

Technical Supplement



Gap Analysis Comparing Maryland to
International and Domestic Top Performers

January 2018

This report was produced by the Center on International Education Benchmarking® of the National Center on Education and the Economy®.

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This work may be cited as:

CIEB, “How Does Maryland Stack Up: Gap Analysis Comparing Maryland to International and Domestic Top Performers” (Washington, DC: National Center on Education and the Economy, 2018).

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BUILDING BLOCK 1:



PROVIDE STRONG SUPPORTS FOR CHILDREN
AND THEIR FAMILIES BEFORE STUDENTS ARRIVE AT SCHOOL

The Benchmark

To ensure readiness at school, top-performing jurisdictions provide strong supports for children and their families before children arrive at school. They do this by:

- ***Providing support services to children ages 0-3 and their families:*** This includes maternal and child health services; parent education; paid parental leave; family allowances; and other financial supports. These services are typically made available universally, with extra resources focused on disadvantaged families.
- ***Providing high-quality childcare and early childhood education for all children ages 0-5:*** These systems focus on ensuring that care and education for young children is accessible, affordable and of high quality.

Historically, the aim of policies to support families with children was to raise the birthrate in some of these jurisdictions — following WWII in Finland and after the establishment of the nation in Singapore in the 1960s for example—but over time the need to support increasing numbers of women entering the workforce, addressing the broader need to educate all children to high skill levels, and specifically addressing inequities in opportunities for disadvantaged children and diversifying populations has provided the rationale for strengthening and expanding these supports across all of the jurisdictions.

International Top Performers

Support Services for Children 0-3 and Their Families

The international jurisdictions offer more extensive supports for young

children and their families, particularly for low-income families, than in the United States. These supports are commonly offered universally, with extra levels of support for low-income and disadvantaged families. Supports include health and wellness services, parent education, connection to social services, paid leave to ensure parents can bond with their newborns and even cash payments to support families with young children.

Healthcare, including maternal and child health services, is universally provided. In Finland, there is a public health service that serves all Finns. There is a national system of maternal health clinics that provide prenatal services to new mothers, including home visits after birth to ensure that both mothers and new babies are well and are connected to health services. Child health clinics serve all children 0-6, and focus on health monitoring and screening for young children. Children are transitioned to school health clinics after reaching school age.

In Ontario, all families qualify for the publically funded Ontario Health Insurance Plan and have access to medical care, including maternal health services. Pregnant women have regular prenatal care and all screenings are covered. The province funds special initiatives to ensure that families in low-income neighborhoods are connected to health services and that young children are screened early for any health or developmental delays, including home visits by nurses after babies are born for all new immigrants and other families with disadvantages or for families with a child under age 3 with developmental delays. Ontario has networks of family literacy and early years centers for all families, some based in public schools and some in the community to educate parents and young children. The

province is planning to consolidate this range of services into a single system of centers to better coordinate services and make them more transparent to all families beginning in 2018. Singapore provides publically funded health insurance for major medical costs and then relies on health savings plans (Medi-Save) for families to fund their own additional health care costs. These individual savings plans are subsidized for low-income families. There are additional national programs that provide funds for uncovered health costs for all Singaporeans (Medi-fund) and for children under age 18 (Medi-fund Junior). Singapore provides additional funding for maternity care, including a “starter” Medi-Save account for every newborn. Singapore funds a range of initiatives to “reach-out” to and often visit low-income families with young children to ensure that they are connected to services and early childhood education.

Even Shanghai, where the health care system is not as developed as in the other international jurisdictions, has made provision of care for all families with young children, and for new mothers in particular, a priority. It is currently estimated that over 95 percent of the population is covered by health insurance, but this number does not include migrant workers, which make up about 40 percent of the population. Taking this into account, coverage is probably closer to 60 percent of the full population. The province, though, has pledged to provide universal health care coverage by 2020, including to the migrant population and it is making progress on this, with special programs to first cover all migrant children. The province has organized a network of maternal and child health clinics in each district, and every pregnant woman is required to “register” for pre-natal

health services. All hospitals are required to organize visits to new mothers in their home after birth and ensure that newborns are under the care of a child health clinic.

In addition to health services, these jurisdictions have made allowing new mothers, and increasingly fathers, to stay home to care for newborns financially possible. Finland and Ontario provide paid leave for parents that extends to one year or more. In Finland, this is paid at 100 percent of salary for working parents. In Ontario, most families receive 55 percent of their salary, but low-income families receive 80 percent. Both jurisdictions offer about 4 months of paid leave for new mothers, followed by another 8 months of leave for one parent or the other in Ontario and 10 months more in Finland. In Finland, parents who choose to take care of their children at home after age one are entitled to a “day care allowance”, similar to what is available to families paying for care outside of the home. In Shanghai and Singapore, leave is primarily for new mothers. It covers approximately 5 months of leave in Shanghai and 4 months in Singapore. Both jurisdictions have added longer paternity leaves as well, two weeks in both jurisdictions.

Paid leave is not the only financial support provided. In Finland, Singapore and Ontario, financial supports are provided directly to families with children. In Finland, there is a monthly “family allowance” paid per child to all parents until children are age 17. The amount increases for each additional child, and there is a supplement for single parents. Singapore pays a “baby bonus”: a one-time payment of about US\$5,750 for each child (with higher payments for children beyond the first two). It also provides a Child Development Account for each newborn

with an initial contribution of US\$2,151 and matching contributions thereafter. CDAs fund childcare, enrichment activities or other educational costs. Canada pays a Child Benefit to all families with low to middle incomes. Families receive up to US\$533 monthly

for each child under age 6. The benefit is paid at a sliding scale to families with incomes up to about US\$140,000. Ontario adds an additional benefit to the national one, for low-income families.

Chart 1: International Top Performers: Supports for Families with Children 0-3

	Total Paid Leave for Parents	Financial Benefits for Young Children	Maternal and Childcare
Finland	26 months	Monthly allowance (US\$103) for each child through age 17; supplements for single parents (US\$53)	Free health care Network of maternal and child health clinic to serve all Finns Home visits for all new mothers
Ontario	12 months	Canada Child Benefit: Paid on a sliding scale for families with income under US\$140,000. Up to US\$533/month each child under age 6 and US\$392/month for each child from 6-17 Ontario Child Benefit: US\$996 per child annually for families with income below US\$22,042	Free health care Screenings for all young children Home visiting targeted on disadvantaged families and those with special needs children
Shanghai	5.5 months		Publically funded health insurance (goal of universal insurance by 2020) Maternal health clinics in each district and all new mothers register for pre- and post-natal care Home visits for all new mothers
Singapore	4.5 months	One-time baby bonus for each child (US\$5737 for the first two children; US\$7,172 for each additional) Child Development Account (CDA) for educational enrichment with US\$2141 per child at birth and up to US\$2141 per year in matching contributions each year thereafter.	Publically funded health insurance for major medical expenses; savings plans for other health costs, which are subsidized for low-income families Maternal health care subsidized for all low-income families Home visits as part of specific initiatives for disadvantaged families

High Quality Childcare

The international jurisdictions have much more extensive public support for childcare services than is typical in the United States. While the four jurisdictions analyzed here are at different levels in regard to meeting the full demand for childcare, they have all made the provision of high quality and accessible childcare a priority.

Childcare is a “right” in Finland, where an extensive system of highly subsidized public childcare is used by most families. These centers are fee-based, but the highest fee is US\$315

monthly and all families earning US\$70,000 or less are subsidized, with those earning less than US\$36,000 sending their children for free. Finland just this year increased the income threshold for these subsidies, in an effort to further increase access for all families. There is a private day care sector in Finland as well, and the national government additionally provides allowances to families who choose these services. Subsidy levels are supplemented for single parents in all cases. As childcare is understood to be a right, there are adequate spaces for families.

Finland recently transferred authority for childcare centers to the Ministry of Education, so that early childhood care is coordinated with pre-primary and primary education. The Ministry put in place new curriculum guidelines for early childhood care and education, in an effort to raise the quality of childcare across the nation. Childcare quality is generally monitored at a municipal level (with national intervention only in response to problems and for the purpose of assessing the whole system to put in place new policies), but the municipalities are required to follow the national guidelines. Staffing

qualifications are high by international standards. Every third staff member in childcare centers is required to have teacher qualifications, which requires a bachelor’s degree. Other staff have post-secondary early childhood education diplomas.

Ontario provides subsidies for childcare, for families in addition to the Canada and the Ontario Family Benefits. The provincial subsidies are targeted to families earning less than US\$30,000. Childcare costs are high in the province so these subsidies are critical to ensure accessibility. Availability of spaces is an issue but the government is tackling the issue aggressively, committing to expand licensed childcare slots for 0-4 year-olds by 100,000 by 2022. In 2016, it was estimated that there were only licensed childcare slots for 20 percent of the children under age 4 in the province.¹ The province is moving ahead on this issue aggressively: in 2016-2017 for example, they added 24,000 slots. Ontario is also committed to raising the quality of childcare across the system. Its 2014 overhaul of the province’s childcare law now requires all licensed centers to adhere to the Ministry of Education’s framework for early learning, and has raised qualification requirements for staff. The Ministry provides tuition benefits as an incentive for all existing staff (from both licensed and unlicensed centers) to acquire a diploma in early childhood education.

Singapore has made major investments in its childcare system over the last decade. Before then, the private sector dominated and served a relatively low proportion of families. Increasing numbers of women in the workforce made it an economic imperative to expand the sector. The Singapore government established a still-expanding set of public options for childcare and early education and put in

place new curriculum and quality standards to raise the quality of the whole sector, both public and private. A major effort has also been made to upgrade staffing, with the creation of new credentials for childcare workers and free tuition for the current workforce to upgrade to the new credentials. Singapore also developed a career ladder for early childhood educators, with several levels of teacher positions and a leadership track, with a higher-level credential and pay for each step on the ladder. In 2017, Singapore unveiled new professional development programs that align with the career ladder.

Singapore coupled development of these programs with a number of initiatives to enable all families to take up these services. Singapore provides universal childcare subsidies to all families, with multiple tiers of financial support that include middle and lower income families. Singapore also operates an “anchor” network of private providers who receive government supports if they agree to keep fees low for families. The government has also been proactive in recruiting low-income families into childcare and early childhood education programs, funding home visits and connecting these families to programs in their neighborhoods.

Shanghai is behind the other international jurisdictions in the provision of childcare for 0-3-year-olds.

Despite a robust public preschool system for 3-6-year-olds (called kindergartens) with very high enrollment, Shanghai has been slow in supporting the development of a childcare system for the youngest children. Traditionally grandparents have taken on the burden of care for young children when parents work. A private childcare sector is expanding rapidly however, and the best recent estimates of enrollment are about 20 percent of 2-year-olds. There is a high level of public attention to this issue, and Shanghai has significantly raised investments in the expansion of the sector, with new subsidies to employers to build childcare facilities for workers and construction of facilities in residential areas. Some of the public kindergartens have developed classes for 2-year-olds. Subsidies for childcare are available for low-income families.

In the international jurisdictions, pay for childcare workers is moderately high, at 71, 80 and 60 percent of the average jurisdiction wage in Finland, Ontario and Singapore. Center directors earn about the same as the average wage in each jurisdiction, with the exception of Singapore. Singapore’s wages for childcare directors are 77 percent higher than the average wage in the country. This wage level reflects Singapore’s career ladder for early childhood education and care, with a progression of roles with increasing responsibilities and pay for early childhood educators.

Chart 2: International Top Performers: High Quality Childcare

	Percent of children in childcare (public and private)	Average full cost of monthly center care	Subsidies for childcare	Average childcare worker salary / percent of jurisdiction average salary
Finland	52	US\$315 (set fee without subsidy)	Free for families earning less than US\$36,000; income based subsidies for families with income up to about US\$71,000	US\$28,906 / 71 percent
Ontario	15 (0-1-year-olds)	US\$1275 (infant)	Ontario Childcare Subsidy for families with income under US\$29,391 to cover 75-100 percent of cost	US\$28,664 / 80 percent
	62 (2-4-year-olds)	US\$974 (toddler)		
Shanghai	20 (2-3-year-olds)	n.d.	Subsidies for low-income families	n.d.
Singapore	16 (0-2-year-olds)	US\$1056 (infant)	Universal subsidy: US\$430/month for infant and US\$215/month for toddler care	US\$15,450- US\$18,024 / 51-60 percent
	63 (3-year-olds)	US\$725 (toddler)	Families with income below US\$64,368 receive additional US\$315 toddler and US\$386 for infants	

High-Quality Early Childhood Education

The international jurisdictions all provide free or very low cost public preschool for 3-6-year-olds. There is a private sector in each jurisdiction but in all but Singapore, the majority of students attend public preschools. In three of the four jurisdictions, these programs are overseen by the national education ministry or by the provincial/municipal governing body, ensuring coordination with the primary school system. In Singapore, for example, a new agency, the Education and Care Development Agency, was created in 2013 to oversee all early childhood education programs for pre-primary school children.

In Finland, children attend preschool primarily in community centers, although they are increasingly based at

the public school. Finland only made pre-primary school compulsory for 6-year-olds in 2015, so many 6-year-old programs are still located in the community. Programs are operated by the Ministry of Education and adhere to the Ministry's curriculum for young children. Lead teachers (at least every third staff member) have bachelor's degrees, but other staff need only diplomas in early childhood education from polytechnic institutions. Teachers for pre-primary school for six-year-olds all have bachelor's degrees and teaching certifications.

In Ontario, full day kindergarten is free for 4- and 5-year-olds. Almost all 5-year-olds are enrolled and enrollment of 4-year-olds is about 50 percent of the cohort but growing quickly, as full-day kindergarten for 4-year-olds was fully implemented in 2016-2017. Teachers

need full teaching certifications, requiring a bachelor's degree.

Shanghai has a system of public preschools (called kindergartens) for 3-6-year-olds, and there is also a group of private providers. The province has quality standards for all programs, and rates them each year according to the standards. There is also a municipality-wide curriculum that all programs follow. Fees are based on government ratings. Private programs charge families much more, but are also rated by and required to follow the province curriculum.

Singapore developed a system of public preschools (also called kindergartens) a decade ago. Before that, the sector was entirely private. There are now three types of kindergartens in Singapore: those operated by the Ministry of Education (MOE), those funded by the Ministry but operated by private providers in the community called "anchor operators", and fully private providers. The kindergartens are fee-based, but fees are low or highly subsidized. The "anchor" operators that receive government subsidies must agree to keep their fees low. The highest

fees in the MOE and anchor kindergartens are US\$114/month. Singapore has made a significant investment in raising the skill level of staff, providing tuition grants for aspiring kindergarten teachers and creating a leadership track within early childhood education. Singapore also created a kindergarten curriculum and program standards, which are required for both public and private kindergartens.

Only Ontario among the international jurisdictions uses an assessment for school readiness and it does this on a sample basis every three years. It is used to inform provincial policy rather than to track individual student readiness. Shanghai's provincial curriculum for its preschool programs specifies a "readiness" for school section as children are getting ready to transition to school, but does not specify a specific assessment. All of the jurisdictions rely on teachers to monitor readiness throughout the program and also screen students when they arrive at primary school to determine which students need extra assistance.

Chart 3: International Top Performers: High Quality Preschool/Pre-K

Percent preschool enrollment		Preschool costs (public)	Average preschool teacher salary/percent of jurisdiction average salary
Finland	74 (4-year-olds) 79 (5-year-olds)	Free public preschool for 6-year-olds and 4-5-year-olds in families with income below \$36,000; subsidies for families with income up to US\$71,000; US\$315 for other families	\$34,673/85 percent
Ontario	48 (4-year-olds) 92 (5-year-olds)	Free full day kindergarten for 4-5-year-olds	US\$30,841-US\$40,020/86-112 percent
Shanghai	98 (4-5-year-olds)	US\$72-US\$160/month depending on grade Fees waived for low-income families	n.d.
Singapore	90 (4-year-olds) 92 (5-year-olds)	US\$114/month Fee assistance for families with incomes up to US\$51,000	US\$18,881-\$25,747/63-85 percent

Top-Performing States

Support Services for Children 0-3 and Their Families

While health care is free for all citizens in Finland and Ontario, major medical expenses (supplemented by health saving accounts for all citizens) are covered in Singapore, and an increasing percent of the population is covered in Shanghai with a goal of full coverage by 2020, health coverage in the United States is more limited. The United States provides free health care only to low-income families and children in families with incomes of up to 300 percent of the federal poverty level. This was \$60,480 for a family of four in 2016. The only other group that is covered are those over age 65. Other Americans pay for health care or health insurance out of pocket or have health insurance provided by their employers. The largest federal program, Medicaid, provides health insurance to low-income people, including children, the elderly, pregnant women, parents and caregivers. A supplemental program to Medicaid, the Children's Health Insurance Program (CHIP), targets uninsured children up to 19 who have incomes higher than the Medicaid eligibility rate, up to 200-300 percent of the federal poverty level. CHIP also provides some coverage to parents and caregivers but the income eligibility is typically much lower. States are responsible for administering the program, but receive federal funding to supplement their own funding. Each state sets its own eligibility rules within the federal guidelines, chooses whether to offer CHIP, and sets income guidelines for CHIP as well. Taking CHIP together with Medicaid the benchmark states have generally similar income cut-offs for public health insurance. Children are eligible for coverage if they are in families of four

making up to \$73,800 in Massachusetts, \$78,228 in New Hampshire, and \$86,100 in New Jersey.

The Affordable Care Act includes a program to support post-natal home visits for families in high-risk communities in all 50 states, the Maternal, Infant, and Early Childhood Home Visiting Program (MIECHVP). The funding requires states to use home visiting models from an approved list. The states have significantly increased home visits with this funding. Early Head Start also provides funding for home visits.

The three states all offer home visiting programs, funded by the federal MIECHVP. Massachusetts and New Jersey use several of the federally approved models and their home visiting focuses on both maternal and child health and parent education. New Hampshire uses only one model — Healthy Families America — which develops strategies to reach specific target populations such as families at risk for drug or substance abuse.

The three benchmark states have put in place regional centers to coordinate health, education and other support services for children 0-3 and their families, but they vary in coverage and in emphasis. Massachusetts and New Jersey have centers operated by non-profits in each region of the state to coordinate and provide family support services, while New Hampshire coordinates services in its regional Health and Human Services offices. New Hampshire's primary focus in the coordination of services is protection of children from abuse and neglect, rather than connection of all families to services and supports. Massachusetts has Coordinated Family and Community Engagement programs which provide access to a wide range of

services, including health services, social services, parent and infant/toddler education, childcare referrals, in each community, along with Family Resource Centers with a special focus on providing parent and infant/toddler education. New Jersey also has a network of coordinating centers (Family and Community Partnerships) overseen by the Councils of Young Children, community-run boards that operate in each region. All three states have home visiting programs focused on health and parent education, although only New Jersey goes beyond the federal programs and supports several other state home visiting programs including Home Instruction for Preschool Parents and Youngsters (HIPPY) which focuses on parent education and school readiness and Nurse-Parent Partnerships which focused on maternal health services to further extend their reach to high-need families. In all of these states, the services offered are targeted at low-income families, or those with other disadvantages such as immigrant status or children at risk of abuse or neglect. This is different from the international jurisdictions where these services tend to be offered universally and have much greater coverage across the population. The best estimates in U.S. states of the coverage of these programs are less than 10 percent, and often less than 5 percent, of the eligible population.⁴

U.S. states in general serve as a coordinating service for a variety of state and federal programs, as there is often no one state agency responsible for early childhood education and care. Massachusetts is a notable exception in that it was the first state in the nation to bring early childhood services under one roof with the creation of the Department of Early Care and

Education in 2005. New Jersey and New Hampshire both split oversight for early childhood education and care between the health and human services and the education departments. In 2010, the Head Start Act required all states receiving Head Start funds to create governor-appointed state advisory councils on early childhood education and care, charged with coordinating and improving services to young children. All three benchmark states have these councils, and they have created strategic plans for better coordination and quality improvements along with early learning guidelines or standards. New Jersey created a regional governance structure for its state council that oversees services in each county.

Few U.S. states offer paid family leave, as is the policy in the top-performing international jurisdictions. The federal Family and Medical Leave Act (FMLA) requires private employers with 50 or more employees to grant up to 12 weeks of **unpaid** leave per year to employees who have worked at their current employer for at least a year. Leave may be used in order to give birth and raise a newborn, or to care for a child or a family member's medical condition or their own medical condition. Although the leave is unpaid, employers are required to maintain any group medical insurance the employee was enrolled in during the leave.⁵ A few states have expanded the length of time available to employees or offered paid medical leave, funded through payroll taxes and administered via state disability programs. Only four states in the United States (and D.C.) — including benchmark state New Jersey — have laws requiring paid maternity leave for qualifying workers. New Jersey requires 6 weeks of paid maternity leave.

Chart 4: Top-Performing States: Support Services for Children Ages 0-3 and Their Families

Total Paid Leave for Parents		Maternal and Child Health Care	Local/Regional Coordination and Delivery of Services
MA	None	Low-income families with young children covered by Medicaid with incomes up to \$49,200 and children covered by CHIP in families up to \$73,800 Affordable Care Act (ACA)-funded home visit program for high-need families using the Healthy Families America, Parents as Teachers and Healthy Steps models; Early Head Start home visiting	Coordinate Family and Community Engagement partnerships in each community Family Resource Centers in each region of the state
NH	None	Low-income families with young children covered by Medicaid with incomes up to \$78,228 ACA-funded home visit program for high-need families using the Healthy Families America model; Early Head Start home visiting	Regional Department of Health and Human Services office coordinate services in each region
NJ	6 weeks	Low-income families with young children covered by Medicaid with incomes up to \$47,724 and children covered by CHIP in families with incomes up to \$86,100 ACA-funded home visit program for high-need families using the Nurse Parent Partnerships, Healthy Families America and Parents as Teachers models; Early Head Start home visiting	Family and Community Partnerships coordinate services in each region Regional Councils on Young Children oversee these partnerships
MD	None	Low-income families with young children covered by Medicaid, with incomes up to \$77,982 ACA-funded home visit program for high need families using the Nurse Parent Partnerships and Healthy Families America models; Early Head Start home visiting; additional state funded home visiting programs including HIPPY and Parents as Teachers	Family Support Centers in high-need communities offer parent education and services and toddler/infant education programs in addition to service coordination Judy Centers located in Title 1 school neighborhoods to coordinate available services in the community, with goal of school readiness

High Quality Childcare

U.S. states offer subsidies for childcare to two populations: families on public assistance and low-to-middle-income families not on public assistance. Federal law requires states to offer free childcare to families on public assistance and for up to two years after transitioning off assistance. States set

different thresholds for this additional assistance. New Jersey and New Hampshire define eligibility at 250 percent of the federal poverty level. Massachusetts sets it at 85 percent of the state median income level, which is at about the same level. All three states have waiting lists for these subsidized spots, however, and families are required to pay sliding scale co-pays.

The states have similar qualification requirements for childcare workers, with only New Jersey requiring a bachelor's degree for childcare directors. New Hampshire requires an associate's degree for a center director and Massachusetts requires 16 college credits. Childcare teachers in all three states need college credits or a child development associate (CDA) credential. Massachusetts notably offers a scholarship for current childcare workers who want to pursue a post-secondary degree, in an effort to build capacity in the system.

Pay is also low across the board. In the three states, the average pay for childcare workers was only about 45

percent of the average state wage. Childcare director wages in the states are higher and more comparable to the international average wages, all at about the average state/jurisdiction wage. All three states assess childcare quality and support centers in need of help through quality rating and improvement systems, although only Massachusetts offers financial incentives to centers that improve their ratings and requires centers that receive state subsidies to achieve at least a level 3 of their five-level scale. All three states also have early learning standards to guide programming in childcare centers.

