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Missing the Mark

How Chapter 70 Education Aid Distribution Benefits Wealthier School Districts and Widens Equity Gaps

Massachusetts
Business Alliance
for Education



AUTHORSHIP

This working paper was authored by Ryan Flynn (rflynn@mbae.org) and James Sutherland, PhD (jsutherland@bostonchamber.com).

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Preface from MBAE and GBCC

Dear Friend of Education,

It is imperative, in the face of increasing income inequality, economic uncertainty, and the growing challenge for businesses to hire talented and skilled employees, that Massachusetts has public schools that provide a high-quality education to each and every student. That requires appropriate funding.

Beginning with the creation of the 1993 Education Reform Act's Chapter 70 funding formula and continuing through the passage of last year's Student Opportunity Act (SOA), the state has partnered with communities to provide funding for schools based on students' needs. The formula targets state resources to make up the difference between what an adequate education costs and what a local community can afford. However, over time, deviations from that progressive concept of having state funds equalize local educational opportunity have caused growing amounts of state funding to be distributed to higher wealth communities to ensure that "every community receives something."

In this report, **Missing the Mark: How Chapter 70 Education Aid Distribution Benefits Wealthier School Districts and Widens Equity Gaps**, which our organizations jointly produced, we find that \$778 million in the fiscal year 2021 budget proposal, or 14% of the total annual state Chapter 70 appropriation to aid public schools, goes to districts regardless of their ability to fund K-12 education on their own. Much of that total, almost \$500 million a year, goes to the wealthiest 20% of school districts in Massachusetts, which serve cities and towns with a level of wealth that the formula recognizes as giving them the capacity to fully fund their school budgets from local revenues.

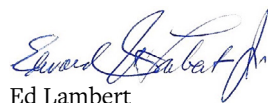
This is state money that could otherwise be used to accelerate increases in funding to higher needs districts that do not have the capacity to fully fund their schools. It is funding that could be used to close yawning gaps in opportunity and achievement for high-needs and low-income students, gaps that have likely been widened by the recent school closures related to the COVID-19 pandemic. Efforts taken now to roll back some of these nonprogressive funding elements could produce the money necessary to close the digital divide that has consigned so many lower income students to a dangerous loss of learning and instruction that threatens their economic future.

Although it may be understandable how, when financial times were better, formula changes that increased Chapter 70 aid without regard to underlying student and community need could be justified as practically and politically expedient, the state is entering an urgent period of much greater uncertainty that requires a reexamination of these changes.

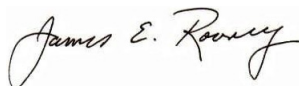
The combination of unmet student need (which, even by the rosier estimates in the SOA, would take 7 years for the Commonwealth to fully fund), and the new financial circumstances and ensuing economic fallout created by the pandemic, requires that we revisit whether Massachusetts should continue to subsidize wealthier communities at the expense of students still waiting for equity in educational opportunity.

The Chapter 70 formula is complex and multifaceted. We recognize that changes to address one perceived problem can create unintended consequences that impact other communities in negative ways. We understand that some rural and other districts have unique circumstances that must be accounted for.

Rather than call for an immediate end to the elements of the Chapter 70 aid formula highlighted in this report, we recommend beginning to roll them back in ways that advance the original intent of the formula as a vehicle for filling funding gaps in communities where the need exists.



Ed Lambert
Executive Director
Massachusetts Business Alliance for Education



James E. Rooney
President & CEO
Greater Boston Chamber of Commerce

Executive Summary

Closing racial and socioeconomic achievement gaps in education is an urgent priority in Massachusetts. Across almost every indicator of student opportunity and achievement—from high school graduation rates to performance on Advanced Placement exams, to access to a college readiness course of study—Black and Latinx students, English learners, students with disabilities, and students from low-income backgrounds do not enjoy the same outcomes as their peers. Equitable access to resources is an important component of the effort to close these gaps.

The state foundation budget formula for K-12 education determines how much money a school district must spend per student to provide an adequate education. The formula is designed to provide additional resources for those students with greater needs by allocating more money for low-income students, English language learners, and students with a disability. In 2014, a state commission called the Foundation Budget Review Commission (FBRC) found that Massachusetts was short-changing its higher needs students by underestimating the cost of providing them an adequate education. Wealthy communities have addressed this gap by tapping into local revenue sources to spend more than required under the foundation formula, resulting in significantly greater spending per student when compared with less wealthy communities. The Student Opportunity Act (SOA), passed in 2019, seeks to address this issue by altering the foundation budget formula to better reflect the actual cost of providing an adequate education and phasing in these changes over 7 years. These changes will provide additional money to close achievement gaps in K-12 education, particularly to districts with greater numbers of high-needs students.

The responsibility for funding each school district's foundation budget is shared by the state and municipalities. The Chapter 70 state education aid formula, created as part of landmark 1993 education reform that sought to address significant disparities in access to high quality education related to overreliance on local revenues to fund schools, determines the share of each school district's foundation budget that must be contributed by the municipality or municipalities it serves. The state provides the remainder to each school district in the form of Chapter 70 state education aid. Governor Baker's fiscal year (FY) 2021 budget proposal (House 2 or H.2) provides \$5.48 billion in Chapter

70 aid to support a statewide foundation budget of \$11.95 billion. Collectively, municipalities are required to contribute a total of at least \$6.79 billion to meet their foundation budget spending requirements.

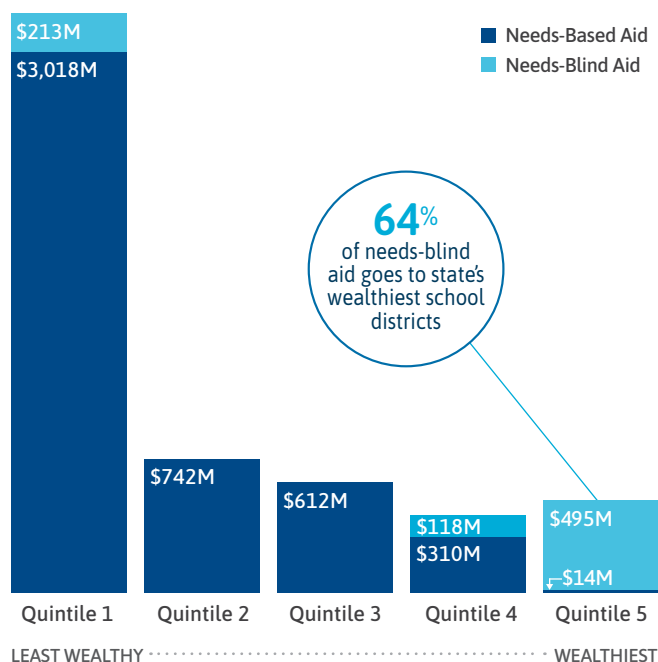
The Chapter 70 aid formula is designed to be progressive, using state dollars to fund a larger share of total required spending in less affluent school districts. The SOA did not significantly alter the Chapter 70 aid formula. Instead, the Legislature tasked the Department of Elementary and Secondary Education and the Department of Revenue with reviewing specific elements of this formula. In line with the Legislature's call for additional review, we conducted an analysis to determine if the Chapter 70 aid formula helps or hinders the goal of directing adequate resources to high-needs students.

In the FY 2021 H.2 budget proposal, \$778 million, or 14% of total Chapter 70 aid, is distributed as a result of Chapter 70 aid formula factors that are not based on community wealth and income. 64% of every needs-blind dollar goes to the wealthiest 20% of school districts.

