACS) Population Estimates

The American Community Survey (ACS) publishes tables each year that presents population estimates disaggregated by age ranges[15]. Pre-kindergarten participation rates can be calculated by dividing the number of

[14] Data retrieved from https://opendata.maryland.gov/Demographic/Maryland-Total-Births-By-Year-2000-2021/vavn-j725.

[15] Table B09001 (Population Under 18 Years of Age). Only 5-year estimates can be used when projecting enrollment trends at the LEA level due to data suppression for certain LEAs when using 1-year estimates.

enrolled three- and four-year-old children by the estimated number for the region. The National Institute for Early Education Research (NIEER) employs a similar approach in their published participation rates for three- and four-year-olds, however they use "Single Year of Age and Sex for the Civilian Population" datasets[16] which only allows for rate determination at the state level.

A regression model of participation rates through time can be completed and used to project future enrollment based on historical trends.

Pros:

- Provides three- and four-year-old population estimates for a given year.
- Allows for enrollment projections at the LEA-level.

Cons:

- Requires use of 5-year estimates due to low counts being suppressed for some LEAs.
- Data restricted to Census-defined boundaries, preventing school-level use.
- Estimates may have large errors.
- There is a lag between when ACS data is released and current enrollment year (2021 ACS survey is the most recent reported).
- 5-year estimate data shouldn't be used for year-to-year comparisons.
- ACS tables aggregates three- and four-year-olds, so age-specific rates cannot be calculated (only state-level disaggregated data is available).

(iv) Projecting Enrollment Counts Using Excel Forecasting Function

The forecasting function in Microsoft Excel predicts future values for a time-series data set and applies a smoothing algorithm. To start, create a table listing school year and counts of three- and four-year-olds enrolled in public Pre-K. A model can be run by selecting "Forecast Sheet" from the "Data" tab in Microsoft Excel. Once a forecast end date is selected, the model can be run by clicking "Create". Resulting projections and confidence intervals are generated for the dataset.

Pros:

- Uses enrollment numbers directly for forecasting (no rate considerations).
- Can be completed for three- and four-year-olds.
- Confidence intervals give the user an indication of the quality of the projection.
- One of the simplest approaches.

Cons:

- Does not account for external impactors (changes in birth rates, mobility, mortality, changes in Pre-K policy, availability, etc.).

[16] Single year datasets for April 1, 2010 to July 1, 2020 can be downloaded at https://www.census.gov/programs-surveys/popest/technical-documentation/research/evaluation-estimates/2020-evaluation-estimates/2010s-state-detail.html.

Appendix C: Tier II Cost Structure by Family Size

The Tier II sliding scale options are structured by Federal Poverty Level (FPL), a poverty metric which is published annually by the U.S. Department of Health and Human Services (HHS). Poverty guidelines for the 48 Contiguous States are defined by the number of persons in the family/household. Because family size information is not collected with student enrollment data, this report assumes a family size of four.

Table 16 shows the impact of family size on the family share, per child, for prekindergarten childcare. For example, a household with a family size of five with an annual income of $129,880 (i.e., 400% the FPL for a family of five) may contribute 2% of their annual income to the cost of care (or $2,598) per child enrolled in Maryland Pre-K. For comparison, a family of four with the same annual income may contribute 4% of their annual income (or $5,195) per child.