Chart 5: Top-Performing States: High Quality Childcare

	Percent of children in childcare (capacity number: based on number of licensed slots/total cohort)	Average full cost of monthly center care for infants	Subsidies for childcare	Average childcare worker salary /percent of jurisdiction average salary
MA	54 (4-years-old and under)	\$1,424	Subsidies for families on public assistance and working families with incomes below 85 percent of the state median income (\$60,033 in 2015)	\$27,610/45 percent
NH	62 (4-years-old and under)	\$1,033	Subsidies for families on public assistance and working families with incomes below 250 percent of the federal poverty level (\$60,625 in 2015)	\$22,200/44 percent
NJ	n.d.	\$962	Subsidies for families on public assistance and working families with incomes below 250 percent of the federal poverty level (\$60,625 in 2015)	\$25,040/44 percent
MD	62 (4-years-old and under)	\$1227	Subsidies for families on public assistance and working families with incomes below 41 percent of the state median income level (\$31,087 in 2015) Note: currently frozen at 35 percent of state median income level	\$29,060/41 percent

High-Quality Early Childhood Education

Compulsory school begins at age 6 in the benchmark states. Kindergarten access for 5-year-olds varies among the states. Massachusetts does not require districts to offer kindergarten but funds kindergarten through a competitive grant process throughout much of the state. Still, most districts in the state offer full day kindergarten, funding it through a combination of state grant funds, local funds, Title I funds and tuition. New Hampshire requires that districts offer half-day kindergarten, but here too most districts fund full-day programs supplementing the state funding with local funds and tuition. New Hampshire Governor Sununu just put forward a proposal for the state to fund full-day kindergarten, but it is too early to know if that will be enacted.

New Jersey is unique, in that they have been required by the courts to fund full-day kindergarten and pre-K in the lowest income districts in the state for more than 20 years, and they added this requirement for all other low-income children across the state more recently (funded initially with a federal Preschool Development grant). The state does not require other districts to offer kindergarten but does pay for half-day kindergarten for those that do.

The vast majority (about 90 percent) of students attend kindergarten in all three states, with 94, 74 and 84 percent of those student in full day programs in Massachusetts, New Hampshire and New Jersey, respectively.

All benchmark states offer subsidized preschool education for disadvantaged 3- and 4-year-olds, including low-income children and those with disabilities. They fund this through a combination of federal Head Start funds (including Head Start special education

funds), federal childcare development block grant funds and state funding. All but five states (including New Hampshire) invest state funds in preschool education. Most states do not fund universal preschool education, but instead limit their investment to low-income children. Only three states (Florida, Georgia and Oklahoma) have universal programs for 4-year-olds. All states are required by the federal Individuals with Disabilities Act (IDEA) to provide “free appropriate public education services” (“FAPE”) for disabled 3-, 4- and 5-year-olds. Eligibility requires children to have significant delays in one or more areas of development, such as learning, speaking or play. Only four states, none of them top performers — Alaska, New York, Texas and Illinois — have policies requiring state-funded pre-K programs to provide instruction for English language learners.

Massachusetts developed the Universal Pre-K program in 2007 that gives grants to districts to expand access to pre-K program, with priority given to low-income children. The original intent of the program was to fund universal pre-K, but state funding fell short so it was revised to a grant program.

Massachusetts received a federal Pre-School Expansion grant in 2014, which has enabled the state to further expand access for low-income children. New Hampshire has no state pre-K program other than the federally required program for children with disabilities. The state applied for a federal Pre-School Development grant but did not receive funding. New Jersey, as mentioned above, has a full day pre-K program for children in the lowest income districts and low-income children across the state.

There is a distinction in both qualifications and wages for teachers

who teach pre-K for 4-year-olds in the public schools and those who teach pre-K or preschool for 4-year-olds in community-based programs. Public schools require pre-K instructors to have full teaching certifications, whereas the qualifications for those teaching 4-year-olds in community-based programs generally must follow guidelines for childcare for that age group. Massachusetts and New Jersey require pre-K teachers in the public school to have teaching licenses, both requiring bachelor's degrees. Community-based preschool programs have the same staff licensing requirements as childcare centers, however, with teachers required to have college credits but not a full

degree, and directors required to have a bachelor's degree in New Jersey, and an associate's degree in New Hampshire and college credits in Massachusetts. Salary levels for pre-K teachers and community-based preschools reflect this distinction in qualifications: pre-K teacher salaries are about the state average salary in Massachusetts (106 percent) and New Jersey (117 percent) but preschool teacher salaries are only about 60 percent of the average state wage for all workers in Massachusetts and New Hampshire and 73 percent in New Jersey.

Chart 6: Top-Performing States: High Quality Preschool/Pre-K

	Percent preschool enrollment (3-4-year-olds in public or private preschool/5-year-olds in kindergarten)	Public preschool costs/pre-K/kindergarten costs	Average preschool teacher salary/percent of jurisdiction average salary
MA	58 (3-4-year-olds) 90 (5-year-olds)	Free or subsidized preschool or low-income children Free full day kindergarten for most children	\$35,900/60 percent
NH	53 (3-4-year-olds) 92 (5-year-olds)	Subsidized for low-income families Free half day kindergarten	\$30,000/60 percent
NJ	64 (3-4-year-olds) 85 (5-year-olds)	Free full day pre-K and kindergarten for 3-5-year-olds in low income districts and other low-income 3-5-year-olds Free half day kindergarten, some districts have free full day	\$40,720/73 percent
MD	57 (3-4-year olds) All 5-year-olds	Free half-day pre-K for low-income children Free full day kindergarten compulsory for all children	\$35,090/63 percent

All three states have preschool/pre-K learning standards and their preschool programs are part of the state quality rating and improvement systems (QRIS). As mentioned above, Massachusetts is the only state among the benchmark states that offers incentives for programs to improve their ratings (with higher subsidy reimbursements or higher ratings) and also reimburses training costs for staff wishing to upgrade their qualifications.

All of the benchmark states focus on monitoring readiness for kindergarten. Massachusetts and New Jersey are piloting kindergarten readiness measures, and New Jersey plans to report these results publically when the system is fully implemented in 2019. New Hampshire requires programs to use one of two different readiness tools but does not require public reporting.

How Does Maryland Compare?

Support Services for Children 0-3

The top-performing international jurisdictions provide either free health care to all citizens (Ontario and Finland) or guarantee health insurance coverage to citizens (Singapore and Shanghai, although the latter is still working to extend those benefits to its migrant population.) Maryland, like all U.S. states, does not offer these benefits to its citizens universally. Like all states, Maryland provides health coverage to low-income families, including children, through Medicaid. Maryland has elected not to offer CHIP funding, but it has done so because it has funded Medicaid to expand eligibility for children in families making up to 317 percent of the federal poverty level (\$77,982 for a family of four), higher than all the benchmark states. Still, New Jersey's income threshold for CHIP is higher, at 350 percent of the federal poverty level or \$86,100 for a family of

four. Maryland sets its income eligibility for pregnant women much higher than the benchmark states as well, at 259 percent of the federal poverty level compared to about 200 percent in the benchmark states.

Home visits to new mothers are a common practice in some of the international jurisdictions, where it is done for all new mothers in Finland and Shanghai and for disadvantaged populations in Ontario. In Maryland, home visits are increasingly used as a strategy to reach low-income families. Medicaid and CHIP insurance cover basic maternal and child health services, and federal funding from the Affordable Care Act's MIECHVP for home visiting has allowed the state to significantly increase outreach to disadvantaged new families in recent years, using the Parent-Nurse Partnerships and Healthy Families America models. Nurse-Parent Partnerships focus on maternal and child health; and Healthy Families America develops strategies to reach specific target populations such as families at risk for drug or substance abuse. Maryland has longstanding state-funded home visiting programs focused on parent education and supports several national model programs, including Home Instruction for Parents of Pre-School Youngsters (HIPPY) and Parents as Teachers. HIPPY and Parents as Teachers focuses on parent education with HIPPY focusing on reading and school readiness and Parents as Teachers training parents to identify developmental milestones and help their children meet them. Maryland, like Massachusetts and New Jersey has a broad set of home visiting programs, covering both health services and parent education. Maryland is notable among the benchmark states in funding several statewide models in addition to the federally funded programs. Maryland's

model is less expansive than Shanghai and Finland's, but similar to Singapore's and Ontario's. Home visits for new mothers are not done across the population in Singapore and Ontario, but are done as part of specific initiatives aimed at providing social services to disadvantaged families more like how it is practiced in the United States.

Maryland, like Massachusetts and New Hampshire, does not support paid medical leave as is provided in all of the top-performing international jurisdictions. That said, the state legislature just created a workgroup to study the issue and make recommendations. If the state does enact a paid medical leave policy, this will make Maryland one of the few states with such a policy, along with New Jersey among the benchmark states. While this would be notable, it would be nowhere near the level of support provided to families in the top-performing international jurisdictions. In those places, paid leave for families ranges from 4.5 months in Singapore to over a year in Finland. In Finland, families also receive monthly child allowances to help with the costs of raising a family until children are in their teens. These payments are in addition to the childcare benefits system which ensures free or low cost childcare for all families. A "place" in a childcare center is considered a "right" in Finland and sufficient places are available.

Maryland, like the other benchmark states, has created networks of community-based centers throughout the state to coordinate and provide services for families with young children. Maryland uses two primary strategies: Family Support Centers and Judy Centers. The Maryland Family Network operates 26 Family Support Centers located in low-income

communities across the state. The Support Centers are open to all families with children under age 4, regardless of income level. They offer parenting education, workforce programs, home visitation, infant and toddler education programs, and connect families with programs like Head Start and other services, if they are eligible.

Maryland's other strategy to reach families with young children is Judy Centers. These centers target low-income children in neighborhoods close to Title I elementary schools, and coordinate providers to offer childcare referrals, parenting education, health care (including basic screening and mental health services), food services, and enrollment in preschool and pre-K. Judy Centers coordinate existing services, while Family Support Centers offer programs for families in addition to connecting them to services. The Judy Center model is different from coordinating networks in the benchmark states in that they are explicitly linked to Title I schools and focused on school readiness.

Massachusetts is the only benchmark state to have a network of centers analogous to Maryland's Family Support Centers, with its Family Resource Centers, that provides more than a coordinating function. This serves a critical need. Massachusetts, unlike Maryland, has established centers in each county in the state whereas Maryland has located them in communities in need. This targeted approach makes sense, but does leave many communities without a center.

With these strategies, Maryland only reaches a small fraction of families in the state. The 51 Judy Centers serve about 18,000 children (almost 60 percent of those who enroll in kindergarten in the Title 1 schools they are located near or

at) and the Family Support Centers serve about 8,000 families each year. These numbers, while impressive, together still represent less than 5

percent of the cohort of children and families under age 4 in the state. This “reach” is similar to that of the benchmark states.

Chart 7: How Maryland Compares: Supports for Families with Children 0-3

	Total paid leave for parents	Financial benefits for young children	Maternal and child health care
Finland	26 months	Monthly allowance (US\$103) for each child through age 17; supplements for single parents (US\$53)	Universal health care
Ontario	12 months	Canada Child Benefit: Paid on a sliding scale for families with income under US\$140,000 for Up to US\$533 /month each child under age 6 and US\$392 for each child from 6-17 Ontario Child Benefit: US\$996 per child annually for families with income below US\$22,042	Universal health care
Shanghai	5.5 months	None	Goal of universal health care coverage by 2020 for all; current estimate at over 90 percent but closer to 65 percent if migrant workers included
Singapore	4.5 months	One-time baby bonus for each child (US\$5737 for the first two children; US\$7172 for each additional) Child Development Account (CDA) for educational enrichment with US\$2141 per child at birth and up to US\$2141 per year in matching contributions each year thereafter.	
MA	None	None	Low-income families with young children covered by Medicaid with incomes up to \$49,200 and children covered by CHIP in families up to \$73,800
NH	None	None	Low-income families with young children covered by Medicaid with incomes up to \$78,228
NJ	6 weeks	None	Low-income families with young children covered by Medicaid with incomes up to \$47,724 and children covered by CHIP in families with incomes up to \$86,100
MD	none	None	Low-income families with young children covered by Medicaid, with incomes up to \$77,982

These numbers pale in comparison the reach of the top-performing international jurisdictions, whose services tend to be universal with extra supports for the disadvantaged families that are reached. In Singapore, Ontario and Finland, almost all low-income families are connected to services and supports, and those who are not are aggressively sought after. Singapore, for example, launched a new program to visit all families in neighborhoods with low enrollment in kindergartens for 4- and 5-year-olds to encourage them to enroll their children. Finland's maternal and child health clinics are part of a national network that enrolls virtually all families. Children are seen regularly, screened and transitioned to school health clinics once they reach school age.

High-Quality Childcare

Maryland houses oversight for childcare and early education in the Department of Education. The Department licenses childcare centers, monitors their quality, oversees subsidies for low-income families, develops early learning standards and provides professional development and tuition benefits for staff hoping to improve their skill levels. This is a different governance model than the benchmark states.

Massachusetts has a separate department for early childhood education and care, while New Hampshire and New Jersey divide oversight between their health and human services agencies (for childcare) and their departments of education (for preschool/pre-K). In three of the international jurisdictions, childcare is under the auspices of the education agency like in Maryland, with the exception of Singapore where a new agency was created to oversee early care and education. Maryland's choice to centralize early childhood education

and care in the education department was intended to better coordinate between the parts of the system and better align childcare and primary school. While this goal is important, tradeoffs include less input from health care agencies and the risk of diluting focus on early education because it is housed in one agency.

Maryland, like the other benchmark states, has a quality rating and improvement system (QRIS), Maryland EXCELS. Only Maryland and Massachusetts, among the states analyzed, have aggressively leveraged their QRIS systems to drive improvement in the state. Both require centers to achieve a certain ranking on the QRIS in order to receive state funds and both have "tiered reimbursements", offering higher reimbursement for higher rankings on the state framework. Both also offer state funding for professional development for staff to improve their skills, although Massachusetts goes further in offering tuition benefits for current childcare staff to pursue a post-secondary credential. Maryland did this with federal funds (through its Race to the Top-Early Learning Challenge grant) but ended the program when the federal funds ended. The QRIS strategy is analogous to the monitoring system for early childhood education and care in the top-performing systems, where central ministries or commissions take charge for inspecting programs and evaluating them against a set of standards for licensure.

Maryland faces a challenge in raising the attractiveness of work in the childcare sector. Like the other benchmark states, the average salary for childcare workers is less than half the average state wage for all workers. Salaries for childcare workers are higher, as a percent of average

jurisdiction wage, in all of the international jurisdictions, at between 60 and 80 percent of the average jurisdiction wage. This is a clear distinction between the United States and the top-performing jurisdictions.

Qualifications requirements for childcare workers in Maryland are typical of what is required in most states, including the benchmark states: childcare workers in Maryland need 9 college credits of early childhood work and directors of larger centers are required to have an Associate's degree. Professional development requirements for staff are also typical, with about 12 hours each year required. Only New Jersey, of the benchmark states, requires a bachelor's degree for center directors. Maryland's Family Network, notably, offers training, coaching and mentoring to childcare professionals in each Support Center.

The international jurisdictions vary in their qualifications for childcare workers, but they are generally higher and all are moving towards requiring higher qualifications. All four jurisdictions require at least a post-secondary credential in early childhood education for all but assistant level teachers or aides. In Finland, there is also a requirement for every third staff member in a childcare center to be a credentialed teacher with a bachelor's degree. Ontario requires that every third staff person has a two-year diploma in early childhood education, as a first step in their provincial plan for raising the qualification levels of the workforce. The province is offering tuition for any current worker to pursue a diploma. Singapore created new qualifications in early childhood care and education and a career ladder with three tracks: an Educarer track for care of 2-4-year-olds, a Teacher track for 4-6-year-olds and a Leader track. The Beginning Educarer

requires a post-secondary certificate in early childhood education but each step up the ladder requires additional professional development competencies or professional qualifications, and also allows progression to either the Teacher or the Leader track. Singapore announced that a new professional development policy will be unveiled for the sector later in 2017 to align with the career ladder.

Maryland's childcare subsidies for low-income families are notably lower than those provided in the benchmark states and in the top-performing international jurisdictions. They are not sufficient to make childcare affordable for many families. Although this issue is true in all the benchmark jurisdictions other than Finland, childcare subsidies are the lowest in Maryland of any of the jurisdictions benchmarked. Maryland sets its guidelines for eligibility at 41 percent of the state median income, but funding shortages have resulted in freezing access to the subsidies for the top tiers of income eligibility and it is currently at 35 percent of the state median income. This means the subsidy program is closed to families earning more than about \$30,000 each year, which is half the income level for eligibility in the benchmark states which are all at about \$60,000. With childcare costs for infants in licensed programs averaging over \$1,200 a month in Maryland, this puts childcare out of reach for many families. For those who receive subsidies, the level of the subsidy is an issue as well. Maryland has set subsidy levels at a rate that allows families to access less than 10 percent of the childcare programs in the state. That level is not within the guidelines set by the federal government for the Childcare Development block grants, so this issue

has been front and center in the state recently.

Affordability is not just an issue in Maryland. All three benchmark states have long waiting lists for childcare subsidies for working families, with the

Massachusetts list topping 4,000 families this year. Still, Maryland's low threshold for eligibility stands out nationally, not just among the benchmark states. Wait lists in other states are for families at much higher income levels than in Maryland.

Chart 8: How Maryland Compares: Childcare

	Percent children in childcare (public and private)*	Average full cost of monthly center care	Subsidies for childcare	Average childcare worker salary (as a percent of jurisdiction average salary)
Finland	52%	\$315	Free for families earning less than \$36,000; income based subsidies for families with income up to about \$71,000	\$28,906 71%
Ontario	15 (0-1-year-olds) 62 (2-4-year-olds)	\$1275 (infant) \$974 (toddler)	Ontario Childcare Subsidy for families with income under US\$29,391 to cover 75-100 percent of cost	\$28,664 80%
Shanghai	20 (2-3-year-olds)	n/a	Subsidies for low-income families	n/a
Singapore	16 (0-2-year-olds) 63 (3-year-olds)	\$1056 (infant) \$725 (toddler)	Universal subsidy: \$430/month for infant and \$215/month for toddler care Families with income below \$64,368 receive additional \$315 toddler and \$386 for infants	\$15,450-\$18,024 (range) 51-60%
MA	54 (4 years old and under)	\$1424 (infant)	Subsidies for families on public assistance and working families with incomes below 85 percent of the state median income (\$60,033 in 2015)	\$27,610 45%
NH	62 (4 years old and under)	\$1033 (infant)	Subsidies for families on public assistance and working families with incomes below 250 percent of the federal poverty level (\$60,625 in 2015)	\$22,200 44%
NJ	n/a	\$962 (infant)	Subsidies for families on public assistance and working families with incomes below 250 percent of the federal poverty level (\$60,625 in 2015)	\$25,040 44%
MD	62 (4 years old and under)	\$1227 (infant)	Subsidies for families on public assistance and working families with incomes below 41 percent of the state median income (\$31,087 in 2015) currently frozen at 35 percent	\$29,060 41%

* US numbers: capacity based on number of licensed slots / total cohort

Accessibility and affordability of childcare is an issue in the international jurisdictions as well, other than Finland where there is adequate childcare capacity. Ontario has had to address these issues, with the highest cost of childcare in Canada and shortages of seats in the centers that exist. The province has committed to funding an additional 100,000 spaces in licensed centers by 2020, and has had to raise subsidy levels for low-income families to address the costs. Shanghai and Singapore also face high demand for childcare, and are committing significant resources to expanding the sector. As Singapore expands availability for families, it is committed to making it possible for all families to access childcare, with high levels of subsidies for low- and middle-income families and by subsidizing private providers with the agreement that they keep their fees low for all families.

High-Quality Early Childhood Education

Maryland is notable among the benchmark states, and nationally, for the reach of its early childhood education programming. Maryland is one of a handful of states with compulsory kindergarten starting at the age of 5, and one of 13 states (plus D.C.) that require districts to offer full-day kindergarten. In other states, kindergarten is optional but free, and in the international jurisdictions, school for five-year-olds is optional but highly subsidized. Therefore, Maryland does better than any of the benchmark jurisdictions at offering education to five-year-olds. The state also requires districts to offer half-day pre-K for disadvantaged students, and has been able to extend this to full-day in many communities. The state is now considering extending this to all 4-year-olds. This is more extensive than any of the benchmark states, except for New

Jersey's court-mandated full day pre-K and kindergarten for all children in the lowest-income districts in the state, which has since been extended to all low-income children across the state.

Maryland's EXCELS QRIS also applies to these programs, and again, offers financial incentives for improvement and resources for helping programs improve. Notably, the state offers tuition reimbursements to encourage pre-K teachers to pursue post-secondary degrees. Salaries for community-based pre-K teachers and those teaching in the public schools in Maryland are comparable to those in the benchmark states, with much lower salaries for community-based preschool/pre-K teachers (about 60 percent of the state average salary) compared to salaries for public school-based pre-K teachers (at about the average state salary level). Salaries in all of the benchmark states and Maryland are lower than in the international jurisdictions for preschool/pre-K teachers in the community-based programs.

Maryland is the only state among the benchmark states with a fully implemented kindergarten readiness assessment system. Even though this is in some flux now, with a shift to make it a local option of whether to assess a sample or the full cohort of pre-kindergarteners. Maryland has had a similar assessment for many years though, reflecting a commitment to monitoring school readiness. The state has also paid attention to alignment issues between early education and elementary school, with a 0-8 early learning framework that follows development from early education to grade 2. New Jersey and Massachusetts are piloting similar assessments and New Hampshire requires districts to use a state approved assessment but leaves it to districts to decide what to do with

the data and whether to report it publically.

The international jurisdictions all offer public preschool programs (called kindergartens in Singapore, Ontario and Shanghai and preschools in Finland) for all children. They are free in Ontario and highly subsidized in Singapore, Shanghai and Finland so that any family who wants to enroll their child is able to do so. Participation is high in all of the jurisdictions. Qualifications for teachers in the international jurisdictions have a similar divide: public pre-K teachers are required to have a full teacher licenses, with a bachelor's degree, and qualifications for teachers in preschool programs in the community-based

programs require only post-secondary certifications. Finland stands out here, as it requires every third teacher in community-based programs to have a teaching qualification, which requires a bachelors degree. Singapore requires a two- or three-year diploma in early childhood education from a polytechnic school, and is investing significant funds in raising the qualifications levels for all teachers in early childhood education. As mentioned earlier, a new career ladder for early childhood education was developed and the government is funding both current and new educators to study for these credentials. All the jurisdictions have early learning curriculum for their programs.

Chart 9: How Maryland Compares: Early Childhood Education

	Percent preschool enrollment*	Preschool costs (public)	Average preschool teacher salary/percent of jurisdiction average salary
Finland	74 (4-year-olds) 79 (5-year-olds)	Free public preschool for 6-year-olds and 4-5-year-olds in families with income below \$36,000; subsidies for families with income up to \$71,000; \$315 for other families	\$34,673 85 percent
Ontario	48 (4-year-olds) 92 (5-year-olds)	Free full-day kindergarten for 4-5-year-olds	\$30,841-\$40,020 86-112 percent
Shanghai	98 (4-5-year-olds)	\$72-\$160 / month depending on grade Fees waived for low-income families	n.d.
Singapore	90 (4-year-olds) 92 (5-year-olds)	\$114 / month Fee assistance for families with incomes up to \$51,000	\$18,881-\$25,747 / 63-85 percent
MA	58 (3-4-year-olds) 90 (5-year-olds)	Free or subsidized preschool or low-income children Free full-day kindergarten for most children	\$35,90 60 percent
NH	53 (3-4-year-olds) 92 (5-year-olds)	Subsidized for low-income families Free half-day kindergarten	\$30,000 60 percent
NJ	64 (3-4-year-olds) 85 (5-year-olds)	Free full-day pre-k and kindergarten for 3-5-year-olds in low income districts and other low-income 3-05-year-olds Free half-day kindergarten, some districts have free full-day	\$40,720 73 percent
MD	57 (3-4-year-olds) All 5-year-olds	Free half-day pre-k and full-day kindergarten for all children Subsidized for low-income 3-4-year-old and children with special needs	\$35,090 63 percent

* US numbers are 3-4-year-olds in public or private preschool / 5-year-olds in kindergarten

Recommendations for Maryland

Maryland has been a national leader in early childhood education for many years, with many of the current efforts in place for 20 or more years. The state has, over the years, strengthened and expanded its system with a common quality rating system with incentives for program improvement and upgrading of the workforce that go beyond what the other benchmark states have done. It has also dramatically expanded early childhood programming for low-income children in the state and is among one of only a few states that funds full-day kindergarten for all students.