This analysis shows that Massachusetts distributes to wealthier school districts more aid than their formula-determined need at the expense of increasing resources to low-income communities. In the FY 2021 H.2 budget proposal, \$778 million, or 14% of total Chapter 70 aid, is distributed as a result of Chapter 70 aid formula factors that are not based on community wealth and income. These factors, many added to the formula during previous reforms to build political support by ensuring that nearly every community received more money than before, are essentially needs-blind in that they do not account for a community's capacity to provide an adequate education. Under the current FY 2021 proposal, 64% of every needs-blind dollar goes to the wealthiest 20% of school districts in the Commonwealth (Figure 1).

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Figure 1: Chapter 70 Aid by School District Wealth Quintile (FY 2021 H.2)¹



Source: Authors' calculations using school finance data from the Massachusetts Department of Elementary and Secondary Education (2020a).

Massachusetts is at a critical juncture in education funding reform. Because the SOA does not provide a pathway for raising additional revenue, the task of identifying the resources necessary to meet SOA spending obligations falls to state and local budget writers. In July 2020, legislators committed to providing schools with FY 2020 levels of Chapter 70 aid plus an inflationary adjustment for the coming FY 2021 school year while opting to delay passing a FY 2021 budget in the face of uncertainty caused by COVID-19. The severe pressure that COVID-19 places on the state's fiscal landscape likely hampers planned SOA-driven foundation budget increases for years to come. During this unprecedented budget cycle, the state must be creative in how it leverages its drastically reduced resources. Faced with difficult financial choices, Massachusetts would be wise to consider how needs-blind state aid currently sent to its wealthiest communities could be better directed toward low-income students and communities to help close the decades-long achievement and opportunity gaps the FBRC recommended

addressing with additional funding. It is prudent to address these inequities now, in light of the current fiscal crisis, both to ensure the maximum possible funding for high-needs communities and to better align the state's total investment in K-12 education with student need.

Policy Recommendations

Based on the findings described in this policy paper, we provide four recommendations to make the Chapter 70 aid formula more equitable. These recommendations can be addressed now, in conjunction with revisions to the foundation budget formula made by the SOA. Although these four items do not lead to a fully needs-based Chapter 70 aid calculation, they are impactful steps that ensure funding reaches those students who need it most.

1. **Incrementally phase out the hold-harmless provision.** The hold-harmless provision guarantees that districts receive at least the same amount of Chapter 70 aid as the previous year even when their foundation budgets decrease. Chapter 70 aid attributable to the hold-harmless factor is equal to \$319 million in H.2, with the wealthiest school districts receiving approximately 5 times more state aid attributable to the hold-harmless factor per student than the least wealthy. Many middle-wealth school districts, particularly rural areas with declining enrollment, also rely on this formula factor. These districts often face challenges related to diseconomies of scale that cause costs per student to be higher than contemplated in the foundation budget formula. The phase-out of the hold-harmless provision should proceed in parallel with a set of reviews, required under the SOA, related to assessing the long-term fiscal health of those rural school districts with declining enrollment.
2. **Phase out minimum aid.** Minimum aid provides a flat per-student increase in state aid to districts in years when all other foundation budget and Chapter 70 formula factors do not generate an aid increase. The proposed FY 2021 minimum aid rate is \$30 per student, accounting for \$11.9 million in Chapter 70 state aid, with the wealthiest communities receiving more than 6 times more minimum aid per student than the lowest resourced school districts.

¹ Needs-blind aid includes aid attributable to the hold-harmless provision, minimum aid, below-effort aid, aid attributable to the floor for the wage adjustment factor, and the cap on municipalities' maximum local contribution share of their foundation budgets. Although Quintile 1 districts receive much more Chapter 70 aid, Quintile 5 districts still spend more on education per pupil because those communities have the local resources to do so; this inequity was the basis of the SOA.

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3. **Eliminate below-effort aid to municipalities that have the capacity to fund 125% or more of their foundation budgets.** The state calculates a target percentage for each municipality's share of its school districts' total required spending. Under certain circumstances, the state allows municipalities to fall short of this target, filling the shortfall with state aid. This below-effort aid accounts for \$156 million in Chapter 70 aid in the FY 2021 budget proposal. Currently, below-effort aid benefits low-income communities more than wealthier ones and therefore should not be removed entirely, at least until the full implementation of the SOA reforms. However, the state should stop providing below-effort aid to better resourced communities that can afford to fund 125% or more of their school districts' budgets from local revenue alone. Doing so will free up \$1 million with no impact on the lowest resourced school districts. More important, this measure improves progressivity of the state aid formula.
4. **Increase the maximum required local contribution toward school district budgets** that wealthy municipalities are expected to make. A municipality's local contribution to its schools is capped at 82.5% of its foundation budget. For FY 2021, the state calculates that 104 of Massachusetts' 351 municipalities can afford to fund their schools entirely from local resources. The net effect of raising the maximum required local contribution from 82.5% to 100% of a municipality's foundation budget is a Chapter 70 aid increase of \$221 million statewide, with the lowest resourced school districts gaining \$82 million in aid and the wealthiest school districts seeing an aid reduction of \$4 million. A more incremental increase in the maximum required contribution share yields a progressive, but smaller, effect.

Introduction

In November 2019, Massachusetts passed the Student Opportunity Act (SOA), a landmark education funding reform bill. Support for the reform was motivated by two facts. First, the cost of specific inputs— particularly staff health care and the educators, materials, and services needed to fully meet the needs of low-income students, English learners, and students with disabilities—exceeds what the state’s funding formula assumed was needed for those purposes. Second, the underestimated cost of providing every student with the resources needed for a high-quality education contributed, over time, to stark inequalities in access to resources and opportunity across school districts. Although wealthier districts can meet the demand to spend beyond what the funding formula requires, less wealthy districts struggle to increase spending in line with need, resulting in serious deprivation that disproportionately affects Black, Latinx, and high-needs students. In fiscal year 2019 (FY 2019), the wealthiest quintile of districts spent an average of \$4,642 more per student than did the least wealthy quintile of districts. The SOA addresses both issues directly by dramatically increasing state aid and required local spending on education.

Although the changes to Massachusetts’ funding formula contained in the SOA are expected to make significant contributions to providing more vulnerable students with needed resources, the originally envisioned 7-year phase-in means that, under ideal circumstances and without the fiscal impacts of COVID-19, it will still take more than half a K-12 career for this relief to be fully realized. The expected stress on state revenue resulting from COVID-19 and widespread economic slowdown may jeopardize or lengthen this incremental phase-in. There is a risk that many of the Commonwealth’s highest-needs districts will not receive increased funding as quickly as they had expected when the SOA passed.

Although historic in scope, the SOA left untouched several aspects of the state’s education funding formula that determines how much state aid flows to districts and how this aid is shared among communities. The Foundation Budget Review Commission (FBRC), whose findings formed the basis for the SOA, did not study these formula factors. Several of these factors are needs-blind: They influence the distribution of Chapter 70 state education aid among school districts but do not account for the availability of local resources based on communities’ property wealth and income.

This paper examines the impact of these factors and finds that some of them make the overall distribution of Chapter 70 aid less progressive. Each year, the state distributes more aid to wealthier districts than what they need at the expense of increasing resources to low-income communities. Under the FY 2021 budget proposal (House 2 or H.2), 14% of the total \$5.48 billion Chapter 70 aid allocation, approximately \$778 million, is distributed as a result of needs-blind factors that are not based on municipalities’ capacity to contribute to their schools. About 64% of every needs-blind dollar in Chapter 70 aid is targeted to the wealthiest 20% of school districts.

This needs-blind aid often is explained as the sweetener needed to pass progressive education reform; however, in the context of incremental phase-in of funding increases or delayed SOA implementation as the state budget recovers from COVID-19 in the coming years, changes to the needs-blind elements of the Chapter 70 state education aid calculation could strategically shift some funding to shield the lowest income districts from the full force of continued underfunding while not substantially affecting the ability of wealthy districts to provide for their students.