Table 16: Tier II Cost Structure for Family Size Between 3 and 5 Persons

Family Size				3		4		5	
FY 2022 Federal Poverty Level*				$23,090		$27,750		$32,470	
Tier	Level	FPL	% of Income	Annual Income	Family Share	Annual Income	Family Share	Annual Income	Family Share
Tier I	-	≤300%	0%	≤$69,090	$0	≤$83,250	$0	≤$97,410	$0
Tier II	1	301%	1%	$69,320	$693	$83,528	$835	$97,735	$977
Tier II	1	310%	1%	$71,393	$714	$86,025	$860	$100,657	$1,007
Tier II	1	320%	1%	$73,696	$737	$88,800	$888	$103,904	$1,039
Tier II	1	330%	1%	$75,999	$760	$91,575	$916	$107,151	$1,072
Tier II	1	340%	1%	$78,302	$783	$94,350	$944	$110,398	$1,104
Tier II	1	350%	1%	$80,605	$806	$97,125	$971	$113,645	$1,136
Tier II	1	360%	1%	$82,908	$829	$99,900	$999	$116,892	$1,169
Tier II	2	370%	2%	$85,211	$1,704	$102,675	$2,054	$120,139	$2,403
Tier II	2	380%	2%	$87,514	$1,750	$105,450	$2,109	$123,386	$2,468
Tier II	2	390%	2%	$89,817	$1,796	$108,225	$2,165	$126,633	$2,533
Tier II	2	400%	2%	$92,120	$1,842	$111,000	$2,220	$129,880	$2,598
Tier II	2	410%	2%	$94,423	$1,888	$113,775	$2,276	$133,127	$2,663

Family Size				3		4		5	
FY 2022 Federal Poverty Level*				$23,090		$27,750		$32,470	
Tier	Level	FPL	% of Income	Annual Income	Family Share	Annual Income	Family Share	Annual Income	Family Share
Tier II	2	420%	2%	$96,726	$1,935	$116,550	$2,331	$136,374	$2,727
Tier II	3	430%	4%	$99,029	$3,961	$119,325	$4,773	$139,621	$5,585
Tier II	3	440%	4%	$101,332	$4,053	$122,100	$4,884	$142,868	$5,715
Tier II	3	450%	4%	$103,635	$4,145	$124,875	$4,995	$146,115	$5,845
Tier II	3	460%	4%	$105,938	$4,238	$127,650	$5,106	$149,362	$5,974
Tier II	3	470%	4%	$108,241	$4,330	$130,425	$5,217	$152,609	$6,104
Tier II	3	480%	4%	$110,544	$4,422	$133,200	$5,328	$155,856	$6,234
Tier II	4	490%	6%	$112,847	$6,771	$135,975	$8,159	$159,103	$9,546
Tier II	4	500%	6%	$115,150	$6,909	$138,750	$8,325	$162,350	$9,741
Tier II	4	510%	6%	$117,453	$7,047	$141,525	$8,492	$165,597	$9,936
Tier II	4	520%	6%	$119,756	$7,185	$144,300	$8,658	$168,844	$10,131
Tier II	4	530%	6%	$122,059	$7,324	$147,075	$8,825	$172,091	$10,325
Tier II	4	540%	6%	$124,362	$7,462	$149,850	$8,991	$175,338	$10,520
Tier II	5	550%	7%	$126,665	$8,867	$152,625	$10,684	$178,585	$12,501
Tier II	5	560%	7%	$128,968	$9,028	$155,400	$10,878	$181,832	$12,728
Tier II	5	570%	7%	$131,271	$9,189	$158,175	$11,072	$185,079	$12,956
Tier II	5	580%	7%	$133,574	$9,350	$160,950	$11,267	$188,326	$13,003
Tier II	5	590%	7%	$135,877	$9,511	$163,725	$11,461	$191,573	$13,003
Tier II	5	600%	7%	$138,180	$9,673	$166,500	$11,655	$194,820	$13,003
Tier III	-	≥601%	-	≥$138,410	$13,003	≥$166,778	$13,003	≥$195,145	$13,003

Calculations use FY 2025 estimated cost of care of $13,003 per child.

Table 17 shows the 2022 HHS poverty guidelines and can be used to estimate a family's cost of care for any family size.

Table 17: 2022 Poverty Guidelines for the 48 Contiguous States and the District of Columbia

Persons in Family/Household	Federal Poverty Level	300% Federal Poverty Level	600% Federal Poverty Level
1	$13,590	$40,770	$81,540
2	$18,310	$54,930	$109,860
3	$23,030	$69,090	$138,180
4	$27,750	$83,250	$166,500
5	$32,470	$97,410	$194,820
6	$37,190	$111,570	$223,140
7	$41,910	$125,730	$251,460
8	$46,630	$139,890	$279,780

Note: For families/households with more than 8 persons, add $4,720 for each additional person.