Still, Maryland faces real issues in ensuring affordable childcare for families, expanding the reach of its supports and services for children ages 0-3 and their families, and the on-going expansion, improvement and intensification of early childhood education programming for pre-kindergarten children. We recommend the following priority strategies:

Expand the reach and comprehensiveness of support services for children ages 0-3 and their families:

The top-performing jurisdictions understand the importance of early support for families, to ensure that children are ready for school and parents are able and ready to support them. Finland is a clear example of this universal reach, but the other international jurisdictions are moving in that direction. Maryland's efforts to support the youngest children and their families are a very good foundation to enable it to reach this benchmark. The issue is the scale of the efforts. Judy Centers are an innovative model, using the public school as a community hub for connecting young children with available services in the community and focusing on readiness for school. There

are Judy Centers at only 51 Title I schools, however, with hundreds of Title I schools in the state and Baltimore alone has more than 130. And as Judy Centers can only coordinate available services within a community, they do not provide additional services that might be lacking. Family Support Centers, smartly located in high-need communities, offer programming for families and their children along with coordination services. Their universal open-door policy, inviting all families regardless of income, is a promising approach as it removes the stigma of the center and introduces opportunities for often isolated disadvantaged populations of learning alongside a diversity of families. But again, they only reach 8,000 families a year, only a very small fraction of families who could benefit from these services.

Make childcare for working families affordable: The government policies in the top-performing jurisdictions are focused on ensuring low- and middle-income families have access to affordable care, especially in Finland and Singapore where they see this as both critical for children but critical for their national economic security as well. The price of quality childcare in Maryland is a critical issue for families. Eligibility for subsidies, the level of subsidies and the availability of the subsidies are all issues being discussed in the legislature now, but their importance cannot be overstated. Maryland should, at a minimum, fund their subsidies at a level that allows families to access quality care and offers the subsidies to all families that meet its eligibility guidelines. Childcare makes employment possible for families, and families will turn to sub-adequate care for young children if they have no other options. This can only cost the state in the long-run.

Add early childhood educators to a state-wide educator career ladder and invest in the capacity of the early childhood education workforce: In Building Block 5, we recommended that Maryland create an educator career ladder with clearly defined requirements for each step and a progression of roles with increasing responsibility. The ladder would serve as a framework for professional development and performance appraisal. Tying early childhood education to the K-12 career ladder, as is done in Singapore, would in and of itself raise the profile of what is sometimes not seen as a high status and important profession. It would also serve as a recruiting tool to encourage a higher skill pool of applicants to the profession. The state would, however, need to address the salary issue alongside any effort to raise requirements for early childhood educators. It would also need to increase the level of state assistance for professional development for the existing workforce and tuition for workers to pursue higher degrees to increase their expertise. Maryland could also build on the Family Support Center model of support for childcare professionals, expanding the efforts to provide mentorships and collaborative planning and learning opportunities for early childhood educators in much the same way the state is trying to do for K-12 teachers.

Expand enrollment of all children in quality pre-K programs and continue to add wrap-around education, health and support services for children and their families: The international jurisdictions provide a much higher level of financial supports to new families than Maryland or any U.S. state, with maternity and parental leaves of four months to over a year; universal access to maternal and child health services, often including home visiting; family and childcare allowances enabling low-income families to access childcare, and much more extensive, often universal, systems to provide parent education, infant/toddler education, developmental screenings and referrals to childcare and early childhood education to families with young children. Maryland has made much progress in expanding programming for low-income 3- and 4-year-olds, but there are still many children without access to this programming in the state. And many of the current publically funded programs for are still half-day, which is difficult for working families and a missed opportunity to provide more support for these children to prepare them for school. Maryland is to be commended on its efforts to focus expansion of pre-K on quality programs. The other issue is to continue work to connect the education programs available to this population with the additional supports and services they and their families will need to ensure they are ready for school and are likely to continue to succeed.

¹ <https://www.thestar.com/news/gta/2016/09/23/ontario-urged-to-expand-daycare-in-non-profit-sector.html>

² No average available. Salary taken from provincial labor agreement.

³ No average available. Salary levels taken from national pay scales for different levels on the childcare career ladder.

⁴ Based on calculations of the numbers served by coordinating networks in the benchmark and other states and the full cohorts of children in those states.

⁵ <https://www.dol.gov/general/topic/benefits-leave/fmla>

BUILDING BLOCK 2



PROVIDE MORE RESOURCES FOR AT-RISK STUDENTS

Overview of Maryland School Funding

Maryland was one of the first states to reform its education finance system to ensure that students received adequate funds to achieve the state education standards. In 1999, a commission, known as the Thornton Commission, was convened by the state legislature to recommend changes to the state's funding formula so that all students would have the opportunity to meet state education standards. Cost studies were commissioned to determine a basic level of funding for all students annually plus additional funds for specific populations of at-risk students. There were two types of cost studies commissioned: a professional judgment and a successful schools approach. The professional judgment approach uses panels of educators to determine the kind of resources needed to achieve a set of objectives in a proto-typical school. The successful schools approach looks at the spending patterns of schools that meet those objectives.

The Commission ultimately chose to recommend the foundation grant amount (\$5969) recommended by the successful schools study, as it was based on actual spending, had a methodology that linked spending to achievement of state standards, and it had been upheld by the courts in at least one other state as a sound basis for calculating adequate education funding. To determine the amount of additional funds the state and counties would contribute for at-risk students, the Commission had to identify “weights” by category of at-risk students that would apply as an additional amount to the base funding. The Commission chose to recommend the weights suggested by the professional judgment study conducted by a third

party, as the successful school study did not propose weights. The following weights were recommended before adjustments were made:

- 1.39 for low-income students
- 1.17 for special education students
- 1.00 for English language learners

To determine the state share for the foundation grant, the state funds for the at-risk groups, and the minimum local share of the foundation grant, the Commission recommended the existing formula using assessed property values and taxable income of county residents. The Commission also recommended that the state should guarantee, at minimum, in any given year that it would contribute 15 percent of the per student amount of the foundation grant to each county, regardless of county wealth. The foundation grant would also be adjusted based on a geographic cost index, which would be devised to account for the differences in the cost of educational expenses across the state. The Commission also recommended a formula for adjusting the base amount to account for inflation starting in 2005. The formula that was recommended was significantly higher (\$1.1 billion) than what Maryland was spending at the time.

The *Bridge to Excellence in Public Schools Act of 2002* codified most of the Thornton recommendations in state law. The Act put in place the recommended foundation grant amount and weights, both adjusted to account for overlaps of populations in more than one category and to remove the portion of federal and other funds included in them. This adjustment was recommended by the Commission. The foundation grant amount put in place in the 2002 law was

\$5443 (excluding retirement) and the weights were:

- .97 for low income students
- .99 for ELL students
- .74 for special education students

The Act put in place the Thornton recommendations for determining the local share of the foundation grant and the additional funding for at-risk students for each county. However, the Act also added a requirement that the state pay at least 40 percent of the at-risk amounts for each school system, regardless of the wealth of the county. While the counties were required to pay their share of the foundation grants, the law did not *require* them to pay the local share amount for at-risk students determined by the weighted formulas (nor did the Thornton Commission recommendations).

Local school systems were given broad flexibility to determine how best to use the state aid to meet the needs of their students but were required to develop a master plan for using the funds to increase student achievement with accountability measures focused on outcomes. The new system was phased in over five years (FY 2004 to 2008). Since FY 2008, the formulas were to take into account changes in school enrollment and inflation annually.

However, there have been a number of reasons why schools have not been fully-funded under the formulas put into law in 2002. First, the foundation formula's inflation factor was frozen in FY 2009 through 2012 due to state budget shortfalls and capped at 1 percent from FY 2013 through 2015. And second, during the great recession, several counties received waivers from the maintenance of effort requirement, which allowed them to rebase their local contribution to a lower amount. In 2012, legislation clarified the conditions under

which counties may be eligible for a maintenance of effort waiver and also shifted the penalty for not complying with the "local maintenance of effort" requirement from the school system to the county.

The *Bridge to Excellence in Public Schools Act of 2002* required a follow-up adequacy study to be done 10 years after the new funding systems were implemented. This study was delayed several years and completed by APA Consulting in December of 2016. The study authors recommended **raising the base funding** amount from \$6860 to \$10,880 (in FY 2015 dollars) and **changing the weights** to:

- .35 for low-income students
- .35 for ELL students
- .91 for special education

They also added a new "category" of weights for pre-kindergarten to be set at .26 weighting.

The rationale for this new formula, according to the APA study authors, was that the costs for education had risen since 2002, and more demands were placed on schools. They point to the implementation of the Common Core State Standards and the state's new College and Career Ready state standards and argued that the schools have to help students reach an even higher standard. To get all students there, not just at-risk students, they argued for an increase in system-wide funding rather than funding just targeted at those at-risk. In particular, they argued that the new standards and accountability requirements would mean that schools had to spend more on all students to:

- Decrease class size
- Increase instructional staff, including instructional coaches

- Increase planning time for teachers
- Hire more school counselors, nurses and behavioral specialists for all students
- Create technology-rich learning environments
- Provide pre-K for all 4-year-olds
- Establish more district-level school personnel to support schools

In addition, they argued that the higher overall levels and concentrations of poverty in the state argue for more base funding across the counties rather than targeted funds on specific students.

APA also made some other key recommendations:

- 1) They recommended **changing the formula for calculating the local share** of school funding to weight taxable income more than property wealth.
- 2) They recommended **eliminating a minimum level of state aid** for both the foundation grant and the at-risk funding for all counties, arguing that counties that can afford to pay the full amount should and the state funds should be reserved for supplementing the poorer districts.
- 3) They recommend **requiring counties to pay their full share** of aid for at-risk students.

If all of the APA recommendations were put in place, the schools would receive an additional \$2.9 billion, including \$1.9 billion in state aid and \$1 billion in local funding.

With this historical overview, a description of how Maryland currently funds its schools, and a summary of the

recommendations made by the consultants hired to review funding adequacy for the state, we turn to an analysis of how Maryland compares to top-performing U.S. states and top-performing international jurisdictions in providing equitable and adequate financial and human resources to students most at-risk.

How Does Maryland Compare?

Equitable and adequate financial resources for at-risk students:

Per-pupil spending in Maryland is the 10th highest among states, but drops to 16th highest when adjusted for regional cost differences. While Maryland spends more than many states on education, we would expect it to be a higher spender given its wealth, as Maryland's median income level is the highest in the nation. New Jersey and Massachusetts both spend more — they are ranked 3rd and 7th — and New Hampshire is ranked about the same as Maryland at 9th highest, although once regional differences are taken into account it is also ranked higher than Maryland at 7th highest.

Maryland's per-pupil foundation grant of \$6,964 (FY2017) is lower than the foundation grants in either Massachusetts or New Jersey. The grant in Massachusetts is \$6,927-\$8,637 (FY2017), depending on the level of school, and it is \$11,195 (FY2017) in New Jersey. It is almost double that of New Hampshire at \$3,561, but New Hampshire is a special case, with the highest percentage in the country of education funding from local sources rather than the state.

Maryland adds weights to its foundation grant for three populations of at-risk students: English language learners (ELL), low-income students and special education students. Maryland's

ELL and low-income weights are among the highest in the country, while the special education weight is among the lowest.¹

- The ELL weight (.99) is much higher than the benchmark states, and the highest nationally. Massachusetts' weight is .07-.33, depending on grade level, New Jersey's is .5 and New Hampshire's is .19.
- The low-income weight (.97) is higher than the benchmark states and among the highest in the country. Massachusetts is .26-.33, depending on grade level. New Jersey and New Hampshire have ranges that vary depending on concentration of poverty. New Jersey's range is .33 to .47 and New Hampshire's range is .12 to .48. Maine's weight of 1.2 is the highest weight among the 31 states that apply a weight for low-income students; Maryland's weight is among the highest.
- The special education weight (.74) in Maryland is lower than the weights in Massachusetts (1.27) and New Jersey (.17 to 1.33), but higher than New Hampshire (.52). Among the 20 states (and D.C.) that add weights for special education, Maryland is among the lower ones. States vary in how they do this, with nine applying a single weight like Maryland does but with most states applying different weights depending on the disability. Among the eight

other states using a single weight, five apply a higher weight than Maryland. Most of the states using multiple weights do as well.

- Notably, New Hampshire adds a weight of .19 for third graders who are not reading on grade level.

Maryland does not do well on measures of funding equity. The state spends 4.9 percent **less** money on poor school districts than on wealthy ones, when looking at the overall amount of state and local spending per-pupil. That is lower than all of the benchmark states and the 16th most regressive among all states. When federal funding is added in, Maryland spends 1.5 percent **more** on poor school districts than wealthy ones, which is the 9th most regressive among states.

Maryland's inequity in funding between poor and wealthy school districts is occurring even with a funding formula with relatively high weights for at-risk students. Possible explanations for the inequality of funding are:

- Not all counties fully fund the local share of the at-risk weights, as they are not required to by state law;
- The formula Maryland uses to calculate the local share of the foundation grant and the at-risk funding favors property wealth over income level of the county populations, which does not fully capture the economic disadvantage in some counties.

Chart 1: Funding for At-Risk Students in the Top-performing States and Maryland

	MA	NH	NJ	MD
State Median Income (BLS, 2015)	\$67,846	\$70,303	\$72,222	\$75,847
Ranking among all states of total per pupil revenue (NCES, 2014)^a	7	9	3	10
Per pupil spending and rank among all states (2013), adjusted for regional costs difference^a (KidsCount, 2016)	\$13,546 (13)	\$14,718 (7)	\$15,742 (5)	\$12,679 (16)
Percent revenue from federal, state and local funds (NCES, 2016)^a	5.4 federal 39.2 state 55.4 local	5.5 federal 60.4 state 34.1 local	4.3 federal 40.6 state 55.1 local	5.9 federal 44.1 state 50.0 local
Base state grant (FY17)	\$6927-\$8637, depending on level of school ^b	\$3,561	\$11,195	\$6964
Percent additional for ELLs	7-33, depending on grade level	19	50	99
Percent additional for special education students	127	52	17-133, depending on level of need	74
Percent additional for low-income students	26-33, depending on grade level (lower grades are higher)	12-48, depending on concentration of poverty	36-47, depending on concentration of poverty	97 (state guarantees 40)
Percent additional for below proficient readers		19 for 3rd graders reading below proficient, who do not receive additional funding through other allocations		
Percent additional state and local funds spent on students in the poorest quartile of schools than on students in the wealthiest quartile of schools (NCES, 2016)^a	7.3 rank 6	1.4 rank 22	7.3 rank 4	-4.9 rank 34
Percent additional state, local and federal funds spent on students in the poorest quartile of schools than on students in the wealthiest quartile of schools. (NCES, 2016)^a	14.8 rank 6	8.1 rank 22	16.1 rank 4	1.5 rank 41

Overall, the top international performers fund their education systems more equitably than any U.S. state, including Maryland. None of these jurisdictions rely primarily on property wealth of local areas to determine funding levels.

- Singapore is the most straightforward with the national ministry distributing equal funds to all schools on a per-student basis. They do not add student weights, except for special needs students. Instead they assign additional teachers and enrichment funding to all schools to flexibly address the needs of students who need extra help. Singapore's mixed-income housing policies result in local schools with mixed-income students and no concentrations of poverty in specific schools.
- Ontario collects local school taxes at the provincial level and then distributes funds equitably throughout the province with a formula that assigns more money for students who are more expensive to educate, including low-income students, students with single parents and students at-risk of not graduating from high school, as measured by not passing the 10th grade literacy exam.
- Finland uses a combination of funds from the national level and the local level to fund schools but redistributes local funds to ensure that all localities receive about the same amount. They add weighted funding for children whose parents have low education levels, used as a proxy for a wide range of disadvantages. Like Singapore,

they assign support teachers to every school to provide extra support to any student needing help in literacy or mathematics. Almost one-third of all students are supported at some point in their school career.

- Shanghai receives funds from the National Education Ministry for per-pupil expenses, but also sends funds back to the National Ministry to redistribute to less wealthy provinces across China. The province distributes per-pupil funding to supplement and equalize the funding that local districts raise themselves through taxes. They do not weight their formulas at this point except for a small special needs population of students. Instead, low-income students receive direct financial supports to cover food, transportation, fees and, at the secondary level, living stipends and tuition.

It is worth noting that special education, a large and growing cost for states in the US, is generally structured differently in many of the top-performing countries. The top performers tend to categorize a much lower percentage of students as "special needs", and mainstream all but those with the most significant physical and cognitive disabilities. For example, only 5 percent of students in Singapore are in special education. The exception is Finland where almost one-third of students received "special supports", but this is primarily done as extra help to small groups of students that occurs regularly through a student's career and, because almost all students receive this support at some point, there is no real stigma

attached. The growing percent of students labeled special education in the United States has been an issue for many states, and there is some evidence that there is an over-representation of low-income and minority children labeled special education. Top-performing international systems with an abundant supply of high quality teachers and a collaborative work organization that gives more time for teachers to work together and with students that need help keeps special education funding low and productivity high.

Access to high-quality teachers and extra academic support for at-risk students:

Maryland, like all other U.S. states, does not have specific policies to assign high-quality or additional teachers to high-need students or schools. The state does fund additional staff to support high-need populations through some specific federal funding (Title I funds for high-poverty schools) and some state programs like the Public Schools Opportunities Enhancement Program, which funds projects to extend the school day and school year in high-poverty schools. Maryland's 21st Century Learning Center programs also provide funding for afterschool educational support and enrichment activities for low-income schools, however, funding for these Centers may end if the Congress does not refund the

program as suggested in the federal government's proposed budget.

Maryland, like other states, has been required by the federal government to monitor its educator equity data since 2009. This data looks at whether at-risk students, including low-income students and minority students, have access to highly qualified teachers at the same rate at which other students in the state do. The federal government required states to compare the percent of students in the lowest-poverty quartile of schools (LPQ) and highest-poverty quartile of schools (HPQ) who had teachers who were inexperienced, rated less than effective on the state teacher evaluation system, were teaching out of their certified subject areas, were absent more than 10 days, and salary levels. Maryland's data from the 2015 state report and the updated data in their ESSA plan show clear patterns of inequity across the state. This is the case in the top-performing states as well, although Maryland's 2015 Equity Report showed bigger gaps in all areas except for teacher absenteeism than in the benchmark states. This was particularly true for the salary differential. Maryland's 2017 data in its ESSA plan, which focused on poor children in Title I schools rather than high and low poverty quartiles of school districts, in general showed slightly smaller gaps in access than seen in the benchmark states.

Chart 2: States' 2015 Equity Profiles⁸

	Percent of teachers in their first year of teaching		Percent of teachers without certification or licensure		Percent of classes taught by teachers who are not highly qualified		Percent of teachers absent more than 10 days		Adjusted average teacher salary	
	HPQ	LPQ	HPQ	LPQ	HPQ	LPQ	HPQ	LPQ	HPQ	LPQ
MA	7.8	4.4	3.3	3.7	4.5	.9	24.8	24.4	\$68,825	\$66,848
NH	4.2	2.8	2	0.5	1.6	2.1	34.5	26.9	\$49,479	\$48,998
NJ	5.8	5.2	0.8	0.9	0.3	0	30.3	18	\$63,343	\$65,710
MD	7.3	3.1	5.1	1.9	14.2	4.2	29.1	28.8	\$54,480	\$61,208

HPQ: High poverty quartile; LPQ: low poverty quartile

Chart 3: States' 2017 Equity Updates

	Gap between low-income students in Title I schools and non-low income students in non-Title I schools *		
	Percent taught by out-of-field teachers	Percent taught by ineffective teachers	Percent taught by inexperienced teachers
MA	8.8	4.3	5.3
NH	NA	NA	NA
NJ	8.5	8.4	0.24
MD	3.8	4.3	3.9

Maryland's 2015 Equity Plan identified a number of issues to account for the disproportionate numbers of challenged students assigned the least qualified teachers. Among the issues identified were: 1) a lack of control over the quality of the significant portion of their teaching force that is trained out-of-state (60 percent); 2) a high attrition rate among new teachers (10.8 percent within the first 5 years); 3) teaching shortages in certain subjects as key issues; and 4) shortages of highly qualified teachers in rural areas of the state.⁹ The plan to address these issues, updated in 2017 for ESSA, proposes to continue work to provide more and better access to highly qualified teachers across the state through the development of regional Teacher Learning Centers to support teacher

preparation and professional development. These Centers will be hubs to serve a variety of roles such as: provision of professional development, coordination of internships for teacher candidates regionally, sites to deliver alternative teacher preparation for the region designed to meet the needs of districts with shortages of teachers in particular subjects; and technology centers to offer long distance learning opportunities to teachers in rural areas of the state. In addition, the plan identified six school districts where inequities in educator access are highest and proposes the development of specific interventions there. The proposed strategies include: changing the Quality Teacher Incentive Act to expand incentives for teachers in these schools to get National Board for

Professional Teaching Standards certifications and a range of incentives to attract high quality teachers to schools with high-need populations such as housing incentives, job search assistance for spouses and loan forgiveness. The state is also considering a range of other strategies, including: more professional development (with stipends) targeted at teachers with less experience; adding requirements to teacher preparation programs to give students experience with diverse and high-need student populations; and allowing principals in low-performing schools first choice of new teacher applicants. In addition, the state is committed to collecting data on this issue annually and including information about educator equity in its annual state reports on education, including its statewide staffing report.

Maryland's strategies for addressing inequities build on similar strategies to those in the benchmark states, and the approach of working through new regional Teacher Learning Centers seems promising. Massachusetts is a state to look to for ideas about addressing these issues, as they have moved further along in implementation of the various parts of this agenda. In particular, their Elevate Preparation: Impact Children (EPIC) portfolio of initiatives to improve educator preparation has useful strategies, including funding a set of grants to districts to partner with the state in developing strategies to train more teachers in shortage subjects and improving teacher induction in high-poverty districts to reduce the attrition rate in those districts. In addition, Massachusetts has expanded its data collection on education equity to include access to high-quality school leaders as well as teachers and is also collecting data on English-language-learner

populations, as well as the federally-required populations of at-risk students and minority populations. Maryland might consider doing this as well.

All of the international top performers assign extra teachers to work with high-need students. Finland and Singapore assign all schools learning support teachers who work with small groups of students in classrooms to provide them with extra help to stay on-track in class. Ontario assigns literacy and numeracy support teachers to all schools, and additional teachers to secondary schools where there are high numbers of students at-risk of not graduating. These extra teachers work with students under the direction of the classroom teacher, with the aim of helping these students succeed in the specific work for that class. This is different than what is typically done in the United States where students are often pulled out of class to work with specialists once or twice a week, and most often using an "intervention" program that is not necessarily aligned with the classroom curriculum. Afterschool support is most often provided by paraprofessionals, again with little coordination with classroom work.

In addition to assigning more teachers to at-risk students, many of the top performers have explicit policies to ensure that these students are taught by the most qualified and /or highest-quality teachers. For example, both Singapore and Shanghai assign well-regarded teachers and school leaders to help low-performing schools and teachers. It is an expectation that many educators on higher levels of Shanghai's career ladder will teach for a time in lower-performing or rural schools, either as part of the Empowered Management Schools process that shares school staff collaboratively across

high- and low-performing schools, or as part of a temporary rotation into a low-performing school full time. It is very hard, if not impossible, for teachers to move up the career ladder in Singapore and Shanghai unless they have taught disadvantaged students. While Finland does not have a specific policy to assign high-quality teachers to high-need schools, there are financial incentives for teachers to work in rural and high-need schools. In addition, many teachers teach in rural areas initially, as jobs in the cities are more competitive. In effect, this helps to distribute high-quality teachers throughout the country. In addition to these specific policies, all of the top-performing jurisdictions have much higher entry standards for the profession, which ensures a higher quality bar for teachers across the system.