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The Foundation Budget and Chapter 70 State Education Aid Calculations

The Massachusetts school funding system is designed to ensure that state funding is progressive, both by allocating more money for students with higher needs through a *foundation budget formula*² and by using state dollars to pick up a larger share of funding for less affluent districts through the *Chapter 70 state education aid formula*. The SOA recently made substantial changes to the foundation budget formula based on recommendations by the FBRC, which convened in 2014 to review the programs, services, and costs associated with providing adequate education and to make recommendations for formula changes. These changes will increase the amount of *Chapter 70 state education aid* by an estimated \$1.4 billion when fully implemented. The FY 2021 H.2 budget proposal—developed before the COVID-19 outbreak—allocates almost

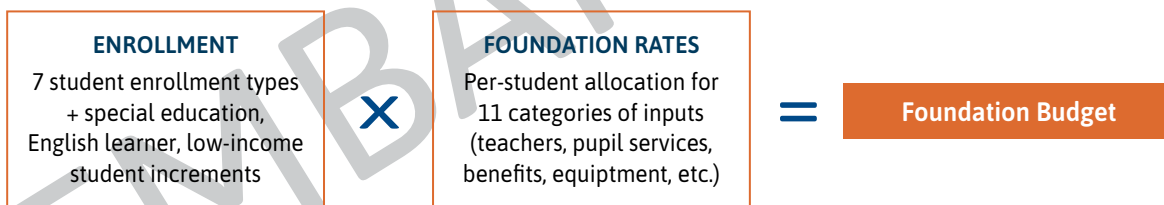
\$5.48 billion to Chapter 70 state education aid. This amounts to a \$304 million, or 5.9%, increase in Chapter 70 aid compared with that of FY 2020.

The foundation budget calculation determines the amount of money needed to provide students an adequate education, but the Chapter 70 aid calculation, a separate formula, determines the distribution of aid among communities. The FBRC did not deeply examine how state aid is shared among school districts. We, therefore, conducted this analysis of the Chapter 70 aid formula, which determines how great a share of each school district's budget should be paid for with state education aid, a separate step from determining how much each district must spend to meet the needs of its students (see Box 1).

Box 1: Summarizing the Foundation Budget and Chapter 70 Aid Calculations

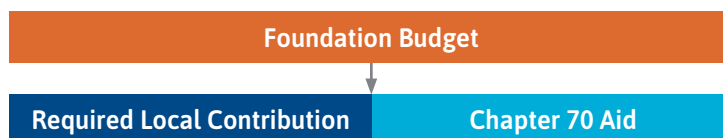
Required state and local spending on K-12 education is determined by two calculations: a foundation budget calculation and a Chapter 70 aid calculation.

FOUNDATION BUDGET CALCULATION



First, the Commonwealth calculates the amount that each district must spend to provide an adequate education for its students, or foundation budget, based on enrollment, student demographics, and wage levels.

CHAPTER 70 AID CALCULATION



Next, the Commonwealth determines the share of each school district's foundation budget that must be paid for by the municipality or municipalities the district serves, based on each municipality's aggregate property values and residents' income. More affluent municipalities are required to pay for a greater share of their school districts' foundation budgets. Chapter 70 state aid fills the gap between the local contribution and the total foundation budget amount. However, the Chapter 70 aid formula includes several elements that deviate from this needs-based funding principle. This paper describes these elements.

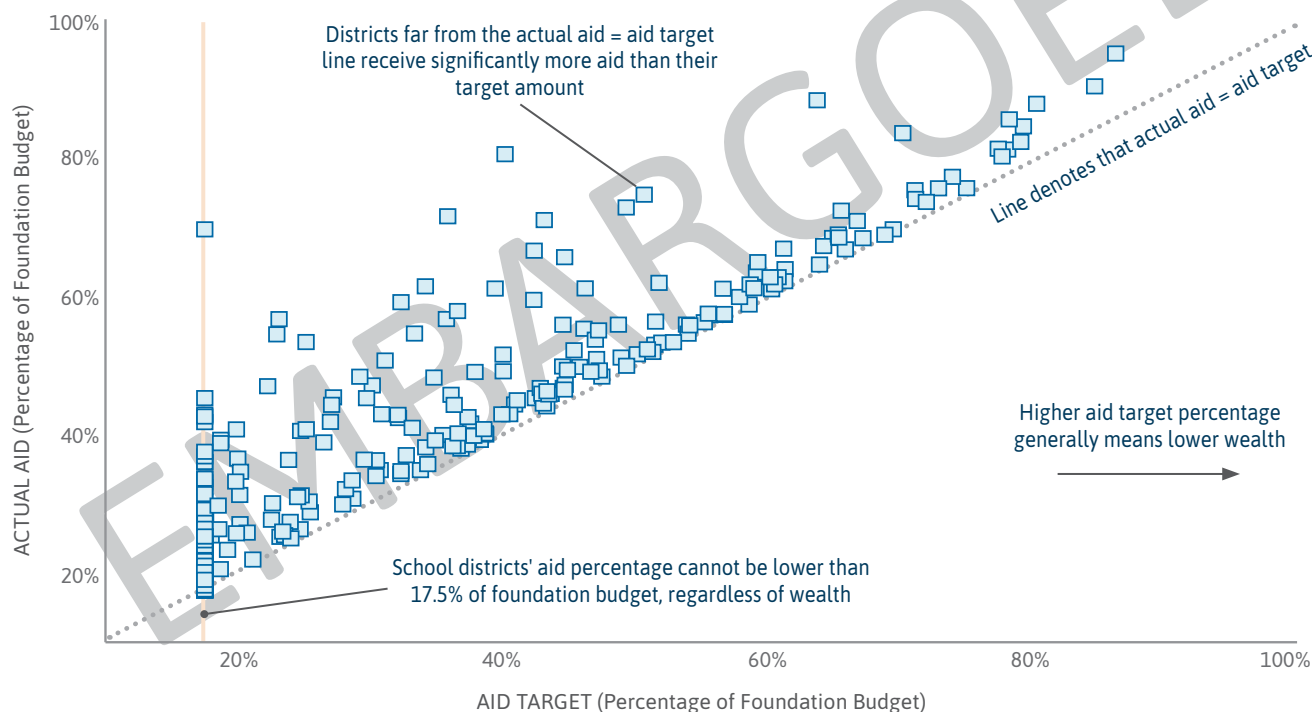
² Terms in *bold italics* are defined in the glossary in Appendix 1. They are technical terms that have a specific meaning in the state foundation budget or Chapter 70 aid calculations.

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The Chapter 70 aid calculation first determines each municipality's **required local contribution** to the school district or districts that serve resident students. The calculation starts with each municipality's required local contribution from the prior fiscal year and increases it by a **municipal revenue growth factor**, which is calculated annually for each municipality by the Department of Revenue and estimates the growth in capacity to collect local revenue to spend on education. This yields each community's **preliminary local contribution**. The Chapter 70 aid calculation then compares the preliminary local contribution amount to the **target local contribution**, the share of each municipality's foundation budget that the state has calculated should be funded from local contributions based on the municipality's property wealth and residents' income. In practice,

a municipality's preliminary and target local contributions are never exactly equal. If a municipality's preliminary local contribution is greater than its target local contribution, the state reduces the municipality's required contribution to the target amount.³ If a municipality's preliminary local contribution is less than its target local contribution, the state provides **below-effort aid** to make up the difference between the community's target and required contributions. In these communities, the preliminary local contribution amount becomes the required local contribution.⁴ Having determined a municipality's required local contribution, the state then divides the contribution among the school districts to which the municipality belongs based on the municipality's share of the total foundation budgets for the district(s) to which it sends students.