Recommendations for Maryland

Resources required to fund a Maryland education system that would be competitive in both student performance and equity with the best education systems in the world

There are two core issues here: First, how much money would be required to enable Maryland's students to achieve academic standards as high as the students in the countries with the world's most effective education systems, and, second, how should that money be distributed to schools and districts to provide as much equity as possible, or, put another way, to reduce the gap between the performance of the bottom quartile of students and the top quartile as much as the top-performing countries have.

Maryland already spends more than almost all the top-performing countries per student on its elementary and secondary schools. But this comparison

does not take into account the fact that income inequality in the United States is the highest in the industrialized world and the concentration of poverty is higher in the United States than in much of the industrialized world. These facts force the schools to use significant amounts of their funds to provide a wide range of services to low-income students that are either provided by other agencies of government or are not needed in the countries with the top-performing education systems. Because the available data does not make it possible to compare national or state budgets in these categories, it is impossible to say how, when the costs to the schools of inequality and concentrated poverty are taken into account, Maryland's costs of education compare to those in the top-performing countries, but the evidence we do have suggests that the costs when compared in that way would not be very different.

However, the evidence from the OECD data shows that, once a nation reaches a level of spending of \$50,000 per student over the period of that student's compulsory education, how the money is spent is more important than the amount that is spent in determining student achievement. Maryland is far beyond that point.

The study done for Maryland by APA hinges on the idea of adequacy and on research methods that APA used to determine how much money would be required to provide an education for Maryland students that would be adequate for reaching Maryland's goals. It drew on a number of methods for making these judgments. The first, used to determine how much money would be needed for the base, was determined by researching the actual costs in a panel of schools that were successful. The second, used to determine the

weights to provide additional funds to certain categories of vulnerable students, was determined by education experts. APA then suggested that these figures be corrected for certain factors, such differences in the cost of living between urban and rural areas.

These methods are widely used and have repeatedly stood up to court challenges. Similar methods were used to provide the rationale for the recommendations made by the Thornton Commission. The legislature used those recommendations as the basis for the legislation that currently determines school funding in Maryland, making adjustments to account for, among other things, the fact that individual students might reasonably be counted for more than one of the conditions for which weights were recommended.

While the legislature accepted the broad approach recommended by the Thornton Commission, the legislation it enacted departed from those recommendations in important ways and was further altered by subsequent legislatures. NCEE recommends that the Commission consider the following options:

1. Increase the special education weight, which is significantly lower than the weight assigned to special education students by other states with pupil weighted school finance systems.
2. Add additional funds for school districts with concentrated poverty; this could be done by altering the formula for this purpose or, like many top-performing countries, by allocating additional teachers to schools serving low-income students

with an increasing ratio for schools in areas of concentrated poverty.

3. Change the way local wealth is calculated for the purpose of determining the local contribution by rewarding districts for making a larger than average tax effort with more state aid. This is now done with the guaranteed tax base system, but the level of aid provided in this way should be raised to create a fairer system.
4. Require local systems to fund their fair share of the at-risk pool.
5. Eliminate the feature of the formula that adjusts the state contribution on the basis of cost of living. This feature makes it more difficult for rural school districts to attract teachers for the same reasons that it makes it harder for rural communities to attract doctors to rural areas.
6. Focus special education funding on students who have specific cognitive or physical impairments, staying within the requirements of IDEA. There is a good deal of evidence that students who do not have such impairments but are labeled as special education students are more harmed by the label than helped by the additional resources.

At a subsequent meeting, there will be a full discussion with the Commission of the recommendations and financial implications to enable at-risk students to achieve high standards that the Commission has already discussed. Among items on that agenda will be:

1. Expanding and intensifying early childhood education and care.
2. Providing more high quality teachers to high-need schools.

3. Providing incentives to teachers to teach in high-need and rural schools including pay bonuses and advancement on a career ladder for successful service.
 4. Providing tuition grants to top-achieving students who commit to teaching in high-need or rural schools.
 5. Creating a system for teachers and school leaders from successful schools to work in partnership with high-need schools.
 6. Allocating additional teachers and other resources to schools using the results from an early warning system that identifies students that are not on track. While Maryland has various policies in place to offer support to students, the state should rethink its policies for struggling students to ensure that the support is explicitly linked to classroom instruction, is provided as soon as students need it and is delivered by high quality teachers.
 7. Reorganize work organization in schools to allow for more time for teachers to work with struggling students.
 8. Support community schools that provide services and programs for at-risk students and families.
- Also at a subsequent meeting, the Commission will have to decide what recommendations to make on the base funding and what the state should do about the reform agenda they recommend.

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BUILDING BLOCKS

3 & 4:



INSTRUCTIONAL SYSTEMS AND GATEWAYS

Summary

This gap analysis focuses on instructional systems and gateways and summarizes what the top-performing benchmark jurisdictions and Maryland do in terms of:

- standards and whether they are benchmarked;
- curriculum and assessment and whether they are aligned;
- the format of assessments, including whether they are writing-, problem- and project-focused and whether scoring is transparent; and
- the exit requirements for high school, whether they align with the entry requirements for postsecondary, and whether these are what is needed to be successful.

We start with a set of key takeaways for each of these areas and then we present a set of preliminary recommendations for the Commission to consider.

How Does Maryland Compare?

Standards

- The international top performers include common standards for all core subjects. Maryland has common standards in the core subjects as well. Maryland, like the other states benchmarked, has a set of state standards that incorporate the Common Core State Standards (CCSS) in English and mathematics and the Next Generation Science Standards (NGSS), and also include state-specific content standards in the areas of fine arts, social studies, health, world languages, instruction for English language learners, school library media, financial literacy, environmental education,

technology education, and physical education. Top performers Singapore and Ontario have also developed standards for electives and co-curricular courses such as enterprise development, design, robotics, and others, which Maryland has not done. Maryland, unlike any of the benchmark states, has Pre-K standards that are aligned with its state College and Career-Ready Standards.

- The CCSS were developed after a review of standards in a number of countries, including Finland, Canada, Singapore, the United Kingdom, Australia, New Zealand and Ireland. After the standards were developed, the nonprofit Achieve, one of the lead partner organizations in the development of the standards, benchmarked the mathematics standards against those in Singapore and Japan and the English Language Arts standards against those in Alberta, Canada and New South Wales, Australia. In 2010, Achieve benchmarked the science standards in 10 jurisdictions: Ontario, Taiwan, the U.K., Finland, Hong Kong, Hungary, Ireland, Japan, Singapore and South Korea. The NGSS were developed based on that analysis. Maryland's state standards in other subjects show no evidence of international benchmarking.

Curriculum

- The international top performers provide curriculum frameworks, syllabi and sample lesson plans to all teachers jurisdiction-wide. (The one exception is Finland, where the work of interpreting the national curriculum framework is left to teachers.) In Shanghai, Singapore and Ontario, teachers work together

in teams to adapt lesson plans to meet their needs and refine their lessons, and tools and videos of exemplary lessons are available on online portals.

- Maryland provides this level of support to teachers in reading and mathematics, for the most part. Online curriculum toolkits include lesson frameworks, aligned to the standards, and organized into 4-6 units of study for each grade level. In each unit of study, there are some fully developed lessons and 10-30 “lesson seeds,” each seed designed to guide one day of instruction. Each seed was developed by a working group of Maryland teachers. The lesson seeds are not designed to be complete lesson plans for each day, but rather to provide suggestions of the objectives the teachers should hit, the activities they may wish to plan and the texts they may want to use. Some include the guiding questions teachers may want to ask as well, although not all do, as the level of detail in each seed is somewhat inconsistent from grade level to grade level. The seeds encourage teachers to build in formative assessment to their lessons but do not provide examples. There are video exemplars on the website for lessons emphasizing close reading and writing, which are addressed in the lessons and seeds, but not for other subjects. At this time, Maryland does not have a process for determining how teachers are using the materials. However, the lessons and seeds are revised on an ongoing basis by curriculum experts and teachers.
- These lesson seeds are only available in English and mathematics. In science and social studies, the state

provides a list of student learning objectives that align to specific standards, so teachers can plan a set of lessons themselves around those objectives. Other subjects have no statewide planning resources other than the standards.

Assessment

- In Singapore, Shanghai and Finland, students have to pass exams in a range of subjects, outlined in the table below, in order to earn a qualification to move on to the next level of education, whether academic or technical. Students in Maryland must pass exams in English, mathematics, science, and American Government to graduate from high school. (Note: The consequences for some of these exams have been temporarily suspended as new exams have been rolled out. The class of 2019 will have to pass all of them.) In Ontario, students must only pass a literacy examination. In Massachusetts, students must pass mathematics, English and one science exam of students’ choice. In New Jersey, students must pass examinations in English and mathematics. In New Hampshire, no exams are required.
- Maryland, like New Jersey, uses PARCC for its statewide assessment in English and mathematics, including its required exams for high school graduation. Massachusetts uses its own exams, the MCAS, in English and mathematics as well as the sciences, which is similar to PARCC in English and mathematics and uses some of its items. New Hampshire uses SBAC, which covers English and mathematics.
- In the international jurisdictions benchmarked, exams at the

secondary level use multiple types of questions with an emphasis on essay and problem-based questions that require students to complete extended tasks. This is not to say these jurisdictions do not include multiple-choice or open-ended short answer questions on their exams, but there are fewer of them and they are weighted less. The chart on the next page estimates the breakdown of test items by calculating what percentage of a student's score on the exam is made up of essay or extended task items compared to the percentage of a student's score made up of selected-response items like multiple-choice or matching.

- There are more multiple-choice questions on PARCC than in the exams administered in Finland and Singapore, and in Shanghai's *zhongkao*. PARCC English 10 has slightly fewer multiple-choice questions, and more writing, than Ontario's literacy exam and MCAS English 10. However, PARCC Algebra 1 has fewer constructed-response questions, and more multiple-choice, than MCAS Math 10.
- Ontario, Singapore and Shanghai make public student work on the exams that meet standards or receive certain grades with commentary explaining why the student's work received those grades. This allows for transparency about what is expected and at what level for all involved in the learning process. Prior-year tests are also made public in these jurisdictions. This is done for all grades and subjects in Singapore and Shanghai; in Ontario, it is done for the sole high-stakes test: the 10th grade literacy test. Finland releases past exams in full, but not examples of student work.
- PARCC provides sample test items and practice tests for all grades on its website. This includes sample student responses that meet the criteria for the best marks on the constructed response questions in both mathematics and English Language Arts. What is included in these examples is sometimes inconsistent: some grade levels include commentary from graders on why the response meets the standard it does; others omit this commentary. Still, when commentary is included, this practice is comparable to top performers Ontario, Singapore, and Shanghai, which release exams in full, with full answers and explanations of why student work meets the standards.
- MISA, the new, NGSS-aligned statewide Maryland test in science, which will be rolled out in high school starting in 2018, is organized into four "units". In three of the units, students read short passages and answer one constructed-response question, and a set of other questions that includes multiple choice, fill-in-the-blank, matching and other "technology-enabled" formats. In the fourth unit, students must complete an extended task involving a simulation and extended writing.
- The Maryland High School Assessment in Government, required for graduation, includes selected response, brief constructed response and long-form essay questions.

- In Maryland, 2017 legislation (SB 0452) prohibits allowing mandated assessment to exceed 2.2% of the

minimum required instructional time.

Chart 1: Assessments Needed to Receive Qualification or to Graduate from HS

Note: the breakdown of test items listed below are estimates. They are calculated by looking at what percentage of the total number of points available each type of test item is worth. This chart is intended to show the balance of long-form essay and extended-task items to shorter items that require less critical thinking and sustained effort. Therefore, we have combined several types of constructed-response items, where appropriate, and done the same for selected response items.

Jurisdiction	Exams Needed for Qualification	Breakdown of Test Items
Finland	Matriculation exam (end of secondary, four subjects of students' choice)	100 percent constructed response and long-form essay, except in foreign language exams, which are 40 percent multiple choice
Ontario	Ontario Secondary School Literacy Test (grade 10)	25 percent long form; 25 percent short answer; 50 percent multiple choice
Shanghai	Lower secondary exit exam (<i>zhongkao</i>) (Includes Chinese, mathematics, English, physics, chemistry, politics, and physical education)	50 percent long-form; 30 percent constructed response (fill-in-the-blank); 20 percent multiple choice There is also a separate physical education exam involving physical tasks (e.g., timed running).
	Upper secondary exit exam (<i>gaokao</i>) (Includes Chinese, mathematics, a foreign language, a "comprehensive ability test" emphasizing content across the curriculum, and one additional subject of student's choice)	TBD – format being restructured
Singapore	Primary School Leaving Exam – English	27.5 percent long-form essay; 47.5 percent short-form constructed response; 10 percent multiple choice; 15 percent speaking
	Primary School Leaving Exam – Mathematics	80 percent long answer and tasks; 20 percent multiple choice
	Primary School Leaving Exam – Science	44 percent constructed response; 56 percent multiple choice
	Primary School Leaving Exam – Mother Tongue	50 percent constructed response; 15 percent speaking; 35 percent multiple choice

Jurisdiction	Exams Needed for Qualification	Breakdown of Test Items
	O-, N- and A-levels (in subjects and at levels of the students' choice, depending on pathways and interests; subjects may include mathematics, English literature, physics, biology, chemistry, geography, history, classical and modern languages and many others.)	100 percent long-form essay and tasks, except in the case of foreign language exams (approximately 10 percent of those exams only are multiple-choice)
MA	MCAS English 10 (Next-Gen MCAS in 2019)	28 percent long-form essay; 22 percent short constructed response; 50 percent multiple choice
	MCAS Math 10 (Next-Gen MCAS in 2019)	40 percent tasks and constructed response; 7 percent short answer; 53 percent multiple choice
	MCAS Science and Technology / Engineering (Next-Gen MCAS in 2019)	33 percent constructed response; 67 percent multiple choice
NH	None	N/A
NJ	PARCC English 10	Breakdown of test items varies slightly by grade level: Between 37-40 percent constructed response; Between 60-63 percent selected response
	PARCC Algebra 1	25 percent tasks and constructed response; 75 percent selected response
MD	PARCC English 10	Breakdown of test items varies slightly by grade level: Between 37-40 percent constructed response; Between 60-63 percent selected response
	PARCC Algebra 1	40 percent tasks and constructed response; 60 percent selected response
	MSHA Government	76 percent multiple-choice; 24 percent constructed response including brief constructed response and long form essay questions.
	MISA Science	15 percent short constructed response; 75 percent selected response (multiple choice, matching, etc.); 10 percent extended task with simulation

Gateways to College and Career Readiness

- Students in the international jurisdictions studied move through elementary and lower secondary school in a common program of study that covers the core subjects in the curriculum. At the age of about 15 or what is considered grade 10 in the United States, students take exams that determine if they receive a qualification that, depending on their exam scores, gives them the option to attend an academic upper-secondary program, a technical upper-secondary program or, in some cases, a program that combines theoretical and hands-on learning. Exams are also taken at the end of high school leading to university entrance or technical post-secondary education (such as the Institute of Technical Education or Polytechnic in Singapore or an Institute of Applied Science in Switzerland.) Exams in both cases cover multiple subjects in the curriculum. Movement between types of institutions is an option and does occur.
- Furthermore, some of the top performers build in early checkpoints to monitor whether students are on track to meet these demanding standards. In Singapore, students' performance on the Primary School Leaving Exam and their grades in the first year of lower secondary (grade 8) are used, in part, to determine, what courses they take at an advanced level and what courses they take that offer more targeted support. Nevertheless, all students have the opportunity to go on to higher education. This strategy has led to strong results. In Singapore, the students in the bottom quartile perform at higher

levels in mathematics than the average U.S. student according to PISA scores. In Ontario, teachers are trained in how to develop summative assessments that measure whether students are on track to pass the Secondary School Literacy Test. School-based Student Achievement Officers (SAOs) provide coaching for teachers in how to provide targeted support to students who are behind and design programming to help them reach the standard they will need to meet for graduation.

- At this time, Maryland is relying on its Kindergarten Readiness Assessment and on PARCC tests to diagnose whether students are falling behind grade-level expectations. Maryland's Kindergarten Readiness Assessment (KRA) provides data on student preparedness for kindergarten. The KRA is now only implemented on a sampling basis in more than half of the local school systems. It will provide system and state-level data but not student-level data as it was intended. PARCC is administered in grades 3-8, and these scores provide students scoring below grade level with an opportunity to work towards grade-level expectations with additional instructional support. However, the state does not have a statewide early warning system for the express purpose of identifying students who are far behind grade level by the time they enter high school and intervening when necessary. The state did have such a system statewide in the 1980s (Maryland's Tomorrow) but it abandoned this with the loss of federal funding. Montgomery County Public Schools has a pilot program in place with intervention

schools that target additional tutoring and supports to students at risk of dropping out.

- The U.S. states we studied, except for New Hampshire, use examinations to determine whether students are ready to graduate from high school, but in Maryland and elsewhere, these examinations are not the same as those that determine college readiness or are used to help students choose from among different pathways.
- The achievement level of students at the end of what the United States calls grade 10 or at about age 15 in top-performing countries far exceeds students in most U.S. states. Massachusetts comes the closest to international top performers on PISA in mathematics (ranked 21st out of 71), reading (ranked 2nd out of 71, after only Singapore), and science (ranked 6th out of 71). This suggests that if Maryland wants its students to be able to compete on an international stage, ensuring that all Maryland students have the opportunity to master the core subjects in the curriculum at a world-class level prior to leaving high school is essential.
- Over the last decade, Maryland has been discussing college and career readiness extensively. These discussions led to the passage of SB740, the College and Career Readiness and College Completion Act, in 2013. This act lays out a set of exams that students should pass in order to determine if they are college and career ready (CCR), and requires rising high school seniors who are not on track to readiness to participate in a "transition year" of remedial coursework designed to get them ready. Each of these

requirements is described in more detail below. Although several states, including benchmark state Massachusetts, have begun to require passing exams in order to graduate high school, no state that we know of has built out a system of supports for students who are not CCR as strong as the transition year program in Maryland. Therefore, this legislation puts Maryland in a strong position relative to many states and is a strategy that Maryland can build on moving forward.

- The legislation also creates some confusion regarding the standard that high school students should aspire to meet. Specifically, it means that Maryland currently has three separate measures of students' success in high school and readiness for higher education in place, all of which are unaligned with each other: 1) a set of high school graduation requirements; 2) measures of college and career readiness (CCR) in English and math as a result of SB 740; and 3) a set of high school course completion requirements required for acceptance to the selective schools in the University of Maryland system (UMD). The high school graduation requirements determine whether students can exit high school. The CCR requirements were set by state legislation to determine whether students are ready to enter community college without having to take remedial courses. The UMD requirements are used as standards for admission to the state's selective four-year college system, and were set because UMD believes this coursework, at a minimum, is necessary for success in UMD first-year coursework. All of these requirements are laid out in

detail in the charts below. As the charts show, none of these requirements are aligned with each other, nor are they intended to be.

- The high school graduation and CCR requirements are not the same. CCR is focused exclusively on mathematics and literacy, whereas the HS graduation requirements are broader and include course requirements and assessments in social studies and Science. Students can graduate from high school without being college and career ready, because the Algebra II and English 11 PARCC exams are not required to graduate, and to be college and career ready, students must obtain at least a 4 on both of these exams. Furthermore, MSDE's guidance to school systems on what satisfies the CCR requirements differs from what the community colleges are accepting. In MSDE's advice to schools (the Tool Kit to Determine Students College and Career Ready), they identify obtaining at least a 4 on PARCC English 10 and PARCC Geometry as meeting CCR, while community colleges do not accept these test scores for CCR and require Algebra II and English 11. There is a current MOU between the State Department of Education and the community college system that ended on June 30 2017, which provides a good opportunity to revisit this issue. Currently students can graduate from high school by meeting the graduation requirements, while still not meeting the college and career readiness requirements. PARCC cut scores on the Algebra I and English 10 exams needed for graduation are being phased incrementally to reach the same cut scores as are used in the CCR standards by 2019 – 2020.

Neither set of requirements is fully aligned with the UMD admissions requirements, which are a set of course requirements in additional subjects.

- If students do not currently meet the CCR requirements by the end of grade 11, they are required to enroll in “transition courses” (a form of remedial education) in grade 12. After completing the transition courses, they are given another chance to pass the required PARCC exams. If they do not pass a second time, they can take an alternative summative transition assessment articulated with a local community college or a CTE Skills Standards summative assessment. They do not have to pass these to graduate. The incentive for establishing college and career readiness is that students who are certified as CCR do not have to take remedial courses entering community college for math and /or English. CCR is recorded on the students' transcript and this allows the student to share the designation with the college when applying. MSDE now has a signed MOU indicating that students with CCR designation are guaranteed to be able to enroll in the community colleges in Maryland without being placed in remedial math and /or English.
- For students who fail the exams required for high school graduation twice, the Bridge Plan is an alternative assessment that students can use to graduate. To qualify for the Bridge Plan, students must show evidence that they are on track to meet the course requirements for graduation, even though they have not met the assessment requirements. Students who qualify

are assigned project modules to complete. Local school systems establish a Local Review Panel to assess the modules based on state

standards and rubrics. These panels must include staff trained by MSDE to ensure consistency and standardization.

Chart 2: Maryland High School Graduation Requirements for the Class of 2018 (the Standard for Entrance to Community College)* Compared to University of Maryland Entrance Requirements

HS Graduation Requirements: Courses	HS Graduation Requirements: Assessment	University of Maryland System Entrance Requirements
<ul style="list-style-type: none"> 4 English credits 3 Math credits (including Algebra 1 and Geometry); students must take 4 years of math if they stay in high school for 4 years 3 Science credits (including Biology and 2 additional lab courses) 3 Social Studies credits (including U.S. history; local, state and national government; world history) 1 Fine Arts credit ½ Physical Education credit ½ Health credit 1 Technology education credit 2 credits of World Language OR 2 credits of Advanced Technology or successful completion of a state-approved career and technology program. 1-3 electives <p>21 total credits (credit = a course)</p>	<p>PARCC:</p> <ul style="list-style-type: none"> Algebra 1 (participation only, no cut score needed this year) English 10 (participation only, no cut score needed this year) <p>Maryland State Assessments (MSA):</p> <ul style="list-style-type: none"> Biology (Cut Score 394) (Transitioning to Maryland Integrated Science Assessment (MISA) in 2018) American Government (Cut Score 394) <p>Students who fail these assessments twice may take Bridge Plan project-based assessments.</p>	<ul style="list-style-type: none"> 4 English credits 4 Math credits (including Algebra 1, Algebra 2 and Geometry) 3 Science credits (including 2 different areas and 2 lab courses) 3 years of history or social science 2 years of foreign language Avg. SAT of admitted freshmen in 2016: 1340 Avg. composite ACT of admitted freshmen in 2016: 30

* A high school diploma is required to enter community college in Maryland. But students must meet the CCR requirements in order to be sure that they will not require remediation in community college

- Although the CCR requirements are a more rigorous standard to meet than the graduation requirements, there is mixed empirical evidence as to whether all of the options actually signal that students are ready to

succeed in two-year college credit-bearing courses. The CCR requirements, and the evidence for whether they actually correlate with success, are summarized below.

Chart 3: Maryland College & Career Readiness Assessment
Requirements for the Class of 2018

(Students must meet one of the following in both Math and English):

	Math	English	Correlation with Success
PARCC	4 or 5 on Algebra II	4 or 5 on English 11	Preliminary studies, not yet validated with a full cohort of students, indicate that a 4 on English 11 and on Algebra 2 means that students have a 75% chance to score a C or better on first-year credit-bearing courses at either 2- or 4-year colleges.
SAT	500+ Mathematics	500+ on Evidence-Based Reading and Writing section	These scores represent a 75% likelihood of a student achieving at least a C grade in a first-semester, credit-bearing college course in a related subject. Both 2- and 4-year colleges were included in studies validating this.
ACT	21+ Mathematics	21+ composite/average of English and Reading	These scores represent the level of achievement required for students to have a 50% chance of obtaining a B or higher or about a 75% chance of obtaining a C or higher in corresponding credit-bearing first-year college courses. Both 2- and 4-year colleges were included in studies validating this.
AP	3+ on AP Calculus AB, AP Calculus BC, or AP Statistics	3+ on AP Language and Composition or AP Literature and Composition	In studies of students at 4-year colleges and universities, a 3 or higher on the AP final exam is positively correlated with college enrollment and persistence rates. AP courses are designed to prepare students for post-secondary, not give them post-secondary credit, but many institutions grant credit for AP courses.
Dual enrollment	In an approved Math course at a college	In an approved English course at a college	N/A
Accuplacer	45+ on College Level Mathematics	79+ Reading; 90+ Sentence Skills and 6+ Writing	Scores set by Maryland based on analysis of the test and community college curriculum and validated by empirical studies of student grades in credit-bearing courses correlated to different Accuplacer scores. Scores are reviewed every 5-7 years.
IB	4+ on Mathematics	4+ on Language or Language and Literature	The IB is designed to prepare students for post-secondary, not give them post-secondary credit, but many institutions grant credit for IB diplomas. There are validation studies for this practice. Studies found a positive association between higher marks on IB exams and higher grades in first-year coursework. These studies looked at not only academic grades but also ability to manage coursework, problem solve and other "dispositions." Specifically, a 4 or higher on the IB final exam is positively correlated with college enrollment and persistence rates. These studies are all at 4 year institutions.

Students taking the 12th grade Transition Course (those not designated CCR by the end of 11th grade) may take one of the following alternative options listed below. To the best of our knowledge, these have not been validated or

correlated with success in a 2-year institution, although a study of this has been proposed: Phase II of the PARCC Performance Level Setting Longitudinal Validation Study, which is currently under discussion.

Chart 4: Alternative Options for MD High School Graduation Assessments

	Math	English
CTE Technical Skills Attainment	State-approved CTE program and qualifies for TSA Early College Credit or qualifies for an MSDE industry-recognized credential	State-approved CTE program and qualifies for TSA Early College Credit or qualifies for an MSDE industry-recognized credential
Summative Assessments	Summative assessment aligned to the Math Transition course articulated with a college	Summative assessment aligned to the ELA Transition course articulated with a college

To sum up this section, Maryland has put in place multiple measures that attest that students are college and career ready. Those measures are not aligned with each other and in some cases, are very different from each other. As the chart below shows, differences between CCR and graduation requirements persist through 2020. It is our view that Maryland needs to make the standard for exiting high school and the standard for entering 2-year post-secondary institutions without remediation the same. Whatever the state decides to do, it needs to be clear with students, parents and the public about what standards for readiness are intended to prepare students for and what is required to meet them. Current definitions and goals are difficult to interpret.

There are already changes being made nationally and in Maryland about the definition of college and career readiness, and the sequence of high school courses that this would require. For example, the College Board, the organization that owns the most used college placement test in

Maryland, has revamped its Accuplacer test and released "Next Generation" reading, writing and mathematics tests. For mathematics, the Elementary Algebra and College Level Math tests are being replaced by Quantitative Reasoning, Algebra and Statistics (QAS) and Advanced Algebra and Functions (AAF) tests. The College Board is currently doing correlation studies of the "classic" and the "next-generation" tests, but the new tests are now available. Maryland will have to decide whether it plans to use the new Accuplacer and, if so, which Accuplacer mathematics test to use for placement into credit courses in two- and four-year colleges. Currently, one test option in Maryland students have to meet CCR in high school is Accuplacer's College Level Math test so this decision will impact those students.

Maryland is currently investigating just that issue with its First in the World Maryland Mathematics Reform Initiative, which is piloting a statistics course for non-STEM developmental math students rather than the traditional developmental algebra

course at two- and four- year colleges across the state. The results of this pilot can help guide the decisions that both the K-12 and post-secondary system will be making. In addition, colleges across the country and in Maryland are starting to use "multiple measures" approaches to course placement, relying

on high school grades and GPA in their determinations of placement in addition to scores on placement tests. While this is not statewide policy, several colleges including Anne Arundel Community College and Howard County Community College are implementing this approach.

Chart 5: 2020 High School Graduation Requirements Compared to CCR Requirements and UMD System Entrance Requirements

High School Graduation Requirements for the Class of 2020	College and Career Readiness PARCC Requirements for the Class of 2020	University of Maryland System Entrance Requirements
<p>PARCC English 10 (Score of 4 or 5)</p> <p>PARCC Algebra 1 (Score of 4 or 5 if taken in high school; if taken earlier, no score required)</p> <p>Maryland State Assessments (MSA):</p> <ul style="list-style-type: none"> Biology (Cut Score 394) American Government (Cut Score 394)* *Transitioning to Maryland Integrated Science Assessment (MISA) in 2018 4 English credits 3 Math credits (including Algebra 1 and Geometry) 3 Science credits (including Biology and 2 additional lab courses) 3 Social Studies credits (including U.S. history; local, state and national government; world history) 1 Fine Arts credit ½ Physical Education credit ½ Health credit 1 Technology education credit 2 credits of World Language OR 2 credits of Advanced Technology or successful completion of a state-approved career and technology program. 1-3 electives <p>21 total credits (Credit = a course)</p>	<p>PARCC English 11 – Score of 4 or 5</p> <p>PARCC Algebra II – Score of 4 or 5</p> <p>Many assessment alternatives may be substituted for PARCC as described above.</p>	<p>4 English credits</p> <p>4 Math credits (including Algebra 1, Algebra 2 and Geometry)</p> <p>3 Science credits (including 2 different areas and 2 lab courses)</p> <p>3 years of history or social science</p> <p>2 years of foreign language</p> <p>Avg. SAT of admitted freshmen in 2016: 1340</p> <p>Avg. composite ACT of admitted freshmen in 2016: 30</p>

Recommendations for Maryland

1. PARCC offers more next-generation assessment items, like long essays and constructed response math problems that require students to justify their answers, than SBAC and the previous generation of American

assessments. But top performers Finland, Singapore, and Shanghai use even more of these items. Furthermore, PARCC's sustainability is uncertain. Maryland should begin planning now for the next generation of assessments that measure the knowledge and skills

needed in a global economy. Maryland might consider establishing a consortium of states that can begin thinking about what form future assessments should take, and how to begin developing them, including assessments in additional core subjects and that use essay, problem and project-based methods, with the knowledge mandated assessment cannot exceed 2.2% of the minimum required instructional time.

2. Maryland's lesson plans and lesson seeds in English and mathematics are a great start to help teachers build out course syllabi and lesson plans in a way that is aligned to the Maryland Standards. However, the amount of detail that is included in them is inconsistent. Strong teachers could help the state in reviewing all lesson seeds to ensure that they include, at a minimum:
 - Suggested objectives students should meet
 - Suggested texts to accompany a lesson
 - Suggested activities to use
 - Suggested guiding questions to ask
 - Suggested forms of formative assessment
 - Videos of successful lessons

In the top-performing international jurisdictions, developing a system of quality assurance for standards-based curriculum materials is a major initiative that includes teachers, school leaders, and district and jurisdiction-level officials. We know that Maryland is interested in building these materials as described above, and we urge them to do so.

3. Build out lesson seeds for subjects beyond reading and math, starting with science and social studies,

where the state has already developed some guidance, and then proceeding to additional subjects. As the state did with reading and math, have strong teachers lead the development of these seeds. Ensure that seeds in all subjects are comparable to those in reading and math and meet the core components listed above.

4. As they stand, the requirements for high school graduation do not ensure that students are ready for two- and four-year college without remediation. High school graduation and CCR requirements are not the same through the class of 2020. We suggest that Maryland reviews their current goals to determine if they want to continue down this path.
5. In deciding how to answer the question above, the state should ask itself:
 - Does the state want to make it possible to meet all graduation requirements within the first two years of high school so that students can pursue AP, IB, dual-enrollment and career pathway options in 11th and 12th grade?
 - If so, is the English 11 requirement for CCR creating an unnecessary barrier for students who wish to be college and career ready by the end of grade 10 so that they can pursue these options?
 - In the same vein, is the Algebra 2 requirement creating an unnecessary barrier for students?
 - Why is Algebra 2 a requirement for college and career readiness and UMD enrollment, given that research shows it is not needed for success in the majority of college courses?¹

- Because the CTE assessment is an option for students who repeatedly fail PARCC, does this mean that CTE students are not held to the same level of academic rigor as those who pass PARCC? Are the level and scope of CTE assessments comparable to the level and skills measured by PARCC? If not, should they be?
- 6. Establish data systems to track how students do in postsecondary education and answer questions such as:
 - How do students who completed the Bridge Plan alternative assessment do in postsecondary compared to those who completed PARCC?
 - What about those who take Algebra I and not Algebra II?
 - Are certain coursework choices more predictive of whether students progress and graduate?
 - Do students who meet standards with the Accuplacer cut score really demonstrate readiness?
- 7. The state is currently relying on PARCC 6-8 assessments to provide data on whether students are on track for college and career readiness. But it is not clear to us if this data is sufficient as an early warning system, nor is it clear what level of support students at-risk of not being ready for high school assessments or dropping out receive prior to grade 12. Build on the Bridge Plan and transition course

model, as well as the intervention schools in place in Montgomery County, to establish interventions for struggling students earlier than the 12th grade. For students that are substantially behind, provide a common curriculum that is designed to help them catch up with extra support for teachers and students including syllabi, lesson plans, formative assessments, and specified materials.

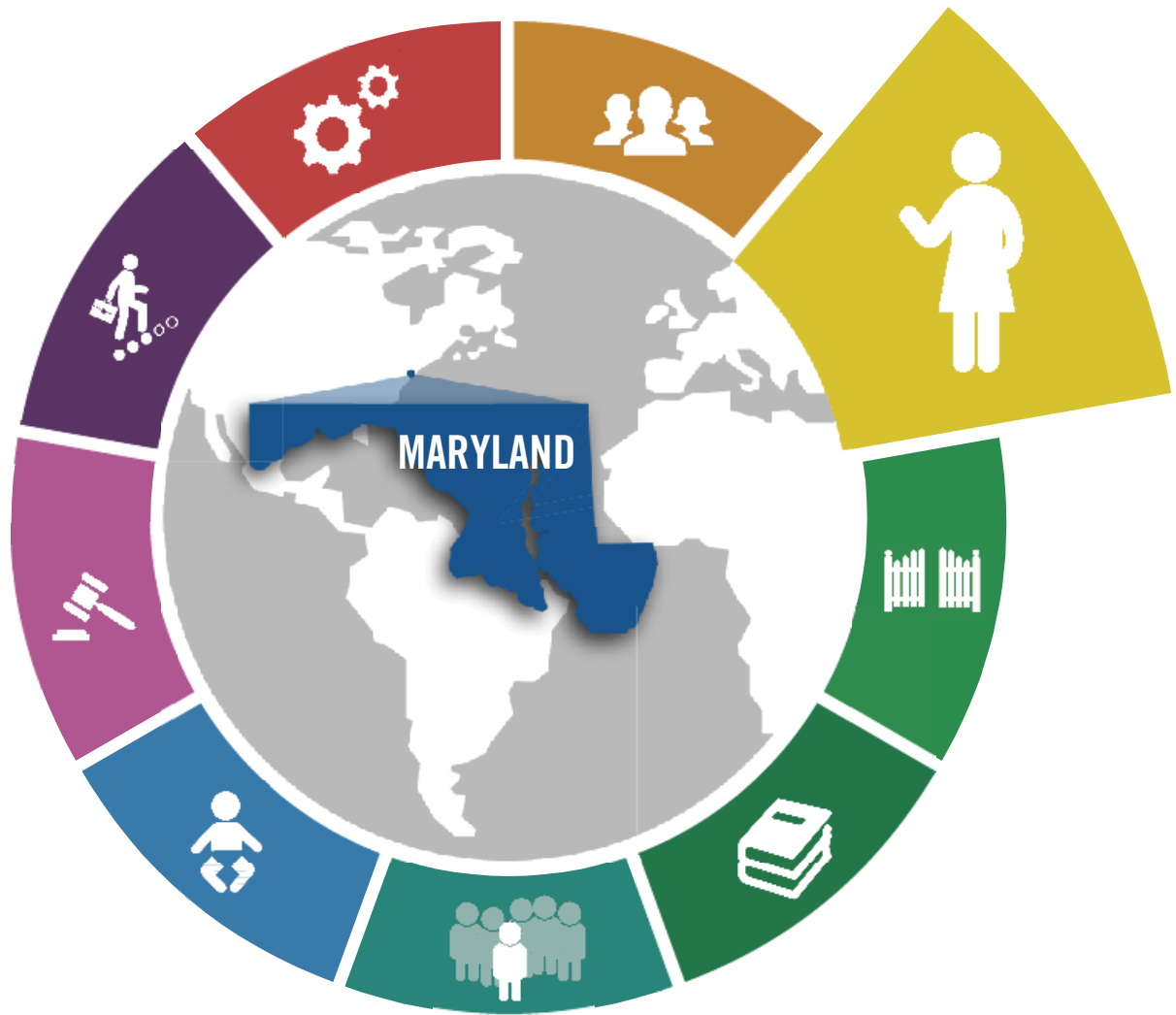
- 8. Target more teachers and resource personnel to the students at-risk of failure, as is done in Ontario.

All of the above recommendations will move Maryland much closer to the achievement level of the top-performing countries. But to match, or even surpass those countries, Maryland may want to consider the following steps:

- Conduct an empirical study of the actual requirements for being successful in the first-year of Maryland's community colleges and 4-year open-admissions institutions (state colleges).
- Compare where Maryland's students are relative to international top performers by administering PISA for Schools.
- With the last two steps complete, construct an even higher standard for CCR that is more competitive with standards in top-performing countries and consistent for exiting high school and being successful in college.

See National Center on Education and the Economy (2013). What Does It Mean to be College and Work Ready?: The Mathematics Required of First-Year Community College Students. http://ncee.org/wp-content/uploads/2013/05/NCEE_MathReport_May20131.pdf

BUILDING BLOCK 5



ASSURE AN ABUNDANT SUPPLY OF HIGHLY QUALIFIED
TEACHERS WITH THE NECESSARY DISPOSITIONS, KNOWLEDGE
AND SKILLS

The Benchmark

Top-performing systems believe it will be impossible to deliver to all their students the kind and quality of education formerly reserved for their elites unless they are able to put a highly skilled teacher in front of all their students. These teachers must possess strong enthusiasm for teaching; the ability to connect with students; mastery of the subject matter they will teach, including the conceptual underpinnings of the subject and how to teach that subject effectively; and the ability to conduct research to design new strategies, monitor their own effectiveness, and continually improve their craft.

In order to ensure that all teachers in a system are highly skilled, and that qualification systems prepare teachers who can do what is described above, top-performing systems put policies in place to:

- Ensure a high quality of pool of aspirants for admittance to schools of education;
- Ensure that their teacher preparation educates teachers so that they have a sound understanding of the content and structure of the subjects they will teach, and the craft of teaching those subjects; and,
- Ensure that all teachers exit preparation and enter their professions having met the same high standards for preparation.

Note that although this building block focuses on the policies for preparing teachers before they enter the classroom, top performers think of teacher development as a continuum that spans a teacher's entire career. This continuum also includes induction systems for pairing new teachers with trained

mentors who can support them as they begin their careers, a system of ongoing professional learning that gives teachers the time and space to collaborate with their peers and incentives for teachers to get better and better at their work. Because these elements of the continuum focus on what teachers do when they are on the job in schools, they are covered in *Building Block 6: Redesign Schools to be Places in which Teachers Will Be Treated as Professionals, With Incentives and Support to Continuously Improve Their Performance and the Performance of Their Students*. The remainder of this building block focuses on what the top performers do in preservice preparation.

International Top Performers

Ensure a High-Quality of Pool Selected for Teacher Preparation

High-performing systems ensure that only candidates who have the right qualities to be effective teachers are admitted to teacher preparation programs. They also ensure that they prepare the number of teachers that will actually be needed in any given year, instead of taking everyone who applies. In this way, they do not waste resources by preparing candidates in fields that are not needed, who are unable to handle the rigors of teaching, or who will be unable to find a teaching position. In the international systems we surveyed, policies to accomplish these goals took three forms. First, they have policies and data systems for ensuring that the number of candidates in teacher preparation is aligned with the number of new educators needed each year. These limits on the number of seats available allow top-performing systems to implement the second and third strategies: rigorous recruitment processes where teacher education providers consider only the most academically qualified candidates; and

screening processes, such as interviews or exams, for selecting only those with the skills and dispositions needed to be excellent teachers.

The specifics of these policies vary from country to country. In Finland, every two years, the Ministry of Education collects data on the total number of teachers that will be needed nationally, regionally, and in specialty areas, and adjusts the seats available in teacher preparation in response to these data. Applicants to teacher preparation are recruited mainly from the top quartile of their college-going high school cohort. Applying to teacher preparation involves taking a rigorous exam, the *Vakava*, that measures ability to think critically and evaluate and apply research on teaching, as well as additional aptitude tests, which assess the ability of candidates to evaluate teaching scenarios, display critical thinking and write well, as well as their passion for teaching, connection to children and the ability to teach. The *Vakava* tests candidates' ability to interpret educational research and draw inferences from that research; it is not a test of content mastery. Because teachers are recruited from the upper quartile of high school students in Finland, teacher candidates, by definition, have strong subject matter mastery coming out of high school. Overall, approximately 10 percent of applicants are selected each year to enter teacher education programs.

In Ontario, the Ministry of Training, Colleges and Universities sets a limit on the number of teachers to be certified. In 2013, the Ministry halved the number of openings in teacher education programs. These limits enable Ontario to control the number of surplus jobseekers and prevent overspending, and at the same time be more selective

in their teacher preparation programs, with an acceptance rate of approximately 17 percent in 2015. The majority of applicants to teachers colleges are in the top 30 percent of their college-going high school cohort, as secondary school grades are weighted heavily by teachers colleges. Unlike the other top-performing countries, Ontario has no standardized college entrance exam or teacher education program entrance exam, but some universities require candidates to put together portfolios or to teach demonstration lessons before admission.

In Shanghai, a municipal body monitors the total number of teachers each year and forecasts the number that will be needed. But unlike other jurisdictions, it does not necessarily limit the number of available places accordingly, and teachers prepared in Shanghai who are unable to find job placements are encouraged to teach in surrounding provinces, which often have shortages. Still, teacher candidates are drawn from approximately the top half of the college-going high school cohort, as measured by results of the high-stakes high school exit exam, the *gaokao*. Candidates who are eligible based on their *gaokao* score complete an individual and group interview assessing interpersonal abilities, collaboration skills, and passion for teaching, and conduct a demonstration lesson assessing skill in teaching. Only about 27.5 percent made it through this process in 2012.

In Singapore, there is only one teacher training institution, the National Institute of Education (NIE), which sets its entrance requirements and number of seats available in accordance with the Ministry of Education's policies. The Ministry annually analyzes trends in teacher requirements to anticipate

demand, and NIE opens only as many seats as the Ministry anticipates it will need each year. Applicants are recruited from the top third of the college-going high school cohort, as measured by scores on their A-level exams, and in order to be accepted, they must pass an entrance proficiency test assessing content mastery and complete a panel interview with a group of experienced principals assessing fitness and passion for teaching, communication skills, and rapport with children. While the number of candidates accepted into teacher education changes from year to year in alignment with demand, a forthcoming study reports that only one out of eight applicants is selected into the National Institute of Education annually.¹

Ensure That Candidates in Preparation Master the Content They Will Teach and How to Teach It

These screening processes are necessary because top-performing systems ensure that teacher preparation programs all require strong academic skills. Coursework is rigorous and dives deeply into the conceptual underpinnings of content areas. This is because teacher preparation programs in the highest-performing systems want teachers to master the content they will teach, understanding not just the big ideas and conceptual structure of that content area but where those ideas came from and what makes them so powerful, how to teach them, and how to correct student misunderstandings. All secondary school teachers major in a subject area they will teach, and often, elementary school teachers do too: many are required to specialize in a subject so that every elementary school has a designated content expert on staff who can mentor the other staff in that subject.

Furthermore, preparation programs also build teachers' skills in research so that they can identify students' misunderstandings, creatively design interventions, test them and evaluate outcomes, make refinements and publish results for their peers. And they give teachers practical experience in the classroom that spans all four years of study, gets progressively more challenging and tests and builds on the theories of pedagogy that are being taught in preparation program coursework. Practical experiences are supervised by trained mentors who are specially selected for their skill at mentoring and work closely with the preparation program staff.

Finland is the only jurisdiction where all teachers are required to have a master's degree. Primary school teachers minor in two curriculum areas that they will teach. Coursework is focused on mastering how to teach the content that teachers will teach, guided by the national curriculum framework, with 60 credits out of the 300 total credits required focused on learning how to teach the specific topics they will teach in depth. Other required courses include education research methodology (both qualitative and quantitative), and the fieldwork experience. Courses are often designed as problem-solving groups, where candidates work together to evaluate teaching scenarios. The practical experience spans three years totaling 19 weeks. In the first year, the focus is on observing trained teachers; in the third year, prospective teachers are expected to teach at least 50 lessons; in the fifth year, prospective teachers are responsible for developing lesson plans and teaching students all day, with supervision from a mentor. Until the fifth year, all clinical experience is conducted in "teacher training schools," where all staff have been trained in how

to observe teacher candidates and provide them with the support they need to improve, and schedules are organized so that all teacher training candidates are being observed by master teachers at all times. In the fifth year, clinical experiences are conducted in either teacher training schools or field schools, which have a high proportion of skilled teachers trained in mentoring novice teachers, but do not necessarily orient their schedules around observing teachers-in-training all the time.

Assuring teachers' mastery of content and of the skills needed to teach particular subjects well is, of course, among the most important things the top performers do. There is one thing that some of the top performers do that is supremely important – they require their elementary school teachers to specialize either in the teaching of mathematics and science or in the teaching of the country's native language and social studies. This may not be so important in countries in which high school graduates' command of the core curriculum is strong across the board, as it is in all the top performers, but it is impossible to overstate the importance of this structure in countries like the United States, in which high school graduates' command of both mathematics and science is so far behind that of the top-performing countries. A large fraction of U.S. elementary school teachers have taken as little mathematics in school as possible, have a poor command of the mathematics of arithmetic, fractions and proportion and do not like mathematics. There is good reason to believe that this is a strong contributor to the severe problems with mathematics and science in our middle and high schools.

A requirement by government that schools of education prepare subject

matter specialists at the elementary school level makes sense only if the schools are required to staff their elementary schools with specialists with the same organization of specialties, and that is indeed the case in the top-performing countries that organize teacher education in this way.

Turning to the structure of the teacher preparation systems in the high-performing jurisdictions, we see that, in Ontario, as in the United States, teachers may either pursue a four-year bachelor's degree in education, or a 2-year master's degree for candidates who already have a bachelor's degree in the subject they want to teach. In both degree programs, they must specialize in two subject areas, complete a practical experience of at least 80 days, take classes in theory, content and skills required to teach the Ontario curriculum, and research. The clinical experience is less tightly regulated than in Finland, but the jurisdiction has taken steps to improve it, recently doubling the length from 40 days to 80. In the master's program, this coursework culminates in a research project that is required to earn the master's degree.

All teachers in Shanghai are required to complete four years of coursework, and candidates complete annual research papers in each of the first three years, and a graduation thesis in the fourth year. Forty-five percent of courses are in the subject teachers will teach; 20 percent are in teacher education; 15 percent are in general education; and 20 percent are electives in subject mastery or education. These courses are aligned to the national curriculum framework. Candidates complete an 18-week teaching internship during their fourth year under the supervision of a master teacher. Shanghai Normal University, one of two teacher preparation

institutions in the jurisdiction, also requires two weeks of observing master teachers in schools in the third year.