Figure 2: School Districts' Target and Actual Chapter 70 Aid as a Percentage of Their Foundation Budgets (FY 2021 H.2)



Source: Massachusetts Department of Elementary and Secondary Education (2020a).

- 3 Before FY 2019, above-target municipalities' contributions were reduced by a percentage of the difference between their preliminary local contribution and their target local contribution. The SOA requires that the preliminary local contribution reduction percentage be set in the state budget each year, meaning that in future years it is possible that above-target municipal contributions may not be fully reduced to target.
- 4 When the difference between a municipality's target local contribution and preliminary local contribution would exceed 2.5% of the municipality's foundation budget, the municipality is required to increase its local contribution by an amount equal to 1% of the prior year's required local contribution. If the difference between its target and preliminary contributions exceeds 7.5% of the municipality's foundation budget, the municipality is required to increase its local contribution by an amount equal to 2% of the prior year's required local contribution. In these cases, the required local contribution is greater than the preliminary local contribution but less than the target local contribution. A municipality with the capacity to fund 175% or more of its foundation budget from local revenue is not eligible for below-effort aid, regardless of the difference between its target and preliminary local contribution.

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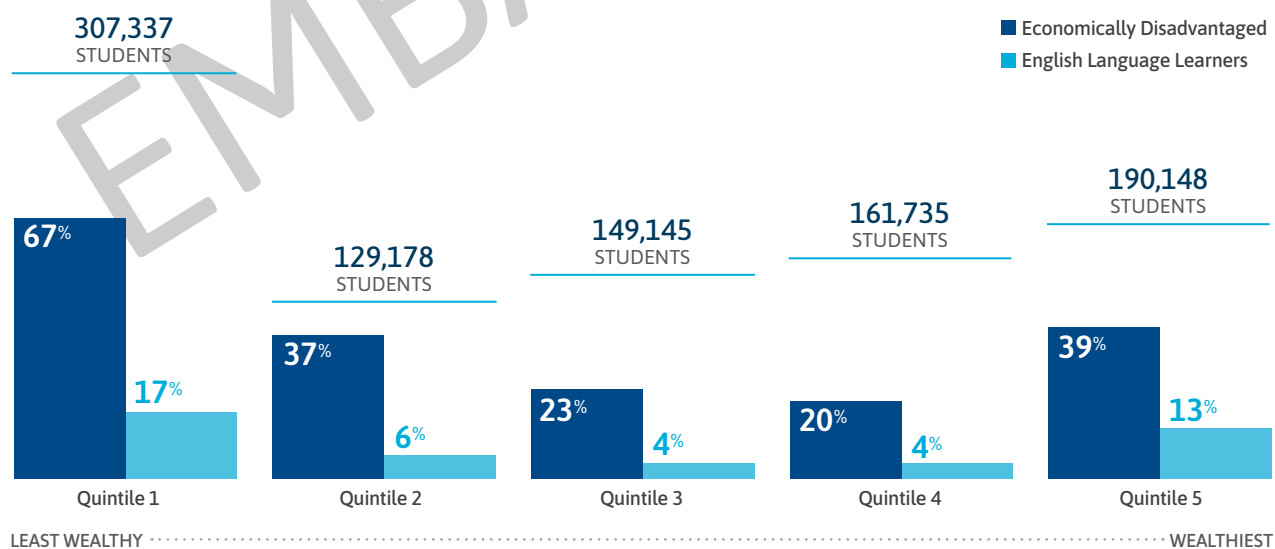
The state next determines how much Chapter 70 state aid each district needs by calculating the difference between each district's foundation budget and the required local contribution to which that district is entitled. The state provides *foundation aid* to cover the difference between a school district's foundation budget and required local contribution. Foundation aid has several parts. The first part is *base aid*, which is the amount of aid the district received in the prior fiscal year. Importantly, districts are *held harmless*, meaning that total Chapter 70 aid in the current year cannot be less than base aid. If the difference between a district's required local contribution and its foundation aid is greater than base aid, then the district receives a foundation aid increase equal to the difference between foundation aid and base aid. If a district does not get a foundation aid increase, then the district receives *minimum aid*. Minimum

aid is a guaranteed increase in funding each year, often calculated on a per-pupil basis. The FY 2021 H.2 proposal includes a \$30 per-pupil minimum aid increase. Districts that receive a foundation aid increase smaller than their minimum aid entitlement also receive minimum aid up to the full entitlement amount.

Aspects of the Chapter 70 aid calculation, including the hold-harmless provision and minimum aid, create disparities in the distribution of aid and move the formula away from its intended goal of creating a needs-based funding structure. As Figure 2 shows, many school districts end up receiving aid above their target amount, which is based on the formula's calculation of what the school district needs. In H.2's FY 2021 recommendations, 262 operating districts (out of 318) would

Box 2: School District Quintiles

For this analysis, school districts are divided into five equal groups, or quintiles, based on the ratio of wealth and income of the municipality(ies) the school district serves to the school district's foundation budget. Quintile 1 represents the 20% of districts with the lowest community wealth relative to school funding needs, and Quintile 5 represents the 20% of districts with the highest community wealth relative to school funding needs. This analysis includes all 318 operational, noncharter school districts in Massachusetts, so each quintile contains 63 or 64 school districts. The higher rates of economically disadvantaged students and English language learners in Quintile 5, when compared with those of Quintiles 2 through 4, is due to Boston, Cambridge, and Somerville, cities with substantial property wealth and income whose school districts serve large numbers of high-needs students.



Source: Authors' calculations using K-12 enrollment data from the Massachusetts Department of Elementary and Secondary Education, (2020c).

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receive aid that is at least 1 percentage point greater than their target level of aid. In total, the state would distribute \$579 million in aid above the target set by the Chapter 70 aid formula.⁵

A needs-based Chapter 70 aid formula would match a community's required local contribution to the amount the community can afford to pay from local resources. A fully needs-based Chapter 70 aid formula would not include several needs-blind formula factors, such as the hold-harmless provision, minimum aid, below-effort aid, or a floor for the *wage adjustment factor (WAF)*,⁶ and it would require communities with the capacity to fully fund their schools via local contributions to do so.

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5 This amount is different from the \$778 million mentioned above because some of the needs-blind factors examined in this paper also affect the target set by the formula and/or the foundation budget calculation itself. For example, the formula element that sets a maximum required local contribution share of 82.5% of a municipality's foundation budget would lower the target amount of state aid to those communities by requiring a greater local contribution.

6 The WAF alters the foundation budget allotments to reflect differences in the average annual wages in different labor markets across the state.

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The Impact of Needs-Blind Factors in the Distribution of Chapter 70 Aid

The wealthiest school districts in the Commonwealth benefit the most from the needs-blind factors in the Chapter 70 aid formula. Figure 3 compares proposed FY 2021 funding by district quintile (see Box 2) with the funding that districts would receive under a formula that removes needs-blind factors (see Appendix 2 for more details on the methodology). Under a fully needs-based formula, Chapter 70 state aid is reduced by 14%, or just under \$778 million, compared with the FY 2021 proposed expenditures in H.2. Of this reduction in aid, 64% comes from the wealthiest 20% of school districts.

By using a more progressive needs-based formula, the state could better leverage this money by spending it in low-income communities and on efforts that help close achievement gaps. Making a substantial change to the Chapter 70 aid formula will be difficult for districts and the state alike. Progress toward a fully needs-based distribution of Chapter 70 aid could be achieved through incremental changes, including the adjustments to the formula outlined in the policy recommendations. Altering regressive elements of the formula, in coordination with implementing the increases in funding enshrined in the SOA, will help address continued underfunding in light of the

growing fiscal crisis and allow for more rapid progress to the new spending levels required in low-income communities.

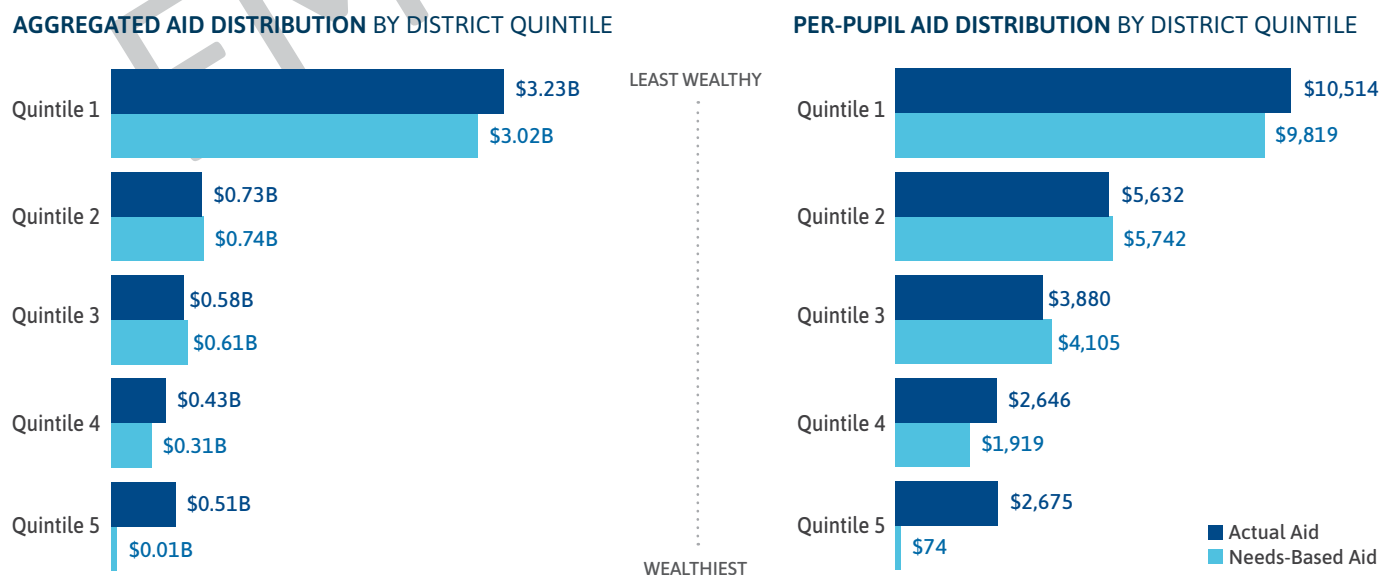
In this section, we examine the impact of needs-blind formula elements on the amount and distribution of Chapter 70 aid.

Hold-Harmless Provision

The hold-harmless provision applies when a school district's Chapter 70 aid from the previous year, called base aid, is higher than the amount of foundation aid called for by the current year's Chapter 70 aid calculation. When this occurs, the district receives the entirety of its base aid amount; the state effectively holds the district harmless to changes in enrollment or required local contributions that would otherwise cause its Chapter 70 state aid to fall. In the FY 2021 budget proposal, 186 school districts, 59% of all operating districts, benefit from the hold-harmless provision.

Chapter 70 aid attributable to the hold-harmless provision is equal to \$319 million in the FY 2021 budget proposal, or \$340 per student statewide. Table 1 shows that the wealthiest communities receive more than 5 times as much per student in

Figure 3: Comparison of Actual and Needs-Based State Aid by District Quintile (FY 2021 H.2)



Source: Authors' calculations.

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hold-harmless base aid than the lowest wealth communities; a significant number of middle-wealth communities, particularly in Quintile 3, also benefit. A disproportionate number of the middle-wealth districts that benefit from the hold-harmless provision have seen declining enrollment for several years. Also, many of these districts are located in rural areas, adding challenges related to serving a dispersed student population to declining enrollment.

Table 1: Chapter 70 State Aid Attributable to the Hold-Harmless Provision (FY 2021 H.2)

		AGGREGATE	PER PUPIL	DISTRICTS BENEFITING
LEAST WEALTHY WEALTHIEST	Quintile 1	\$19,204,566	\$62	17
	Quintile 2	\$45,296,348	\$351	34
	Quintile 3	\$126,363,475	\$847	53
	Quintile 4	\$69,557,514	\$430	43
	Quintile 5	\$58,777,255	\$309	39

Source: Authors' calculations.

Minimum Aid

Minimum aid guarantees a minimum per-pupil increase in Chapter 70 aid for districts that do not receive a sufficiently large foundation aid increase. The Legislature sets the minimum aid rate each year. Over the past 10 years, the rate has fluctuated between \$55 per student at its peak in FY 2017 and a low of \$0 per student in FY 2010 through FY 2012. The SOA requires that the minimum aid rate be at least \$30 per student each year. In the FY 2021 budget proposal, the minimum aid rate is \$30 per student and 186 school districts, 59% of all operating districts, receive minimum aid.

In FY 2021, Chapter 70 aid attributable to the minimum aid provision is equal to \$11.9 million. Minimum aid is regressive. Table 2 shows that, on a per-student basis, the lowest wealth quintile of districts receives the smallest amount of minimum aid, both in aggregate and per pupil. The wealthiest communities receive 10 times more minimum aid per pupil than the poorest. Quintile 3 districts receive more than 11 times as much minimum aid per student than the poorest districts. Because of this regressive distribution, any decision by the Legislature to

increase the minimum aid rate would decrease the progressivity of Chapter 70 aid.

Table 2: Chapter 70 State Aid Attributable to Minimum Aid (FY 2021 H.2)

		AGGREGATE	PER PUPIL	DISTRICTS BENEFITING
LEAST WEALTHY WEALTHIEST	Quintile 1	\$741,840	\$2	17
	Quintile 2	\$1,631,112	\$13	34
	Quintile 3	\$3,229,907	\$22	53
	Quintile 4	\$2,489,190	\$15	43
	Quintile 5	\$3,836,138	\$20	39

Source: Authors' calculations.

Below-Effort Aid

Generally, required contributions by municipalities to their school districts' budgets are not allowed to increase more than a fixed percentage each year, regardless of changes to their foundation budget. The maximum percentage increase is based on the municipal revenue growth factor (MRGF), which is calculated by the Department of Revenue each year and estimates the growth in each municipality's capacity to fund education. Inclusion of the MRGF in the Chapter 70 aid formula prevents municipalities from absorbing large required contribution increases in just 1 year, which could potentially strain municipal budgets. Each municipality's prior-year required contribution is increased by that municipality's MRGF to yield a preliminary contribution, which may be adjusted, as described in the section explaining the foundation budget and Chapter 70 aid calculations, to set a required local contribution amount.

When a municipality's required contribution is less than its target contribution, the community is considered "below target." School districts serving communities whose required local contribution are less than their target local contribution still need to be able to spend at the level required by their foundation budget. When their spending requirement would otherwise fall short of the level required by their foundation budget, the state provides additional aid to make up the shortfall. We call this type of aid below-effort aid because it allows communities to exert a lower level of tax effort to support their schools than

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their target local contribution would imply. Below-effort aid accounts for \$156 million in Chapter 70 aid in the FY 2021 proposal, or \$166 per student. Table 3 demonstrates that, although below-effort aid is needs-blind in the sense that it is not based on student need or community wealth, the effect of allowing districts to be below target is progressive, as 76% of below-effort aid goes to Quintile 1 districts.

Table 3: Chapter 70 Aid Attributable to Below-Effort Aid (FY 2021 H.2)

	AGGREGATE	PER PUPIL	DISTRICTS BENEFITING
LEAST WEALTHY			
Quintile 1	\$118,721,987	\$386	45
Quintile 2	\$15,642,698	\$121	29
Quintile 3	\$8,964,587	\$60	11
Quintile 4	\$11,074,016	\$68	17
WEALTHIEST			
Quintile 5	\$1,246,427	\$7	9

Source: Authors' calculations.