In Singapore, most candidates complete the program leading to a bachelor's in education and requiring at least three-and-one-half years of study, although a two-year master's degree is also offered for career changers. All teachers must choose one content area in which to master and take coursework in four others. For each of their specialty subjects, they must take four semesters of teaching and learning courses, which are focused on how to teach the core curriculum in those subjects. Thus the teaching of the content and the way to teach that content are very closely aligned. Candidates must also complete problem-based learning projects, a portfolio and a year-long service-learning project. Two weeks of observation in schools, five weeks serving as a teaching assistant, and 15 weeks of teaching practice in schools are also required. For the teaching practice, both university professors of teaching and trained master teachers observe the candidates.

How do top-performing systems ensure that all preparation programs are delivering content mastery, research skill, and practical preparation - and doing all three tasks well? They sharply limit the number of programs offering teacher education to only the most prestigious and capable institutions, all of them research universities. In some cases, like Singapore, it started out that way. But in others, like Finland, it did not. Years ago Finland had a ratio of teacher education institutions to general population very similar to that of most American states, 35 to 40 institutions to a population of about 5 million. Then Finland shut them all down and reopened only a handful, all in their

research universities. Finland now has only eight providers of teacher education; Ontario has only 16; Shanghai has only two; and there is only one in Singapore. More detail on the content of the teacher education program of study in all four international top-performing jurisdictions can be found in the data tables under the indicator *"What is required for completion? How many years and what kind of courses? Is there a clinical experience and if so, how long? What are the success criteria?"*, as well as in the appendix.

Ensure That All Candidates Being Licensed and Hired Meet the Same Standards

Given how tightly most of the top-performing jurisdictions we benchmarked control both the quality of the pool going into preparation and the quality and rigor of preparation programs themselves, most did not find it necessary to implement a strategy in vogue in the United States: an exit exam of content mastery and teaching skill to ensure that those entering the profession are ready to teach. The one exception is Shanghai, where prospective teachers must pass tests in pedagogy, education psychology, and teaching methods prior to certification, and then additional tests administered by school districts in order to be hired to teach. This suggests that screening out those who are not ready to enter the classroom when they leave preparation programs is less necessary in jurisdictions like Finland and Singapore, where the system of recruiting candidates into teacher preparation is more rigorous and the programs themselves are world-class. However, it may still be worthwhile to invest in such policies in places with less advanced systems to ensure the caliber of candidates exiting preparation and to

monitor the quality and content of preparation programs.

There are two policies dealing with the quality of candidates entering the teaching force that are consistent across all top-performing international jurisdictions. First, they do not waive regulatory requirements by creating “alternative routes” into teaching, as we understand that term in the United States. There are no alternative routes. In other words, all teachers have completed coursework that meets the same standards for content mastery, research skills, and practical preparation. Although some have master’s degree programs that they term “alternative routes,” all meet the same regulatory standards of traditional preparation programs, unlike such routes in the United States.ⁱⁱ Teach For All, the international arm of Teach For America, does not serve any of the benchmark jurisdictions. (Although there is a Teach For China branch, Shanghai is not one of the municipalities that accepts its graduates.)ⁱⁱⁱ

Furthermore, all jurisdictions ensure that teachers who were prepared outside the jurisdiction meet the same standards for preparation as their peers. National or municipal officials evaluate all external and international applicants for teaching licenses on a case-by-case basis, agreeing to interview only those who can demonstrate via a portfolio of teaching that their preparation and experience is comparable to those of teachers prepared within the jurisdiction. Because of the supply and demand studies and the teacher recruitment efforts designed to match supply with demand and recruit top students into teaching, fewer hires come from outside of the jurisdiction because of shortages.

Top-Performing States

Ensure a High-Quality of Pool Selected for Teacher Preparation

Teacher education is decentralized in the United States, and each state has dozens of providers that accept almost all candidates that apply. States have traditionally exercised very little of their accrediting authority in order to ensure that teacher preparation programs are more selective. Furthermore, because teacher preparation programs have fiscal incentives to prepare as many candidates as they can support, states have not traditionally invested in supply and demand systems that would help them ensure that state resources are being used to prepare only as many teachers as are needed. This has changed somewhat as the federal government recently required states to begin tracking the number of candidates prepared and the outcomes of preparation programs more closely through Title II of the Higher Education Act. But in general, these studies are not paired with comparable studies of demand to enable the states to analyze where their graduates are most needed.

This narrative holds true in the states we analyzed. All the benchmark states – Massachusetts, New Hampshire, and New Jersey – prepare reports on teacher education as required annually by the federal government, but none linked their studies of teachers prepared in the state to the number of teachers needed. Many did not prepare enough teachers in high school mathematics and science as a result. In Massachusetts, a new initiative called the Preparation to Employment Pipeline offers data reports to districts showing which preparation programs new educators employed in their districts are coming from. Districts can then use these analytics to create strategic plans for sourcing their

teachers from the institutions they want, under the theory that the institutions that are perceived as the highest quality will experience the most demand. This initiative shows promise and may enable the state to recruit and staff its teachers more effectively.

In all three states, there are programs to recruit teachers in gap areas, such as rural geographic areas and the STEM fields. These efforts include the STEM Teachers Pipeline Fund in Massachusetts and the Woodrow Wilson Fellowship for STEM Teachers in New Jersey, as well as the Teach North recruitment initiative for placing teachers in rural northern New Hampshire. However, these kinds of fellowships do not fully address gaps in the STEM fields, let alone give the state a coherent picture of where all supply and demand issues exist.

Teacher “shortages” are actually a function of compensation and other factors that determine choice of occupation for new entrants and those already employed. This is especially true in teaching, where the supply of former members of the occupation now employed in other occupations is much larger than it is for many other occupations. But “shortages” are also a function of the standards states set for teachers. Lower the standards and shortages decrease; raise them and shortages increase. The most important point with respect to the issues addressed in this section is that the international top performers experience many fewer and less severe shortages of teachers than most American states because they have an oversupply of highly qualified teachers.

Because the benchmarked U.S. states do not monitor teacher demand or limit access to teacher education, teacher preparation programs, which span a

wide range of types of higher education institutions, are typically free to accept as many candidates as they wish, which is usually a function of their business model, since many universities keep their costs for teacher education programs as low as possible while charging significantly more than their cost, giving them a surplus they can use for other programs.

As in the top-performing jurisdictions, teacher preparation in the benchmark states may be offered as either a master’s degree or a bachelor’s degree. (Most programs in Massachusetts are master’s degree programs, but a few are bachelor’s degrees, while the majority of programs in New Hampshire and New Jersey are bachelor’s degrees). Unlike in the international jurisdictions, where candidates apply directly to teacher education programs when they first apply to university, candidates in the United States do not have to declare a major in education until they are already in college. States do not recruit their teacher candidates from any specific quartile of college-bound high school graduates. Prospective teachers apply to teaching programs in the second or third year of their bachelor’s degree, or their senior year if teacher training is part of a five-year combined bachelor’s and master’s degree program. For this reason, individuals essentially self-select into teaching, and “acceptance rates” for bachelor’s programs are at or near 100 percent everywhere. The most recent national study of students who choose to enter teacher education programs puts those students in the 50th percentile of all students taking the SAT. That would put them below the median of all students attending 2-year and 4-year colleges.^{iv}

Requirements for entry into teacher education programs typically include

maintaining a 2.75 or 3.0 GPA in undergraduate coursework to date, with New Jersey being the only benchmark state to require that preparation programs statewide have a 3.0 average GPA for their entire cohort. The largest providers of teachers in Massachusetts require undergraduate GPAs ranging from 2.8 to 3.0 for admission; in New Jersey, they require between a 2.75 and a 3.0. All that being said, an undergraduate GPA is a notoriously unreliable proxy for academic caliber, as it can mean many different things at different institutions. A standardized measure would be more reliable, but because GPAs are what states have chosen to measure, it is the only comparison available.

Ensure That Candidates in Preparation Master the Content They Will Teach and How to Teach It

Because the program of study in teacher preparation is not standardized in the United States, for each component of our analysis related to preparation program offerings or admissions criteria, we focused on three preparation programs in each state: the public research university that prepares the most teachers, the state college that prepares the most teachers, and the private institution that prepares the most teachers. These are listed in the table below.

Select Higher Education Institutions that Prepare Teachers by State

Type of Institution	Massachusetts	New Hampshire	New Jersey	Maryland
Research University	University of Massachusetts Amherst	University of New Hampshire	Rutgers University	University of Maryland College Park
State College	Salem State University	Southern New Hampshire University	Kean University	Towson University
Private College	Lesley University	Franklin Pierce University	Seton Hall University	Notre Dame of Maryland University

Most of these providers offer both bachelor's degree and master's degree routes into teaching. However, because Massachusetts requires that teachers eventually earn a master's degree to maintain their professional license, many teacher preparation programs in the state only offer teacher education as a master's degree. (That said, one of the providers we analyzed, Lesley University, offers a bachelor's degree route into teaching.) In New Hampshire and New Jersey, routes are primarily bachelor's degree programs, although

master's degrees are offered and can serve as additional credentials.

The typical teacher education program in the benchmark states requires courses in pedagogy and content areas, but it is not possible to teach prospective teachers how to teach the courses their students will take because curriculum is not standardized in the United States. All schools in New Jersey, as well as Lesley University in Massachusetts and Franklin Pierce University in New Hampshire, require students to declare education as a double major with

another academic subject that they will teach. For elementary schools, this can be a specific subject taught in elementary school. Courses in research methods are never required, although they may be offered through education policy departments and taken as electives. Practical experiences typically include 3-5 weeks of observation and 12-18 weeks of student teaching in the final year, although Lesley University requires closer to 30 weeks in total (one day per week for two years plus a full semester). We could find little evidence that supervising teachers for practical experience were trained in any way for this role, except at Seton Hall University in New Jersey, where they are required to attend semiannual workshops. All seemed to self-select into the program. In the top-performing jurisdictions outside the United States, mentor teachers are extensively and regularly trained, either selected for this responsibility on the basis of superb achievement as they ascend the career ladder, as in Singapore, or part of entire specially-designated teacher training schools, which are organized for the purpose of preparing new teachers, as in Finland.

States struggle with requiring a standardized and high-quality program of study emphasizing content mastery, diagnosis, research and practical experiences, because of the sheer number of institutions operating in these states. There are 81 accredited programs in Massachusetts, 16 in New Hampshire, and 26 in New Jersey.

To our knowledge, no state requires their teacher education institutions to prepare specialists in mathematics and science, or in English and social studies at the elementary school level.

Ensure That All Candidates Being Licensed and Hired Meet the Same Standards

Education ministries in the top-performing countries have much more control over their university-based schools of education than state higher boards or state departments of education do in the United States. In the first place, it is usually the case that higher education and elementary and secondary education are both administered by a single ministry. Second, tuition, funds for the university are provided directly to the institution rather than being given or loaned to the student, so the ministry has direct control over which institutions get how much money and for which purposes. In the benchmark states, unlike in the international top performers, the policy levers available to the state are weaker and rarer. It is much more difficult to make teacher preparation more selective and to require institutions to prepare candidates in the skills they will actually need to teach. Given the degree of decentralization of teacher preparation in U.S. states, it is no surprise that our states put more emphasis on exit standards for teacher education than do the top-performing countries. Most states require some form of exit exam for new teachers. This policy is designed to compensate for the loose regulation of preparation and ensure that candidates who have completed teacher preparation but not yet been hired as teachers meet some baseline qualifications. However, among the benchmark states, only Massachusetts and New Jersey have invested in a licensure standard that could be considered rigorous.

With the exception of Massachusetts, all the benchmark states have a statutory requirement that students must take the Praxis Core test of teaching skills and the Praxis II subject tests, assessing

content knowledge, in order to be licensed as a teacher. That said, all the teacher preparation programs we studied, outside of those in Massachusetts, and almost all nationwide, have adopted the Praxis Core as a baseline requirement for getting into teacher preparation, while the Praxis II is a requirement for exiting it. Studies of the Praxis Core have revealed that it is a poor predictor of later success in the classroom.^v

Furthermore, it is an exceptionally easy exam to pass. Although states have the authority to set statewide minimum cut scores for the Praxis Core, none of the states we surveyed opted to set a higher cut score than those recommended by Praxis test producer ETS: a 156 in Reading, a 162 in Writing, and a 150 in Mathematics. While score calculations vary from year to year, a test taker would generally have to answer about 60 percent of questions correctly in order to earn these scores. Furthermore, these scores are significantly below the median scores of 172 in Reading, 164 in Writing, and 152 in Mathematics. This means that all the states are intentionally recruiting teachers who can answer a bare majority of questions correctly and who score below average among their peers. The nationwide average pass rate for the Praxis Core is a 96 percent, and in the states we studied, it ranged from 92 to 99 percent.

Massachusetts, on the other hand, does not require the Praxis Core exam for entry into teacher preparation. It has developed a much more rigorous set of tests, the Massachusetts Test for Educator Licensure (MTEL), assessing literacy and writing ability along with proficiency in selected subject matter, which candidates are required to pass before they are certified as teachers.

All candidates are required to take the MTEL for Literacy Skills, along with additional tests depending on the subjects they will teach. Elementary school generalists may be required to take up to six tests, including special education, English as a Second Language, mathematics, general curriculum, literacy and writing, and foundations of reading, depending on the populations they serve. In the most recent administration (winter 2016,) 86 percent of first-time test takers passed the required Literacy Skills test on the first try (only 62 percent of those attempting the test again after failing did so.) But the average first-time pass rates for the special subject tests was only 62 percent, and when candidates who fail the subject tests go back and retake them, only 41 percent pass. Therefore, while the literacy test is a relatively low bar, the subject tests represent a demanding barrier to entry that students try to meet multiple times – with only some succeeding.^{vi}

New Jersey still requires both the Praxis Core as a test of pedagogical theory and the Praxis II as a test of content knowledge, but they also have recently implemented a new test of teaching skill. Starting in September 2017, teachers in New Jersey must also pass the edTPA: a performance-based, subject specific assessment developed by Stanford University that requires candidates to prepare a portfolio during their practicum, including lesson plans, video of their teaching and written analysis of the effectiveness of their technique and how they could improve.

This degree of testing may be necessary because benchmark states have all built in alternative routes that enable candidates in high-need fields to circumvent statutory requirements to be a teacher. Each state defines the requirements of alternative routes

slightly differently, but in general, candidates coming from alternative routes can become teachers by completing an internship under a mentor (of one year in New Hampshire and Massachusetts and 34 weeks in New Jersey) and submitting a portfolio of teaching for approval. Passing the Praxis Core and Praxis II is required in New Hampshire and New Jersey, and passing the MTEL is required in Massachusetts. Massachusetts and New Hampshire reported that 8 percent of their teachers came from alternative routes, while 34 percent of teachers in New Jersey did.

How Does Maryland Compare?

Ensure a High-Quality of Pool Selected for Teacher Preparation

In Maryland there are few policies in place to influence how selective teacher preparation institutions are when admitting teacher preparation candidates. Because Maryland uses CAEP accreditation standards for teacher education programs with 2,000 or more students, those programs must require an average undergraduate cohort GPA of 3.0 for admission. However, this GPA requirement is not written into statute, and so it may change. Of the three Maryland programs we surveyed, University of Maryland College Park and Towson University both required a 3.0 minimum GPA for candidates, while Notre Dame of Maryland University required a 3.2. These policies closely resemble the benchmark states, but they do not come close to the recruitment policies of the international top performers. These countries intentionally recruit from the top academic ranks of the college-bound graduating cohort: the top 50 percent in Shanghai, 33 percent in Singapore, 30 percent in Ontario, and 25 percent in Finland. Close to 100 percent of

candidates who apply to teacher preparation in Maryland are admitted, because they apply to preparation as a major once they have already been admitted to college. In contrast, acceptance rates in the international jurisdictions range from 10 to 27.5 percent, and candidates are required to complete demanding interview and assessment processes assessing passion for teaching, skill with children, collaborative and interpersonal skills, and academic caliber.

Maryland produces a comprehensive teacher demand study, the Teacher Staffing Report, every two years. It tracks content areas where teacher shortages are concentrated (STEM fields, specialists like librarians and special education teachers), geographic areas where shortages are concentrated (most counties in the state, but especially Baltimore City), as well as the percentage of conditional/emergency certified teachers, and matches them against the number of graduates from Maryland institutions. Using these data has enabled Maryland to course-correct when it has overproduced teachers in certain fields by requesting that preparation programs limit enrollments for some areas of certification in response to need. For example, Maryland overproduced the number of elementary school teachers it needed by 40 percent in 2011. When the state presented this data to teacher preparation providers, the three largest providers in the state, Towson University, the University of Maryland College Park, and Notre Dame University of Maryland, all chose voluntarily to reduce the number of seats available in elementary education. It is not clear to us that other providers have followed suit, given that the state has limited incentives to offer providers to ensure this will happen. Furthermore,

the state has now perhaps over-corrected for this surplus, and now under-produces elementary school teachers by 50 percent. This may be part of the reason the state now recruits approximately 60 percent of its teachers from out of state. These outcomes have resulted in large part because in our view, Maryland's Staffing Report is not used to annually match the needed number of teachers as efficiently as staffing systems such as Singapore and Finland, which directly fund their teacher preparation institutions in order to deliver the number of workers needed based on annual demand projections calculated by the respective ministries.

In 2014, the Task Force on Teacher Education, convened by the P-20 Council, released a report with recommendations including investing in an incentive fund to recruit and retain high-quality teachers to the highest-need schools, a recommendation that is echoed in the state's draft ESSA plan. The legislature responded, in part, by passing SB 666 in 2014, which sets up an incentive fund for prospective teachers. Maryland residents who have at least a 3.3 high school GPA, SAT scores of at least 1100 or ACT scores of at least 25, and pledge to teach in a high-poverty Maryland school, are eligible to receive 100 percent of tuition, room, board and fees at a Maryland public institution of higher education, or 50 percent at a private institution. Following graduation they must teach in high-needs schools (where at least 50 percent of students qualify for free and reduced meals) for at least the number of years in which they received state funding. However, these incentives have not yet been funded by the state.

International top performers go even further, by tying advancement along the teacher career ladder, described in

Building Block 6, to willingness to teach in hard-to-staff schools.

Ensure That Candidates in Preparation Master the Content They Will Teach and How to Teach It

Maryland's regulations for teacher preparation largely resemble those of the benchmark states. Teacher preparation programs in Maryland offer either a bachelor's or a master's degree route into teaching. In the three programs we studied – University of Maryland College Park, Towson University, and Notre Dame of Maryland University – candidates take methods of teaching courses in the subjects they will teach, but candidates teaching in elementary school do not have to specialize in one subject. Prospective secondary school teachers are required to major in the subject they will teach. Programs varied in the extent to which they imparted research skills to prospective teachers: no courses were offered in this arena at Towson, one course in research was required at Notre Dame of Maryland, and three courses in research were offered at University of Maryland College Park, but only at the master's degree level. These courses were not required. These programs of study, consistent across most of the top U.S. education programs, differ from the top international jurisdictions in several ways. They do not emphasize, or even address, research skills, diagnosis, and prescription, which are necessary for attempting new strategies and evaluating their impact and targeting instructional techniques to meet the needs of struggling students. They do not require elementary school teachers to specialize in either humanities or math and science, which would enable them to eventually serve as a content matter expert in their school. And most importantly, they do not dive deeply into how the content teachers will teach

works, why it works the way it does, the best strategies to teach it, what misunderstandings students typically have when they are taught it, how to address those misunderstandings and clarify the content, how to check students' understanding, and how to enrich their knowledge and extend and deepen the lesson.

One way in which Maryland distinguishes itself from the benchmark U.S. states, and resembles the highest-performing international jurisdictions like Finland, is in its requirement that all teacher candidates must have an internship experience in a designated Professional Development School. In these schools, candidates receive coaching and feedback from staff that have been specially selected and trained. The schools partner with local universities to stay up-to-date on what teacher candidates are learning. The Professional Development Schools also serve as sites where teachers have career-long access to ongoing professional development and training. All full-time students must have a minimum of 100 days in the Professional Development School, which is approximately the same length, or slightly longer, as the practical experiences in the top-performing international jurisdictions. In the programs we reviewed in Maryland, teachers began their practical experience in their junior year, with observations and small group work, and progressed to full-time student teaching in the senior year.

Ensure That All Candidates Being Licensed and Hired Meet the Same Standards

As we noted, of the top performers only Shanghai implements a standardized exam measuring whether teachers have mastered the content and skills they learned in teacher preparation when

they exit preparation programs. This is because other top performers have intensive recruitment practices that allow only candidates from the top half, third or quarter of their college-bound graduating cohort to apply to teacher preparation, and accept only those who can pass a demanding gauntlet of exams and interviews. No U.S. state has implemented recruitment practices anywhere close to this. Maryland, like the benchmark states, attempts to compensate for the relatively loose regulation on teacher preparation programs by attempting to control teacher quality at the point of licensure. That is, all require all teachers to pass an exam of baseline knowledge of content. The exams used in Maryland for this purpose are less rigorous than those employed in Massachusetts and New Jersey. In Maryland, candidates must earn passing scores on one of several approved exams: either the nationally recommended passing scores on Praxis Core of 156 for Reading, 162 for Writing, and 150 for Mathematics, a combined 1100 SAT score, (which is higher than the College-Board-recommended college readiness benchmark of 1030), a combined 297 GRE score (slightly below the world average GRE score of 302), or a combined 24 ACT score (higher than the ACT-recommended college-ready benchmark of 21). Most programs require these tests as a condition of admission, in order to ensure that their candidates are on track to licensure. Candidates must also pass the relevant Praxis content area tests. In 2015, the average passing rate statewide for all Praxis Core and Praxis content area tests for which data are available was 98.5 percent. Maryland does not require a test of teaching skill, such as the edTPA, statewide. The state does require all candidates to complete a portfolio of teaching, but does not specify what the portfolio should look like. The

University of Maryland system is using the edTPA to fulfill the portfolio requirement. But because the state does not require edTPA for certification, the edTPA submissions are not being officially scored according to edTPA guidelines, making comparisons with other states or use for out-of-state certification impossible.

As described above, the top performers assure the quality of the pool going into teacher preparation. Furthermore, they do not compromise on the caliber of preparation that candidates receive by allowing alternative routes that bypass regulatory standards for preparation. In contrast, like all the benchmark states, Maryland has created alternative routes that enable candidates in high-need fields to circumvent statutory requirements to be a teacher. The state defines an alternatively certified teacher as a provisional teacher, teaching in a critical shortage area, who completes a 4-8-week internship under the daily supervision of a mentor, followed by a one-year provisional residency under the supervision of a master teacher. This length of supervised time is longer than the benchmark states, which require between 34 weeks and one year of supervised mentorship. However, candidates are potentially still missing the content knowledge and coursework imparted in a traditional route program. Thirteen percent of Maryland program completers came from alternative routes in 2014, higher than eight percent in both Massachusetts and New Hampshire, but lower than 38 percent in New Jersey.

Furthermore, Maryland, unlike the other benchmarked states, has a challenge to ensure the quality of the 61 percent of newly certified teachers coming from out of state (2015). Teachers from out of state with a valid

out-of-state teaching license and at least three years of teaching experience in good standing are eligible for immediate licensure in Maryland. Those without three years of teaching experience can apply for reciprocity by submitting their transcript including proof of passing scores on Praxis Core and Praxis II subject test to the Maryland Department of Education.

Recommendations for Maryland

The key features of the systems that the top performers use to assure world-class teacher quality are:

World-class high school graduates

The whole pool from which the top performers are selecting their teachers is better educated than their opposite numbers in the United States, on average. Maryland's high school graduates are better than most, on a U.S. scale, but there is good reason to believe that their opposite numbers in the top-performing countries are better educated, especially in mathematics and science.

Teachers sourced from the top of the high school graduating class

The top performers are sourcing their teachers from a higher segment of their high school graduating classes than the United States is. There is no reason to believe that this does not apply to Maryland. If Maryland's high school graduates perform, on average, below those of the international top performers and we are selecting our teachers from a lower segment of high school graduates, then we can expect that the young people going into teaching in Maryland have a significantly poorer command of the subjects they teach than those entering teachers colleges in the top-performing countries.