Wage Adjustment Factor (WAF)

The WAF alters the foundation budget allotments related to staffing to reflect differences in the average annual wages in different labor market areas across the state. The rationale is to help school districts offer salaries that are competitive for the local labor market. For FY 2021, the WAF ranges from 0.796 to 1.108. However, the foundation budget formula sets a WAF floor of 1, meaning the state does not adjust allotments downward in communities where wages are lower than a factor of 1.⁷ This benefits communities in labor market areas with lower wages.

Table 4 shows that applying a floor of 1 to the WAF accounts for \$158 million in Chapter 70 aid in the FY 2021 H.2, or \$169 per

student, that otherwise would not go out to communities in lower wage labor market areas. Almost all of this aid currently goes to low-wealth communities, making the floor highly progressive in terms of its impact on Chapter 70 aid distribution among school districts.

Table 4: Chapter 70 Aid Attributable to the Wage Adjustment Factor Floor (FY 2021 H.2)

	AGGREGATE	PER PUPIL	DISTRICTS BENEFITING
LEAST WEALTHY			
Quintile 1	\$159,529,701	\$519	40
Quintile 2	\$1,557,744	\$12	22
Quintile 3	(\$6,095,874)	(\$41)	4
Quintile 4	\$2,744,539	\$17	9
WEALTHIEST			
Quintile 5	\$359,863	\$2	11

Source: Authors' calculations.

Note: Aid attributable to the WAF floor is negative for Quintile 3. This can be interpreted as forgone state aid that is not delivered as a result of the WAF floor. The removal of the WAF floor yields a net aid increase across Quintile 3 districts. It is important to note that this impact is not uniform across districts, as indicated by the fact that, despite the net negative aid in Quintile 3, four districts nonetheless benefit from additional state aid attributable to the WAF floor.

We also examined what would happen if the WAF were removed entirely, effectively leaving foundation budget allotments unadjusted in high-wage labor markets across the state. Increasing base foundation budget rates by the WAF in higher wage areas accounts for \$46 million, or \$49 per student, in Chapter 70 aid. Table 5 shows that the impact is somewhat greater in lower wealth districts. On a per-student basis, the impact is greatest (though still relatively small) in low- and middle-wealth communities.

⁷ In the foundation budget formula, the WAF is multiplied by the base allotment for the following 8 (out of 11) foundation budget categories: administration; instructional leadership; classroom and specialist teachers; other teaching services; professional development; guidance and psychological services; pupil services; and operations and maintenance. A WAF of 1 makes no changes to the base allotments. A WAF above 1 increases the base foundation allotments by a percentage equal to the WAF minus 1. For example, foundation allotments in the categories above for Cambridge, which has a WAF 1.108, are 10.8% larger as a result of the WAF.

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Table 5: Chapter 70 Aid Attributable to the Wage Adjustment Factor (FY 2021 H.2)

		AGGREGATE	PER PUPIL	DISTRICTS BENEFITING
LEAST WEALTHY WEALTHIEST	Quintile 1	\$15,868,062	\$52	16
	Quintile 2	\$10,964,900	\$85	14
	Quintile 3	\$7,102,417	\$48	8
	Quintile 4	\$9,004,327	\$56	17
	Quintile 5	\$3,385,568	\$18	14

Source: Authors' calculations.

Maximum Local Contribution Share of the Foundation Budget

The required local contribution by a municipality cannot exceed 82.5% of its foundation budget, regardless of that municipality's assessed capacity to spend local resources on education. As a result, the state reduces 157, or 45%, of the Commonwealth's 351 municipalities' required local contributions to 82.5% of their foundation budget. Of these 157 municipalities, 104 can fully meet their foundation budget obligations from local revenue; the other 53 can fund between 82.5% and 100% of their foundation budget from local revenue, according to the state's calculation.

The effect of capping local contributions at 82.5% of each municipality's foundation budget is to distribute Chapter 70 aid more evenly among school districts. This results in additional aid (and lower local contributions) in wealthy communities, and reduces aid and increases the amount of local contributions required in less wealthy communities.

Removing the cap on required local contributions produces a highly progressive but also somewhat counterintuitive effect, as shown in Table 6. It reduces Chapter 70 aid to Quintile 5

districts, all of which have 100% or greater capacity to meet their foundation budget, by only \$4 million, and increases Chapter 70 aid to Quintile 1 and 2 districts by a combined \$149 million. Including increases to Quintile 3 and 4 districts, total Chapter 70 aid increases by almost \$221 million. This occurs because total state contributions are fixed at 59% of the state foundation budget in statute. Raising the maximum local contribution share requires larger contributions from wealthier communities, and, as a result, smaller local contributions are required of communities in the lower quintiles. Those communities now require higher amounts of state aid to maintain foundation budget spending.

Table 6: Chapter 70 Aid Attributable to the Maximum Local Contribution Share of Foundation Budget (FY 2021 H.2)

		AGGREGATE	PER PUPIL	DISTRICTS BENEFITING
LEAST WEALTHY WEALTHIEST	Quintile 1	(\$82,301,777)	(\$268)	0
	Quintile 2	(\$66,781,062)	(\$517)	0
	Quintile 3	(\$65,247,444)	(\$437)	0
	Quintile 4	(\$10,317,970)	(\$64)	13
	Quintile 5	\$3,845,476	\$20	24

Source: Authors' calculations.

Note: Aid attributable to the maximum local contribution share of foundation budget floor is negative for Quintiles 1 through 4. This represents forgone state aid that is not delivered as a result of the use of a cap on local contributions. The impact of this formula factor is large: Quintile 1 through 4 districts collectively forgo \$225 million in state aid. The "Districts Benefiting" column is the number of districts that receive additional aid as a result of the inclusion of the maximum local contribution share of foundation budget formula factor under H.2, and thus would see aid decrease if the formula factor were removed.

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Policy Recommendations

Many needs-blind factors in the Chapter 70 aid formula increase state aid to communities beyond their calculated level of need. These factors disproportionately benefit the wealthiest communities in the Commonwealth. As the Legislature plans the implementation of the SOA with significantly less revenue available, due to the COVID-19 pandemic and associated economic slowdown, needs-blind formula elements deserve careful scrutiny.⁸ And although legislators recently level-funded Chapter 70 state aid (plus inflation) for FY 2021, Massachusetts' deteriorating fiscal climate jeopardizes the state's ability to fully fund the SOA recommendations for years to come. The findings above provide options for altering spending levels far more progressively than delaying implementation of the new SOA foundation rates.

Massachusetts is at a critical juncture in education funding reforms. The Commonwealth must commit to ensuring that all students can access a high-quality education. It is not required that a significant portion of new or existing state funds subsidize communities with the means to provide more funding on their own. Quintile 5 school districts' collective spending was 153% of the amount needed to meet legally required spending obligations in 2019, the last year for which spending data are available.⁹ This level of spending is evidence of significant fiscal capacity beyond what is necessary to meet foundation budget spending requirements. Needs-blind Chapter 70 aid

sent to the state's wealthiest communities is better directed toward low-income students and communities, to help close the decades-long achievement and opportunity gaps the FBRC recommended addressing with additional funding. The impact of needs-blind factors compound over time, making it more expensive for the state to meet the needs of students in low-income communities.¹⁰ It is prudent to address these inequities now, both to ensure the maximum possible funding for high-needs students in light of the fiscal crisis and to better align the state's total investment in K-12 education with student need as the state budget starts to recover.