Teacher education housed in research universities

The top-performing countries are restricting admissions to teacher education programs to the upper—and in some cases top—tiers of their higher education system. That not only assures a high-quality pool of candidate teachers going into teacher education, but it also enables them to offer their students a higher quality professoriate in institutions that value research and the use of research to improve practice in a disciplined way. Not least important, the experience of countries that are limiting teacher education to their top-tier universities is that they not only discourage low-performing high school graduates from applying, but they attract high-performing high school graduates who would not have considered going into teaching prior to these policy changes.

Elementary teachers specialize in mathematics/science or humanities

Because some of the top performers require their elementary school teachers to specialize in the teaching of either mathematics and science or their native language and social studies, they are able to give their students an excellent base in the fundamentals of mathematics and science on which they can build much stronger mastery of the STEM subjects in secondary school.

A career ladder in education

Because the top performers have constructed career ladders for teachers (see Building Block 6), they are able to make ascent of those ladders conditional on serving in schools serving high proportions of disadvantaged students, thus providing a steady supply of ambitious, highly competent teachers for these schools.

Incentives for becoming a teacher

Because some of the top performers offer free room, board and tuition in state teacher education institutions to the very top tier of graduating high school seniors who elect to serve in their schools (supplemented in the case of Singapore by the payment of a small salary to these trainees), these countries are able to attract some of their most able students into teaching and to send a signal to all high school graduates that their state, province or country places a very high value on their schools and young people who choose to teach in them.

What has just been described is not a list of discrete policies and practices. It is a list of components of a system, the parts and pieces of which are intended to work with and reinforce each other. We recommend that Maryland consider building such a system, building on some of the strong starts that have already been made in the state mentioned above.

ⁱ Darling-Hammond, L., Goodwin, L., & Low, E. (2017). Empowered educators in Singapore: How high-performing systems shape teaching quality. San Francisco, CA: Jossey-Bass.

ⁱⁱ <http://teachforall.org/en/get-involved/teach-in-your-country>

ⁱⁱⁱ <http://teachforall.org/en/national-organization/teach-china>

^{iv} Goldhaber, D., & Walsh, J. (2014). Rhetoric Versus Reality: Is the Academic Caliber of the Teacher Workforce Changing? Center for Education Data and Research, pp. 13-14.

^v <http://www.cedr.us/papers/value/2007-Everyones%20Doing%20It.pdf>

^{vi} <http://www.doe.mass.edu/mtel/results/2017-0212.html>

BUILDING BLOCK 6



REDESIGN SCHOOLS TO BE PLACES IN WHICH TEACHERS WILL
BE TREATED AS PROFESSIONALS, WITH INCENTIVES AND
SUPPORT TO CONTINUOUSLY IMPROVE THEIR PRACTICE
AND THE PERFORMANCE OF THEIR STUDENTS

The Benchmark

The top-performing systems have designed schools to be places in which teachers are treated as professionals, with incentives and support to continually improve their practice and the performance of their students.

To do this, they have policies in place to:

- ***Attract strong high school graduates into teaching and retain them***
These policies include: compensation systems that pay teachers comparable salaries to other high-status professionals at the beginning and throughout their careers; and ladders of career advancement for teachers so that as they get better at their work they can take on new roles, including leadership roles, mentoring roles, curriculum development roles and research roles, enabling them to grow in their careers without leaving teaching.
- ***Support new teachers***
New teachers are typically provided with mentors who offer feedback, support and strategies to help teachers do well in their new classrooms. Both new teachers and mentors are given time for this important work and mentors are generally highly skilled teachers at the upper levels of the career ladders who are trained to take on this responsibility and evaluated on how well they fulfill it.
- ***Help teachers continually improve their practice***
Teachers are given time and incentives to collaborate with their peers to: learn from and give feedback to one another; develop innovative tools and strategies to improve student outcomes; and research strategies and tools to address issues at their schools involving student learning. Teachers

do these activities in grade and subject groups at their schools, and this collaborative work is part of their job. Many teachers are also given opportunities to collaborate with teachers beyond those in their own school to share proven, effective practices across their districts and countries. This work is teacher-driven, but within a framework of the reform strategies important to the school and the overall system. The work done in these collaborative groups is tied to the teacher evaluation system, and its quality is part of the criteria for career advancement. Teachers also pursue individual professional development opportunities that are in line with an annual development plan designed in consultation with their principal and, in some cases, a mentor.

Together, these practices create a dynamic and professional work environment that values expertise and incentivizes teachers to get better and better at the work, and, at the same time, creates a culture and form of work organization that provides deep and very effective support for teachers as they work together to improve student learning.

International Top Performers

Attract Strong High School Graduates into Teaching and Retain Them

Compensation systems

The top-performing international jurisdictions pay teachers at similar levels to other high-status professions, at the start of and throughout their careers. In Finland, the starting salary of teachers is higher than the starting salary of engineers; in Ontario and Singapore, teachers' starting salaries are higher than those of accountants. Teachers' average salary in Finland,

Ontario and Singapore is higher than the average salary of nurses (and accountants in Ontario and Singapore), although it lags behind that of engineers. However, even when salaries lag behind some high-status professions, they are reasonably close. The difference in average salaries is often less than 10 percent, as it is for teachers and engineers in Ontario. Only in Singapore did the gap in average salaries of teachers and high-status professions in the private sector ever exceed 20 percent. Overall though, in all of the international jurisdictions, the most capable and qualified graduates have a strong monetary incentive to enter teaching, and to stick with it.

Career ladder systems

The top-performing international jurisdictions give teachers the opportunity to earn not only higher pay over time, but also increasing responsibility and leadership opportunities, unlike in the United States, where teachers are essentially compensated on the basis of time in service and the accumulation of continuing education credits that need not have any relation to their work.

The top performers vary in the level of structure they have created to facilitate this career progression. Shanghai and Singapore both have highly defined career ladder systems. As part of the annual evaluation system, teachers must demonstrate competence against a set of explicit criteria. Those that do so successfully move up the ladder and attain increasing levels of pay and responsibility, from leading induction activities and mentorship for new teachers, to demonstrating expert lessons in front of hundreds of peers. Although there are minimum years of experience that teachers must have in order to reach each stage of the ladder,

it is competence that determines whether they actually move up. Singapore's career ladder system is especially tailored for the variety of skills and interests that teachers may have and the skills the system values. It includes three tracks: teaching, leadership, and curriculum specialists. These paths allow teachers to take on different kinds of roles to advance in their career as an educator.

Ontario and Finland do not have concretely mapped out career ladders for teachers, but both jurisdictions ensure that teachers are offered opportunities for additional pay and responsibilities outside of the classroom. In Ontario, teachers can add Additional Qualifications to their license through ongoing professional learning, and these endorsements enable them to mentor their peers and pursue other leadership opportunities. Experienced and entrepreneurial teachers are also invited to apply for the Teacher Learning and Leadership Program, where teachers can collaboratively research problems and design and lead professional development for their peers across the province. In Finland, neither the nation nor individual municipalities have codified a formal career ladder structure in regulations. This is considered unnecessary because the expectation is that schools are run democratically, with teachers sharing responsibility for administration and instructional leadership with principals. School principals do delegate additional responsibilities to their expert teachers, and write those responsibilities into their job descriptions while decreasing the amount of time they are expected to teach.

Support New Teachers

Unlike in the , where estimates of how many teachers leave after five years range widely from 17 percent to 50 percent, very few teachers leave the profession in the top-performing international jurisdictions, likely because, among other reasons, they are supported on the job when they first enter the classroom. Three of the four top-performing international jurisdictions — Shanghai, Ontario and Singapore — provide structured mentorship experiences for new teachers.

The mentorship experiences in the three jurisdictions are one year in Ontario (with an optional second year), two years in Singapore and three years in Shanghai. Mentors observe their mentees, coach them, and provide detailed feedback on their teaching.

These mentorships have the following key features: 1) Mentors are carefully selected from among a corps of high quality and experienced teachers and are trained to mentor new teachers; 2) Both mentors and new teachers are given release time during the school day for mentoring activities; and 3) Mentoring includes a range of activities including observation and feedback on teaching, modeling teaching strategies by expert teachers, feedback on how the particular content is taught, and help on grading student work and using rubrics.

In Singapore, for example, new teachers have their teaching load reduced by 20 percent to free up time for this support. Mentor coordinators at each school ensure that new teachers receive coaching and feedback from mentors both in their grade level and in their area of specialty. In Ontario, the province requires release time but does not prescribe the amount although most teachers report receiving the equivalent

of six days per year. In both Singapore and Shanghai, becoming a mentor is a reward for progression up the career ladder, so mentors all have the experience and demonstrated teaching skill to successfully mentor their peers. Furthermore, a mentor's continued progression up the ladder is tied to the success in the classroom of their mentees. In Ontario, mentors are required to be teachers in good standing with knowledge of curriculum and demonstrated problem-solving skills. They also receive mentor training.

In the three jurisdictions, new teachers are also required to participate in professional development and training activities in addition to being mentored.

The exception is Finland. There, the focus on tightly quality-controlled teacher preparation has traditionally led policymakers to consider the creation of a national program of teacher induction unnecessary. Many schools and municipalities, on their own, offer induction programs but only about one-third of new teachers report that they have participated. Recently, however, both the Ministry of Education and the teachers' unions have recommended the development of a standardized induction for new teachers so this is likely to change in the next period of time. For more about the intense, five-year master's program that all teachers in Finland complete in order to master how to teach the specific content they will teach as well as how to research, diagnose, and prescribe solutions, see *Building Block 5: Assure an Abundant Supply of Highly Qualified Teachers with the Necessary Dispositions, Knowledge and Skills*.

Help Teachers Continually Improve Their Practice

In the United States, the prevailing image of professional development is of an activity the purpose of which is to develop the skills and knowledge of educators in a setting that is typically some form of workshop. Time spent in professional development is time away from school and from the real work of the teacher. This image of professional development has a lot in common with the prevailing image of training for blue-collar workers. For professionals, however, learning how to get better at the work is inseparable from the work itself. That is what we see in the world's top-performing education systems. These systems typically offer, and in some cases, require formal instruction for teachers in a workshop setting, but the most important professional development is embedded in the work itself.

The key is the way teachers' time is used and the way the work of the school is organized. Teacher ratios in the top-performing countries are similar to those in the United States, but teachers' time is used differently. Much less of teachers' time is spent in front of students; much more time is spent working with other teachers in groups to improve lessons and teaching techniques, working with students in small groups and tutoring individual students. Teachers work in grade level teams and subject matter teams to do this. When they take on a problem they want to address—the way they teach fractions, for example, in elementary school—they will form a team, carefully research the way that issue is addressed worldwide, come back with a report to their teammates on what they found, formulate a plan based on their research, create an evaluation plan for assessing whether they are achieving

their goals and then create new lessons. One teacher will demonstrate the lesson and the other members will critique it, over and over again, until their data shows that they are achieving the learning gains they are looking for. Many teachers will then teach it, with the others looking on and critiquing their performance. The results are often perfectly crafted lessons, delivered with remarkable effect. This whole process constitutes a very powerful system of professional development, from the teachers' participation in the research process, to the systematic development of a design for addressing the problem, to the critiques from peers to the participation in the R&D cycle that is built into the whole process.

In Singapore and Shanghai, teachers regularly meet in standing groups across grades and subjects to improve and plan lessons, research instructional issues, and discuss other issues confronting them in their classrooms including how to better serve struggling students. Teachers often team-teach to enable teachers to work individually or in small groups with struggling students.

In Ontario, the province sets the expectation that schools will implement professional learning communities to create and practice lessons and to assess their own teaching and the teaching of others. In addition, "collaborative inquiry" is a strategy for province-wide professional development, as in the current Collaborative Inquiry for Learning in Mathematics, which organizes cross-school and cross-district teams to diagnose gaps in student performance and strategize ways to address these. In Finland, it is not required but there is an expectation that teachers in schools will work together as professional learning communities to develop, implement and reflect on

improvement strategies for student learning and the school overall.

Teachers devote much of their school day to assessing student work, conducting research, evaluating and planning lessons with other teachers.

Many teachers in these jurisdictions are also strongly encouraged – especially at the higher levels of the career ladder – to collaborate beyond their own schools, so that they are sharing new and innovative best practices across their districts and country. For example, Ontario’s Teacher Learning and Leadership Program gives teachers a platform by which they can train others on new and innovative practices they have developed in response to problems they and their peers have identified and collaboratively researched. In Singapore, the Academy of Singapore Teachers, which is based at the National Institute of Education, coordinates sharing and dissemination of best practice from teachers at different schools. They also provide resources and training to schools to enable them to set up and maintain professional learning communities.

While these forms of school organization and roles for teachers in these schools are the primary engines of professional development in the top-performing countries, teachers in these countries have other resources for professional learning and improvement. Beyond the protected time for collaborating with their peers to share best practices, problem-solve and develop high-quality tools and innovations as described above, there are district and school-based professional development leaders and coordinators to support schools and teachers in sharing best practices, and funding for additional professional development chosen by individual teachers as long as it fits into annual

professional development goals agreed to by the teacher and a supervisor.

For example, in Singapore, teachers have 100 hours of professional development per year to use as they see fit, including pursuing study abroad opportunities to learn from schools and teachers in other countries. In Shanghai, after spending 120 hours on professional development their first year, teachers are required to spend 240 hours on professional development every five years. Senior teachers need to spend even more time: 540 hours every five years. In Ontario, it is the equivalent to Shanghai at six days each year and in Finland it is left to the discretion of each school to allot the amount of time it sees best.

Teachers in these jurisdictions have time to take on these additional responsibilities and participate in so much collaborative planning because they spend far less of their time in front of children. In Shanghai, teachers spend 50 percent of their working hours or less teaching, with some estimates putting the amount of time they spend teaching at 12 to 15 hours per week (24-30 percent).ⁱ Teachers in Finland report working an average of 36 hours per week, with 21 hours being used for teaching (58 percent). Only 5 hours (14 percent) are used for individual planning; the rest may be devoted to collaboration and other activities.ⁱⁱ Teachers in Singapore report working 56 hours per week, only 17 of which are used for teaching (30 percent). Eight hours (14 percent) are used for individual planning.ⁱⁱⁱ In Ontario, teachers work 55 hours per week, teaching during only 25 of them (45 percent), with another 7 hours (13 percent) devoted to individual planning. The rest are used for other activities.^{iv}

One reason these jurisdictions can afford to have teachers teach for so much less time is because they have either larger class sizes or shorter school days. In the Asian jurisdictions, Singapore and Shanghai, class sizes are much larger than anywhere in the United States. The Shanghai Municipal Education Commission stipulates that class size should be fewer than 40, with an average class size of 35. However, some schools that accept the children of migrant workers are permitted to increase the class size.^v In China as a whole, the average is 38 for primary

schools and 52 for secondary schools.^{vi} In Singapore, average class sizes are 34 students in primary schools and 35 in secondary schools.^{vii} On the other hand, in Finland, average class sizes are lower than in the : 19 for primary and 20 for secondary. In the United States, they are 21 for primary and 27 for secondary.^{viii} Teachers have the time they need to plan, practice, and collaborate because school days, on the whole, are much shorter in Finland than in other countries. These data points are summarized in Table 1 below.:

Table 1: Teachers' Working Conditions and Attrition

	<i>Working Hours/ Week</i>	<i>Teaching Hours/ Week</i>	<i>Percent of Time Spent Teaching</i>	<i>Average Class Size (Elementary)</i>	<i>Average Class Size (Secondary)</i>
<i>Finland</i>	36	21	58%	19	20
<i>Ontario</i>	55	25	45%	n.d., by statute may not exceed 25 ^{ix}	n.d., by statute, may not exceed 22 ^x
<i>Shanghai</i>	50	15	30%	38	52
<i>Singapore</i>	56	17	30%	34	35
<i>USA</i>	45	27	60%	21	27

In addition to resources and time, the top performers also provide teachers with incentives to improve performance through evaluation systems that enable teachers to reflect on their performance, set personal goals, and gain the opportunity to take on new responsibilities when they meet those goals. In Finland, Ontario, and Singapore, evaluations include a classroom observation component, but the focus is not on principals telling

teachers how they need to improve. Instead, teachers are expected to reflect on their performance and set their own goals for improvement, based on student performance, a set of teaching competencies, or both. Principals coach their teachers on resources that are available to help them meet these goals. In Singapore, those that meet their agreed-upon goals are rewarded with advancement on the career ladder. Teachers are expected to pursue

professional development opportunities that will directly help them to meet the goals they have set.

These strategies – higher pay, increasing responsibility over the course of teachers’ careers, structured support for new teachers and dedicated resources and time for professional learning, improvement, and collaboration – result in teachers who view teaching as a career and stay in the profession.

Attrition rates, the rate that teachers leave the classroom, are much lower in the top-performing countries than the United States. In Singapore, the attrition rate for teachers is less than 3 percent annually.^{xi} The Toronto School District retained 98 percent of first-year hires annually between 2005 and 2010.^{xii} And in Finland, 90 percent of teachers stay in teaching until they retire.^{xiii}

Top-Performing States

U.S. states are not as far along in designing schools to be places that treat teachers as professionals as are the international jurisdictions. In general, U.S. states do not pay teachers competitively with other high-status professions nor do they offer career ladders for advancement for teachers, except in a few districts and states. And while there are increasing efforts among states to require teacher induction programs and support teacher professional collaboration, these are generally not as tightly structured and comprehensive as those in the top international jurisdictions.

Attract Strong High School Graduates into Teaching and Retain Them

None of the top-performing states compensates teachers at levels comparable to those of other high status professionals, which makes attracting strong high school graduates into teaching challenging. Both starting and

average teacher pay in Massachusetts, New Hampshire and New Jersey lag behind that of registered nurses, accountants, and engineers. As a result, talented graduates are discouraged from entering teaching as opposed to more lucrative careers that require similar levels of education, and existing teachers have a monetary incentive to switch careers to other, higher-paying fields.

Furthermore, teachers in these states usually do not have formal, or even informal, ways to take on increasing responsibilities through demonstrated performance. Teachers can command higher pay by earning endorsements on their licenses through ongoing education. But this is not the same as the career ladder systems practiced by the top performers for two reasons: first, because advancement is tied to completion of coursework rather than demonstrated growth, competency, or mastery; and second and more importantly, because additional endorsements do not lead to additional responsibilities aligned to teachers’ skills and interests, or to a form of work organization that distributes responsibility and incentivizes collaboration and continuous improvement. As a result, teachers continue to have essentially the same job throughout their entire careers. Massachusetts, notably, is designing a modified career ladder with “performance-based endorsements” for teacher licenses. It would allow districts to propose individual pay scales for additional responsibilities teachers with these endorsements can take on. One district in the state, Lawrence, has implemented its own five-step career ladder.^{xiv}

Support New Teachers

Among the top-performing states, Massachusetts and New Jersey include statewide induction programs that require new teachers to be mentored for one year following certification. New Hampshire provides state-level guidance for induction of new teachers, but gives districts the choice of whether to implement mentorship programs. In Massachusetts, mentors are required by state regulation to be trained and to receive release time to observe and coach. In New Jersey, mentors must have three years of teaching experience and highly effective or effective ratings on their most recent teacher evaluations. They too must be trained, but in both Massachusetts and New Jersey training is left to districts and there is no state oversight. Neither state has a statewide, formal process for recruiting or identifying potential mentors: individual recruitment and hiring practices for mentors are left to individual districts. As a result, the states have no way of being sure that their mentors are providing high-quality induction experiences for new teachers.

Help Teachers Continually Improve Their Practice

None of the benchmark states have as carefully designed a system for developing teacher practice as do the top-performing international jurisdictions. However, providing teachers with time, incentives, resources, and support to improve, including the opportunity to collaborate with their peers, is an area that the states have begun to align their practices with the top performers. All three benchmark states have implemented teacher evaluation systems that are based in part on principal and peer observations of their classrooms. All teachers are required to develop their

own personalized professional development plans, based on goals they set for improvement. Positive teacher evaluation results can give teachers more autonomy to choose how they develop these plans; negative evaluation results make the plans more prescriptive. Furthermore, in all three states there are school districts experimenting with rewarding teachers who have effective performance ratings with monetary bonuses, although the specifics of these incentives are determined at the district level. As a result, some teachers have the opportunity to reflect on their performance annually with incentives to improve their scores.

All three states have online professional development portals, where teachers can access as well as submit resources, best practices, and model lessons. Teachers are expected to pursue professional development opportunities and must complete a set number of hours of professional development in order to be recertified every three years. Finally, all states are making efforts to encourage collaborative professional learning communities as the preferred form of professional development for teachers, and within Massachusetts, Boston has begun the process of ensuring that all schools have set up a professional learning community structure.

Even though states have made some strides in this area, their strategies still differ from the practice of international top performers in important ways. First, no state has a policy that would set aside close to the 40 percent of a teacher's day for planning, research, development and other collaborative work that we see in a number of top performers. Second, none have tied their teacher evaluation systems to advancement up a career ladder, so it is

unclear what the incentive is to work for a positive evaluation and none have included in their evaluation criteria that are central to moving up the career ladder in key jurisdictions, like mentoring ability, leadership potential and ability to use scientific methods to improve instruction. Finally, professional development communities can be a foundation for effective teaming in schools, but often falls short of that potential; teaming works in the top-performing countries because meeting together is a means to an end, not the end in itself. The expectations for teams are clear and operational and the culture of the school creates an environment in which all the teachers on the team have a strong incentive to contribute the best they have to offer to the work.

Finally, although states are encouraging teachers to collaborate through professional learning communities, evidence is by no means clear that this collaboration is occurring widely at the district level, and plenty of evidence exists that traditional forms of professional development, focused on presentations and workshops, continue to dominate.

How Does Maryland Compare?

Attract Top High School Graduates to Teaching and Retain Teachers in the Profession

Compensation Systems

Maryland, like the top-performing states, does not pay teachers at levels comparable to other high-status professions. The average statewide starting salary for teachers was \$34,234 in 2015, which consistently lagged behind other professions, often by margins of 50 percent. Teachers' average salaries also lagged behind other professions, by margins of 35-55

percent. This again is similar to New Hampshire and New Jersey, although the gap in Massachusetts is much smaller, between 8 and 12 percent. Maryland does offer additional pay for teachers who have earned National Board for Professional Teaching Standards certifications, a practice not seen in any of the benchmark states, but which is a practice of 22 other states in the This additional pay will double from \$2,000 to \$4,000 annually starting in 2019.

The state compensation levels are in stark contrast to the international jurisdictions, where teacher starting salaries are often higher than starting salaries for high status professions. Average teachers salaries are also often higher than other professions and, when lower (as they are for engineers and accountants in Singapore, engineers in Ontario and lawyers in Shanghai), they are usually lower by less than 25 percent, and sometimes only slightly lower.

Career ladder systems

Maryland has no statewide career ladder system for teachers, although Baltimore City's pilot system is further along than pilots in the other benchmark states, which are all experimenting with career ladders. Baltimore City's system gives teachers opportunities to earn higher pay and increased responsibilities by submitting research projects, evidence of effective teaching and principal recommendations to panels of their peers. The state does have a Mathematics Instructional Leader designation, for teachers who get advanced training in mathematics content knowledge, pedagogical content knowledge and instructional leadership.

The international jurisdictions have much more developed career ladder systems than anywhere in the , including in the top states. Massachusetts is the only top-performing state with even a design for a state-level system. Among the top-performing countries, formal career ladders for teachers exist jurisdiction-wide in Singapore and Shanghai, where they are the backbone of the systems' recruitment, retention and professional development systems. In Ontario and Finland, the professional status of teachers and opportunities for differentiated roles creates comparable incentives for retention and professional development.