Based on the findings presented above, the authors have four recommendations to make the Chapter 70 aid distribution formula more equitable. These suggestions can be addressed now, in conjunction with revisions to the foundation budget formula made under the SOA.

1. **Incrementally phase out the hold-harmless provision** that currently guarantees every school district level Chapter 70 aid each fiscal year, even when student enrollment is declining. Chapter 70 aid attributable to the hold-harmless provision is equal to \$319 million in H.2, with the wealthiest school districts receiving approximately 5 times more state aid attributable to the hold-harmless provision per student than the least wealthy districts.

8 Part of this scrutiny entails balancing the statewide and local budget impacts of any formula changes. Although this analysis primarily focuses on the statewide impact of needs-blind formula factors on Chapter 70 aid, budget writers must also consider local factors, such as the student population served by the district. For example, Boston, Cambridge, and Somerville are high-wealth communities (Quintile 5) but have student populations with higher levels of needs, on average, than those of other Quintile 5 districts. Formula changes should not negatively impact higher needs students' access to needed services.

9 By comparison, spending was 104% of required levels in Quintile 1 districts, 124% of required levels in Quintile 2 districts, 128% of required levels in Quintile 3 districts, and 139% of required levels in Quintile 4 districts in 2019. That wealthy communities elect to significantly exceed required spending levels even while in receipt of significant needs-blind aid provides suggestive evidence that wealthy communities' fiscal capacity to spend on schools may be greater than the Chapter 70 aid formula estimates. The SOA requires that the Division of Local Services within the Department of Revenue and the Department of Elementary and Secondary Education jointly conduct a study on the equity, predictability, and accuracy of how the formula determines municipalities' ability to contribute toward education funding.

10 An econometric study of the Chapter 70 formula published in 2011 found the following: "Once a district receives aid in excess of foundation, it faces an increased likelihood that it will be eligible for such aid in subsequent years as well" (Fahy, 2011, p. 226). According to the author's calculations, 214 of the 247 districts that received aid above foundation in FY 2008 (87%) also received aid above foundation in FY 2009. Of those districts, almost half would not have been eligible for aid above foundation in FY 2009 had those districts not received it in previous year. In other words, aid obligations created in previous years rolled over, obliging the state to send aid above foundation even though those districts' FY 2009 situations did not call for this additional aid. Although subsequent changes have been made to the foundation and Chapter 70 distribution formulas, two core non-needs-based mechanisms examined in Fahy (2011)—minimum aid and the hold-harmless provision—remain in place. Our own analysis of last year's (FY 2020) Chapter 70 aid indicated that a total of \$700 million in needs-blind aid was delivered to school districts. The \$778 million in needs-blind aid in the proposed FY 2021 H.2 Chapter 70 budget represents a \$78 million increase in needs-blind aid over the previous year.

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The phase-out should be implemented incrementally. Some districts—particularly those with persistently declining enrollment, many of which are not wealthy—benefit from the hold-harmless provision. As a result, each year, these districts' annual Chapter 70 aid amount exceeds the target amount calculated in the state aid formula by a large margin. In some districts, often those that serve smaller or rural middle-wealth communities, Chapter 70 aid as a percentage of the district foundation budget is more than double the target aid percentage. Removing the hold-harmless provision would cause significant reductions in aid to these communities.

Even a phased withdrawal of the hold-harmless provision would cause significant budget pressures in the beneficiary school districts and the municipalities that support them. Should initiating a phased withdrawal of the hold-harmless provision not be immediately feasible, an alternative step is to switch to a per-student hold-harmless calculation, such that districts are guaranteed a certain amount per student relative to a base year, but are not guaranteed an ever-increasing budget in the face of declining enrollment or other factors that reduce the need for Chapter 70 aid. Holding districts harmless to their FY 2020 per-pupil Chapter 70 aid amounts frees up \$16 million that could be redistributed on the basis of student need to districts.

2. **Phase out minimum aid.** Minimum aid in the proposed FY 2021 budget accounts for \$11.9 million in Chapter 70 aid, with the wealthiest school districts receiving more than 6 times more minimum aid per student compared with the lowest resourced districts. The SOA also introduced a new form of minimum aid, called the minimum aid adjustment, which benefits school districts for which the SOA reforms result in a reduction in Chapter 70 aid. This adjustment requires the state to calculate annually the amount of Chapter 70 aid that each district would have received, using the foundation budget rates that the SOA replaced, and provide aid in the amount dictated by the old rates if, after adjusting for inflation, the old rates yield a greater amount of Chapter 70 aid. This form of minimum aid should also be removed.
3. **Eliminate below-effort aid to municipalities that have the capacity to fund 125% or more of their foundation budget from local contributions.** Below-effort aid helps municipalities facing a large annual increase in required contributions to their schools to afford the increased contribution. Providing below-effort aid effectively shifts some of the

responsibility for paying for the increased required contribution from the municipality to the state. Municipalities with the capacity to fund 125% or more of their foundation from local revenue do not necessarily need additional state support to afford their required local contribution.

Currently, the state does not provide below-effort aid to districts that have local contribution capacity in excess of 175% of their entire foundation budget. Eliminating below-effort aid to municipalities that have the capacity to fund 125% or more of their foundation budget is, therefore, an extension of the state's current approach. Lowering the threshold at which communities are expected to meet their target from 175% of their foundation budget to 125% of foundation budget would affect 11 districts and changes state aid by \$1 million under the FY 2021 H.2 budget proposal. The impact on the bottom 80% of districts in terms of wealth is minimal, increasing the overall progressivity of Chapter 70 aid.

4. **Increase from 82.5% to 85% the maximum required local contribution share of the foundation budget that wealthy communities are expected to make,** and examine the impact on equity of further increasing the maximum required contributions through the study of municipal contributions, which is required under the SOA. Raising the maximum local contribution share to 85% of the foundation budget reduces Chapter 70 aid in wealthier Quintile 4 and 5 districts by approximately \$5.4 million and increases Chapter 70 aid in Quintile 1, 2, and 3 districts by \$11.8 million. The result is a net increase in Chapter 70 aid of \$6.4 million, meaning that raising the maximum required local contribution increases both the progressivity and total amount of Chapter 70 aid.

Together, these four changes reduce Chapter 70 aid by a total of \$25.2 million, 0.5% of total Chapter 70 aid and 8% of the Chapter 70 increase in H.2. These changes are progressive, generating an increase in Chapter 70 aid of \$2.5 million in the lowest wealth Quintile 1 districts and reducing aid by \$13.2 million in the highest wealth Quintile 5 districts.

The recommendations above are meant to illustrate how reforms to the formula factors examined in this paper can improve the progressivity of aid by both increasing aid to lower wealth communities and reducing needs-blind aid to wealthy communities. The overall impact on the amount of aid to any community is relatively small, demonstrating how progress

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toward a more needs-based distribution of aid could be made without forcing significant single-year adjustments in any community. Should a larger impact be required, greater progress toward phasing out the hold-harmless provision and further lowering the threshold at which districts no longer benefit from below-effort aid would both further reduce Chapter 70 aid and slightly increase the progressivity of its distribution. Further increasing the maximum required contribution share of the foundation budget for wealthy communities increases the amount of Chapter 70 aid and slightly increases the progressivity of its distribution.

The state budgets in upcoming fiscal years will undoubtedly be among the most strained in the state's history, with budget writers stuck in the vise grip of enormous reductions in revenue and greater demand for public services. Making the best use of the state's resources is an urgent necessity not only

because of budget stress, but even more so because of the collective and imperative responsibility to close achievement and opportunity gaps. Changes to the needs-blind formula factors examined in this report should be considered as options in the FY 2021 budget process, especially at a moment when there is a well-established disparity between the state aid provided to the lowest income communities and what they need. Even in the absence of a budget crisis, the significant amount of aid distributed each year as a result of needs-blind factors is cause for further examination. The SOA, passed before the current crisis, requires studying the equity of how the formula currently determines municipal capacity to contribute to schools. In addition to the recommendations above, such a study is an important step in determining whether Massachusetts continues to miss the mark on fulfilling the SOA's historic commitment to progressive education funding reform.

Appendix 1: Glossary

Base aid: Equal to the amount of Chapter 70 state aid provided to a school district in the prior fiscal year. Base aid ensures that every school district gets at least as much Chapter 70 state aid as it did the previous year. Other forms of aid, such as minimum aid and below-effort aid, as well as any required foundation aid increase, are added on top of base aid.

Below-effort aid: State aid provided when a municipality's required contribution falls below its target contribution, and the funding available to at least one of the school districts to which the municipality belongs would fall short of the districts' foundation budgets as a result. Below-effort aid is a subset of overall foundation aid.

Chapter 70 state education aid: Total state aid distributed to school districts to supplement local revenue allocated to schools and allow them to provide an adequate education to all students, as required under Chapter 70 of the Massachusetts General Laws. Chapter 70 aid fills the difference between the revenue a school district can afford to raise from local sources and the total amount of money needed to adequately meet the needs of all students. It is defined in statute as the greater of (a) foundation aid or (b) the sum of base aid and minimum aid.

Chapter 70 state education aid formula: The formula that determines how responsibility for the total required spending, determined by the foundation budget formula, is shared among the state and each of its public school districts. The formula calculation starts with each municipality's foundation budget and determines what each municipality can afford to contribute based on its property wealth and residents' income. The formula then adjusts this amount using factors such as base aid, minimum aid, below-effort aid, and others to arrive at a final required local contribution for each municipality and state Chapter 70 aid contribution to each district.

Foundation aid: For each school district, the difference between the foundation budget of that district and the required local contribution of the municipality(ies) it serves.

Foundation budget formula: The state formula that determines how much money is needed to provide every student enrolled in public school districts an adequate education. It starts with the number of students enrolled in a district and allocates a

fixed amount of money per student, a foundation allotment rate, for each of the following foundation categories: administration; instructional leadership; classroom and specialist teachers; other teaching services; professional development; instructional materials, equipment and technology; guidance and psychological services; pupil services; operations and maintenance; employee benefits and fixed charges; and special education tuition. It then adds additional money, or increments, to the total of each student's base rates if the student is designated as a special education, English learner, or low-income pupil. The result of this calculation is the total amount that must be spent at the state, municipal, and district levels on K-12 education.

Hold harmless: A commitment on the part of the Legislature that no school district should receive less Chapter 70 aid than that of the prior year, regardless of changes in the number and needs of students served. Base aid is the factor in the Chapter 70 aid formula that guarantees that every district is held harmless.

Minimum aid: The amount of Chapter 70 state aid provided in addition to base aid to school districts so that each district is ensured a per-student increase above the prior year's aid amount. The minimum per-student amount is determined by the Legislature each year, and under the SOA would not be allowed to fall below \$30 per student. Minimum aid is distributed only when foundation aid is insufficient to generate the minimum per-student Chapter 70 increase required by the Legislature. For example, if base aid plus foundation aid generates a \$20 per-student Chapter 70 increase, the school district would receive \$10 per student in minimum aid so that it receives the minimum required per-student increase.

Municipal revenue growth factor (MRGF): A multiplier that quantifies for each municipality its capacity to increase the amount of its local contribution to the foundation budget of the school district(s) its students attend as a result of (a) growth in municipal revenue due to Proposition 2½ levy limit increases and (b) additional revenue resulting from new growth in the tax base, as compared to the prior year. The Division of Local Services of the Massachusetts Department of Revenue calculates the MRGF.

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Preliminary local contribution: A municipality's required local contribution for the prior fiscal year increased by the municipal revenue growth factor. The preliminary local contribution is one of the figures used in the Chapter 70 aid formula for determining a municipality's required local contribution.

Required local contribution: The total amount a school district is required to contribute toward its foundation budget. The required local contribution is calculated by adjusting the target local contribution by Chapter 70 aid formula factors such as below-effort aid and the 82.5% cap on required local contributions.

Target local contribution: The amount a municipality can contribute to the foundation budget of the school district(s) its students attend, based on its property wealth and residents' income, provided that the Legislature has determined that no

municipality's target local contribution can exceed 82.5% of its foundation budget. The target local contribution is one of the figures used in the Chapter 70 aid formula for determining a municipality's required local contribution.

Wage adjustment factor (WAF): A multiplier used in the foundation budget formula to account for differences in average wage level in different labor market areas in the Commonwealth. It reflects the view that, depending on where a school district is located, the school district may need to adjust staff wages relative to the state average in order to offer competitive salaries and wages. The WAF is calculated by the Department of Elementary and Secondary Education using average wage data supplied by the Massachusetts Executive Office of Labor and Workforce Development.

Appendix 2: Methodology

This analysis is based on the Complete Formula Spreadsheet published by the Department of Elementary and Secondary Education (DESE) on January 22, 2020, and available on its website. The version of the spreadsheet used reflects the governor's preliminary FY 2021 H.2 budget proposal. This spreadsheet takes as inputs the foundation budget for each district (calculated and divided among the district's member municipalities by DESE in a separate set of spreadsheets) as well as parameters such as the minimum aid per student, base aid, and the cap on required local contributions as a percentage of the foundation budget, and calculates a required local contribution and the amount of state aid for each school district. Some of the formula factors studied are not possible to modify in the version of the file provided by DESE on its website; therefore, the formulas in this file were augmented by the research team to allow analysis of the impact of a broader set of needs-blind factors. Specifically, parameters that allow analysis of changes to the WAF and below-effort aid were added by the research team, as were parameters that allow reductions in minimum and base aid to be conditioned on community wealth and income.

The SOA contains a minimum aid adjustment provision that provides additional hold-harmless aid to districts that would have lost aid due to SOA changes to the formula. This provision was removed by the research team before conducting the analysis. Not removing it would have made it impossible to capture the impact of any formula factors whose removal would have resulted in a district receiving less aid than it had in FY 2020. Removing the Minimum Aid Adjustment did not affect the total foundation budget or communities' required local contributions, and reduced Chapter 70 aid by under \$1 million, so the difference between the preliminary FY 2021 aid published in H.2 and the amounts used in the calculations described above are negligible.

The impact of each needs-blind formula factor was determined by rerunning the required local contribution and aid calculations with that factor removed from the formula and subtracting the results from the official FY 2021 amounts published by DESE (less the Minimum Aid Adjustment). The total impact of needs-blind formula factors was determined by running the required local contribution and aid calculations with all factors removed.

Quintiles of district wealth were calculated by the research team by ranking each school district by the ratio of its combined effort yield to its foundation budget. The combined effort yield is the sum of a district's property and income effort. It is calculated by DESE to determine how much each municipality must contribute to funding its schools based on its property wealth and income such that the sum of effort from every district equals 59% of the total statewide foundation budget, as required under statute. The combined effort yield serves as a measure of relative effort capacity among districts based on both income and wealth. A higher combined effort yield indicates that a district has a greater capacity to fund its schools. Nonoperational districts were excluded from this ranking, leaving a total of 318 operational school districts that were then divided into quintiles of 63 or 64 districts each.

We examine the impact on resource equity of needs-blind formula factors by school district because school districts are the entities that receive Chapter 70 aid under the formula. One could equally ask about the impact of needs-blind funding formula factors on student subgroups, regardless of which district students in the subgroup attend. Those interested in this question should refer to Lee and Blagg (2018). For an econometric examination of the impact of formula factors that cause a deviation from the distribution of a "pure" implementation of the foundation budget formula, see Fahy (2011).

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