Support for New Teachers

Maryland, like Massachusetts and New Jersey, has a statewide induction program for new teachers. All teachers on an initial license are required to participate until they receive tenure after three years. The program includes orientation, support from a mentor involving both observation and co-teaching opportunities, a role for the mentor in giving feedback on teacher evaluations and protected time for mentoring activities. Maryland does have an induction coordinator for each school district and the state provides orientation training for all new mentors, but, as in Massachusetts and New Jersey, mentors are self-selected and receive minimal ongoing training at the discretion of local districts. New Hampshire provides guidance on mentoring and induction, but leaves the decision of whether to implement a program to the districts.

In Ontario, Shanghai and Singapore, the induction systems are more tightly structured and monitored: mentors are

recruited, selected through an interview process, trained and evaluated.

The 2016 Maryland Teacher Induction, Retention and Advancement Act (TIRA) established a stakeholder group to develop recommendations for strengthening induction in the state. The draft recommendations include: integrating mentoring during the teacher training practicum with mentorship during induction and establishing formal qualifications for mentor teachers such as tenure, five years of teaching experience, and highly effective ratings on teacher evaluation and principal recommendations.

Help Teachers Continually Improve their Practice

Maryland sets professional development requirements for teachers who must earn an "advanced teaching credential" to continue teaching after five years of teaching by taking 36 hours of professional development including 21 hours of graduate credit, earning a master's degree in education or earning a certification from the National Board for Professional Teaching Standards along with 12 hours of graduate work. After earning this advanced credential, Maryland does not require any further professional development. Massachusetts and New Hampshire require 100 hours and 75 hours, respectively, of professional development every three years for recertification. New Jersey only requires 20 hours of professional development for a one-time recertification of a provisional license, with no additional requirements.

Like the benchmark states, Maryland generally leaves provision of this professional development to districts. It does have Teacher Professional

Development Standards that provide a framework for districts to follow. But, as in the benchmark states, professional development is offered and quality controlled at the district level. The exception has been a series of regional conferences and cross-district seminars aimed at helping with implementation of the Common Core State Standards.

Notably, Maryland's standards for professional development encourage the development of "vibrant learning communities" and the state is also supporting a pilot Collaborative Coaching Model. This offers a protocol for collaborating but lets districts define the content of the collaboration. It is currently being piloted with an expectation that it may be implemented statewide in the 2017-2018 school year. Still, there is no state-level protection of time for teachers to collaborate. This is the case in the benchmark states as well, although several large school districts in Massachusetts, including Boston, have required that teachers have specific hours set aside for collaborative work. Two districts in the state extended the school day in order to build in these hours.

Support for teacher development is much more highly structured and prioritized in the benchmark countries outside the United States. In Shanghai, teachers are required to take 120 hours of professional development during their first year and 240 hours every five years after that. Senior-level teachers are

required to take 540 hours every five years. In Singapore, all teachers are required to have 100 hours of professional development each year. In Ontario, it is the equivalent of Shanghai at 6 days per year, while Finland allows local municipalities and schools flexibility to allocate time for professional development as they see best. This is shown in Table 2 below.

In addition to time spent in training and workshops, professional learning is built into the school day, and teachers are given significant time to do this work. Indeed, teachers in all of the jurisdictions teach far fewer hours each week than in the In Singapore, for example, teachers have 20 hours per week for collaborative work with other teachers. In Shanghai, teachers only teach an average of 12 hours each week, with the remaining hours spent on collaborative teacher meetings and other school-related work. This collaborative work is formalized, with standing teacher groups that meet regularly, often weekly. The work of these groups is tied to teacher evaluation and the tools and materials developed by these teacher groups are field-tested and implemented in the schools. In Ontario, there are fewer organized teacher groups at the schools, but professional development is provided by master teachers who are recruited to design and facilitate professional development for other teachers through the Teacher Training and Leadership program.

Table 2: Teachers' Required Professional Development

<i>Jurisdiction</i>	
<i>Finland</i>	No specific requirements
<i>Ontario</i>	6 days (or 48 hours) per year
<i>Shanghai</i>	240 hours every 5 years (equivalent to 48 hours per year); 540 hours every 5 years (108 hours per year) for Senior Teachers
<i>Singapore</i>	100 hours per year
<i>Massachusetts</i>	Varies by teacher specialty, years of experience and education level, but typically 100 hours every three years for recertification (33 hours per year)
<i>New Hampshire</i>	75 hours every three years for recertification (25 hours per year)
<i>New Jersey</i>	20 hours to earn a permanent certification (one-time, after one year)
<i>Maryland</i>	<p>After 5 years of teaching, teachers must do one of the following:</p> <ul style="list-style-type: none"> • Complete 36 hours of approved content or professional education coursework, including 21 hours of graduate credit; • Earn a master's degree directly related to public school education, including 6 semester hours related to the teacher's specific discipline; or • Obtain National Board certification and earn at least 12 hours of graduate course work.

Recommendations for Maryland

In the recommendations for Building Block 5, which mainly deals with the sourcing, education and initial training of teachers, we described the measures the top performers use to execute those functions. Among those functions is raising the standards for entering schools of education. But, if Maryland were to significantly raise the standards for becoming a teacher, it would provoke a shortage of teachers if it did not at the same time make teaching more attractive as an occupation.

The top performers do this both by making the initial compensation of teachers comparable to the compensation of people starting high-status professional careers and by changing the conditions of work for

teachers so, rather than resembling the careers of blue collar workers, they more closely resemble the careers and conditions of work for modern professionals in the advanced industrial nations.

Maryland has made a start in these directions in the ways that were described above, but there is a long way to go, especially with respect to the top performers beyond the borders of the United States.

We recommend that Maryland pay particular attention to the following gaps.

Narrow the Gap in Compensation Between Teaching and the High Status Professions

If Maryland wants to recruit top-notch

high school graduates into the profession and keep them in it, the state needs to consider strategies for closing the gap between teachers' compensation and the compensation of high-status professionals in the state. By "compensation," we mean both cash compensation and benefits. As it does so, the state needs to keep in mind the tradeoffs among class size, teacher-pupil ratios, teacher salaries and the time teachers have to work together to systematically improve student performance that we reported on.

Teacher salaries are, of course, now set by school districts, not by the state. But, if the state agrees that teacher salaries are a very important determinant of teacher quality, the state may want to consider negotiating teacher salaries at the state rather than the district level. Among the reasons to consider this are to assure that the best teachers are fairly distributed across the state and that schools serving high proportions of disadvantaged and special education students get more teachers than schools serving more advantaged students, which is common practice in the top-performing countries.

Build a Statewide Teacher Career Ladder System

Career ladder systems for teachers serve two very important functions. The first is to create real careers in teaching as a way to attract very capable young people into teaching who are willing to invest heavily in their own development and to work very hard at their profession as long as they are assured that the investment and the hard work will pay off in career advancement for people who are very good at the work. In many ways these are the hallmarks of professional work in high-status professions. And, in various forms, it is what we see in most of the top-performing countries' education

systems. Second, and relatedly, career ladder systems are a way to tie compensation to performance in a way that is characteristic of professional forms of work organization, in contrast to most American pay-for-performance or merit pay programs, which are built on a blue-collar model of compensation. We conclude that Maryland should give very careful consideration to the development of a strong career ladder system for its teachers (tied, as is described in the narrative for Building Block 8, to a career ladder for school leaders). A beginning has been made in this direction in Baltimore City. We suggest that Maryland pay particular attention in the design of its system to the design of Singapore's or Shanghai's career ladder system. Singapore has three broad pathways within its educator career ladder system: teaching, leadership and specialist. Shanghai's ladder includes such responsibilities as mentoring, training other teachers within a teacher's school or across the district, and conducting or leading research on teaching and learning.

Strengthen Induction by Making Requirements for Mentors More Stringent and Monitor Quality

Maryland would do well to implement the recommendations the TIRA Working Group has already put forward to strengthen teacher induction in the state. These include establishing requirements for hiring and training mentors and integrating induction with the practicum from teacher preparation. When the career ladder system for teachers is established, it should include steps on the ladder that qualify the teachers advancing up the ladder to serve as mentors and, in this way, the state system for mentoring new teachers could be tied to the standards for serving as a mentor that are built into the career ladder system. This is what

happens in the top-performing countries.

Change the Way Schools Are Organized and Managed in Maryland to Make Them More Effective and to Create a More Professional Environment for Teaching

Maryland has made significant progress in establishing Professional Learning Communities (PLCs) in schools throughout the state. The Collaborative Coaching model provides a common framework and language for coaching across the state and trains teacher leads from each school to ensure consistency and gather statewide feedback. But much more needs to be done to create modern forms of professional work organization in the schools, with the same potential to dramatically improve student performance that we see in

Singapore and Shanghai. The state should consider the development of strategies for providing incentives and resources for school districts to reorganize schools to reflect the forms of work organization described above, including, but by no means limited to, reserving up to 40 percent of a teacher's time in school for work that does not involve facing students in class, organizing teachers into teams structured by subject and grade level to take on major projects designed to improve student performance, providing time for teachers to work with individual students and small groups of students who need special help, and time to visit with parents in their homes when necessary. The jurisdictions that are moving in this direction are among the highest performers in the world.

ⁱ Isaacs, T., et al. (2015). "Aligned Instructional Systems: Shanghai." p. 14.

ⁱⁱ OECD (2014). TALIS Country Note – Finland. Retrieved from <http://www.oecd.org/finland/TALIS-2013-country-note-Finland.pdf>

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BUILDING BLOCK 7:



CREATE AN EFFECTIVE SYSTEM OF CAREER
AND TECHNICAL EDUCATION AND TRAINING

The Benchmark

Key to a healthy economy is an effective system of career and technical education (CTE), which is also sometimes known as vocational education and training (VET) in other countries. These CTE systems offer a viable route to well-paying occupations as well as post-secondary education and training. Employers often take the lead in designing CTE programs to ensure that students are working towards standards that reflect industry expectations and current skill needs. The world's top-performing CTE systems have several important characteristics, including:

- CTE is seen as a high-quality pathway with both employment and post-secondary options for graduates
- Training is available in a wide range of attractive careers
- Students receive career guidance and counseling
- Students participate in authentic work-based learning experiences
- Programs lead to industry qualifications
- Qualifications meet global standards and are reviewed on a regular basis
- Teachers are kept up-to-date with industry best practices

In the international top performers, CTE attracts strong students, and, far from being perceived as a dead-end alternative for students who are academically weak, it is seen as an attractive option for students who have what it takes to rise to very senior positions in the corporate world and other sectors. More often than not, these systems enroll 40 percent or more of their high school class and postsecondary students. Indeed, systems that enroll fewer than 40 percent in CTE appear to be in danger of

creating the perception that their CTE system is for students who are academically weak and whose prospects are poor. That perception is often self-fulfilling.

What typically attracts students with strong academic backgrounds to CTE is the applied nature of the program, which many students prefer to what they perceive as boring and lacking in opportunities to assume responsibility in an adult world. These students prize the opportunity to combine work and learning in a setting in which the abstractions they master in the classroom can be applied within the hour in an authentic work setting, and they can gain the skills needed to be successful in that setting under the supervision of highly competent adults.

It is important to note that whether the majority of expense is borne by employers or by the public, international top-performing CTE systems are expensive. The countries that choose to bear that expense usually do so because there is a strong consensus among the public that they want an economy that is based on broadly shared prosperity and do not wish to compete with other countries on the basis of low wages but instead on the basis of high skills. Countries in which there is no such consensus have a hard time raising the money needed to produce a workforce with strong technical skills at all levels of employment.

In the section that follows, we have benchmarked two of the world's strongest CTE systems, those of Switzerland and Singapore. Switzerland falls just outside of the top ten performers on PISA. The Swiss vocational system is largely employer-based, with much of the instruction taking place at the employers'

worksites. Singapore's system is largely school-based. Approximately 70 percent of Swiss students are in their CTE system. In Singapore, a similarly large fraction of students attend their Institutes of Technical Education and their polytechnics. This gives the Maryland Commission two different world-class models of CTE to learn from. We chose to omit China in this indicator as the system does not yet meet many of the criteria for high performing CTE systems as we will describe them.

In addition to Singapore and Switzerland, we have also benchmarked the CTE systems in Finland and Ontario, two other top-performing systems with developed CTE systems in place. In the United States, we profile Massachusetts, New Jersey and New Hampshire and have added Delaware. We believe Delaware offers one of the best models on how to bring together government, business, and higher education partners to revamp and reinvigorate a state CTE system.

International Top Performers

CTE Seen as a High-Quality Pathway with Both Employment and Post-Secondary Pathway Options for Graduates

In the international jurisdictions we benchmark, vocational education begins in upper secondary school after students have succeeded in completing a rigorous, common program of study in the core academic subjects. International top-performing CTE systems are designed to allow young people to move from vocational programs to post-secondary academic or technical programs and vice versa. In other words, these systems allow for mobility between types of education and training after students leave secondary school. They also provide a system with no dead-ends, in which students at any

level of the system can go on for more education and training at even higher levels if they so choose. This feature is a particularly important factor in attracting ambitious students with strong academic backgrounds who might otherwise see CTE as limiting their opportunities. Results of strong CTE systems can be seen in youth unemployment rates and other indicators of success in post-secondary education such as low remedial rates and on-time graduation.

Switzerland's CTE system is designed as a "dual" vocational education and training system where students combine learning in school with learning in the workplace. CTE is the mainstream upper secondary program, serving 70 percent of Swiss students.¹ Employer organizations and associations are highly involved in supporting and driving the system to ensure that the next generation of workers has the skills necessary to meet rigorous industry standards across numerous industries, from banking to healthcare to high-tech manufacturing. Students in CTE programs in Switzerland are supported early in their education careers through a system of Career Centers run by industry associations and supported by state and municipal governments. Some industry associations, in partnership with education, labor and government also provide students with classes in broad industry knowledge and skills and core academics in Skills Centers that they run where students go when they are not in the workplace. The system has a very strong reputation within Switzerland and attracts not only a majority of high school students, but students with very strong academic skills. Students are paid during their apprenticeships and with certifications in hand, have very strong career prospects.

By age 25, 95 percent of Swiss young people have completed an upper-secondary qualification. In 2015, 15 percent of vocational graduates also obtained a Federal Vocational Baccalaureate (FVB) which allows them to enroll in a Swiss university of applied sciences (UAS) without taking an entrance examination.² An OECD report notes that vocational school graduates have a lower unemployment rate (3.1 percent) than those with a general education (5.1 percent).³ The Swiss youth unemployment level is quite low at 8.4 percent.

Singapore is notable for its success in “rebranding” vocational education from a low status pathway to a valued and respected option for students. After compulsory education ends at around age 15 or 16, students can choose to go to junior college (academic) for 2-3 years, a polytechnic for 3 years of industry-oriented education, or the Institute of Technical Education (ITE) for 1-2 years leading to a National ITE Certificate. Approximately 53 percent of students enroll in one of the five polytechnics and another 6 percent enroll at the Institute of Technical Education (ITE)—the other 41 percent transition into junior colleges. (Around 33 percent of those eligible for junior colleges choose the more skills-based education of a polytechnic.)⁴

As of 2014, 87 percent of ITE graduates were hired in their fields within six months of graduation, leading more students to see vocational education as a strong choice for future success. Within ten years of leaving the Institute of Technical Education, about half of graduates will go back to school, most of them to the polytechnics for a diploma. And a significant fraction of polytechnic graduates will go on to university, either right after they get their diploma or later on.⁵

In Finland, students are drawn to CTE pathways because they offer both theoretical and applied learning along with the opportunity to continue higher education after receiving a professional qualification. After compulsory education ends at approximately age 16, 42 percent of Finland’s high school students transition to vocational upper-secondary programs compared to 50 percent who transition to general upper-secondary education.⁶ Vocational programs typically last for three years and are full-time programs of study, requiring six months of on-the-job learning during the three-year period. CTE offerings are defined by national qualification requirements developed by the Finnish National Board of Education in cooperation with employers and unions so as to align with the country’s economic and labor market needs.⁷ Students leave the program with extensive basic skills in their field and a specialization in one particular area. Graduates then have the option of entering a polytechnic college, moving directly into university, or pursuing a job. In 2013, 68 percent of students who received an upper secondary vocational qualification were employed one year after graduation.⁸

In Canada, at the secondary level vocational education courses are offered starting as early as grade 11 either alongside academic courses in a comprehensive high school or, occasionally, in separate vocational schools, depending on the province. In Ontario, secondary school students can participate in “Specialist High Skills Majors” (SHSM), which are programs of eight to ten classes available in 18 industry or trade fields, including aviation, energy, transportation, hospitality and tourism, and health and wellness. The SHSM program has grown rapidly since its introduction in

the 2006-07 school year. In the 2015-16 school year, there were 1,760 SHSM programs with more than 46,000 students enrolled. This represents approximately 12 percent of all grade 11 and 12 students, although in some school board districts, the percentage is as high as 40 percent.⁹ The Ontario Ministry of Education credits the popular SHSM programs with raising the overall high school graduation rate to 85.5 percent in 2014-2015.¹⁰

Students completing CTE courses in a high skills major graduate from high school with both a high school diploma and industry certification and can then enter the workforce, a post-secondary program to expand and enhance their skills, or an apprenticeship in their occupational area or trade. A 2011 survey showed that within six months of graduating from high school 64 percent of SHSM students were pursuing a postsecondary program: 31 percent in university, 27 percent in college, and 6 percent in an apprenticeship/pre-apprenticeship.¹¹

Training Available in a Wide Range of Attractive Careers

The international top performers offer CTE programs that prepare students for a wide range of high-wage, high-skill occupations that are in demand by employers. The industry mix is purposely broad, giving students a chance to experience a variety of career areas. Students select a CTE pathway of interest that combines academic and technical learning and can extend into further education.

The Switzerland CTE program has strong support from employers who credit it as a major contributor to the continuing vitality and strength of the Swiss economy. Small and large companies play a role in supporting student apprentices, preparing them for

a wide range of occupations—high-tech, human service, health, as well as traditional trades and crafts.¹² The most popular choice is the commercial sector, which includes 21 areas of specialization including banking, retail, public administration, and some areas of IT.¹³

Singapore's CTE system is a key part of the country's economic development strategy. The role of the Institute of Technical Education (ITE) is to ensure that its graduates have the technical knowledge and skills relevant to industry. ITE is the national authority for the setting of skill standards and the certification of skills in Singapore. Seats in each program at the Institutes of Technical Education (ITE) are based on projections of the country's job openings by occupation and the identification of sectors in which Singapore wants to have a strong industrial presence. As of this year, there are 95 full-time courses in the ITE, divided into 11 sectors.¹⁴ Polytechnics offer a wide range of three-year diploma courses preparing students for jobs in more than 50 industries from aeronautical engineering to banking and finance to digital animation.

In Finland, CTE is organized into eight different fields: humanities and education; culture; social science, business and administration; natural sciences; technology, communication and transport; natural resources and the environment; social services, health and sport; and tourism, catering and domestic services. There are specializations leading to about 120 study programs in total.¹⁵ The vocational curricula are defined by national qualification requirements developed by the Finnish National Board of Education. They are created in partnership with employer organizations and trade unions.

While employers are engaged as partners in Ontario, they are not driving the system the same way as in Switzerland, Singapore and Finland. The 19 selected career areas are the industries deemed to be in demand by the Ministry of Education.¹⁶ The career certifications and curricula were developed in consultation with employer, industry, and union representatives from each sector.¹⁷ The SHSM frameworks are designed to ensure that students have opportunities to pursue work, apprenticeship, college and university. Postsecondary institutions and business leaders provide input into the content of the frameworks.¹⁸

Students Receive Career Guidance and Counseling

The top-performing countries typically begin offering students vocational education training opportunities after they have completed a common program of academic study through age 15. These CTE programs are built on the assumption that the students entering them have mastered the core academic subjects at a high level. These systems provide strong career advising for students, usually beginning in the early teen years and often extending into adulthood. This helps students navigate the wide range of career pathway programs available to them, selecting one that fits their personal and career interests.

In Switzerland, local career guidance centers (outside of the schools) help vocational students find an apprenticeship and learn about the labor market during their search. These community-based career centers are specially organized and staffed to help young people interested in pursuing vocational pathways transition from grade 9 (the end of compulsory

schooling at around age 16) into a Federal VET Diploma Program, directly into a two-year apprenticeship, or into a 10th grade transition year for those who are not ready. Students can access career interest inventories, get help with resume writing and portfolio development, and sample prospective apprenticeship sites.¹⁹

Singapore's Education and Career Guidance (ECG) focuses on equipping students with the necessary knowledge, skills and values to make informed decisions at each education stage for successful transition from school to further education or work. The ECG curriculum emphasizes different aspects as students progress from primary to post-secondary school levels. For every five secondary school/junior college/centralized institute students, there is one assigned counselor.²⁰ Counselors undergo extensive training to provide them with a realistic understanding of the economy. The training includes information from Singapore's Economic Development Board on job projections. Employers are involved in career guidance activities, making videos and hosting student visits. Students from polytechnics and ITE receive 40-60 hours of systematic career counseling. The content focuses on helping students to develop skills to make career choices and transition into the workplace. The curriculum also includes out-of-classroom activities, including industry immersion programs, talks, workshops, and individual and group career guidance sessions.²¹

Career guidance in Finland begins during the first two weeks of high school. Students spend these two weeks developing their academic and career goals and planning accordingly. When students enter the vocational track in upper secondary school, they take at

least 1.5 credits of guidance counseling to help them navigate education and training options, occupations, and the world of work.²² Each student develops an individual study plan that documents progress in their studies, along with an assessment of learning, identification and recognition of student competencies, on-the-job learning experiences, and vocational skills demonstrations.

In Ontario, the SHSM program incorporates career exploration activities, allowing students to explore career options through worksite tours, career conferences or competitions, simulation activities, and contact with a career mentor. Students are also required to have “Reach Ahead Experiences” to help them make informed choices about future careers. This can include interviewing an employee in the field of work they are considering, visiting an approved apprenticeship delivery site, or attending a college or university class in their area of interest.²³

Students Participate in Authentic Work-Based Learning Experiences

International top-performing systems offer applied learning either in real-work settings, or in simulated work experiences in schools, both with state-of-the-art equipment. In either case, instructors in CTE programs typically have had long tenure in industry and often continue to stay in touch with industry by rotating periodically through state-of-the-art workplaces. Programs of study for CTE students in top-performing international systems are driven by industry in partnership with the education system and often labor unions. Whether through industry associations or organized by state government with industry and labor, the development of standards,

assessments and certification for CTE programs of study are the responsibility of these groups.

Switzerland’s CTE program offers an extensive work-based learning experience, with students spending three to four years in an apprenticeship. Well-respected global employers, such as Credit Suisse, ABB and Swisscom, provide paid apprenticeships to students, with students doing real entry-level work under the guidance of credentialed trainers within the company.²⁴ Employers ensure there are enough apprenticeship slots for all students who want them. Employers pay a below-market wage rate, with students earning an average monthly wage of \$600 to \$700, rising to around \$1,100 to \$1,200 by the time they are in their third year.²⁵

In Singapore, because vocational training at the polytechnics and ITE takes place on the campus (rather than in an actual worksite), the government ensures that the institutions have the most up-to-date equipment, highly trained faculty, and strong connections to the business community. The practical, hands-on training and the involvement of Singapore employers working in partnership with educators to design programs of study and evaluate students, ensures that students are ready to meet industry standards in a wide variety of industries including Singapore’s growing IT sector, business consulting, finance and distribution industries. In addition, Singapore created the SkillsFuture Council, a national task force of government officials and business leaders, to develop plans to create structured on-the-job training at the workplace which would be paired with classes at the polytechnics or ITE.²⁶ The government intends to offer monetary incentives to encourage employer participation. The

curricula will be designed in consultation with industry to ensure relevance. This is based on the recommendations of the ASPIRE (Applied Study in Polytechnics and ITE Review) Committee released in 2014.

In Finland, vocational upper secondary education is a three-year program that includes at least half a year of on-the-job learning in the workplace. Students do not get paid. The objective is to give students the opportunity to apply learning in practice.²⁷ It is unclear if there are enough apprenticeship slots for all students who want them. Finland does have a comprehensive Youth Guarantee Scheme. The Finnish scheme has led to personalized plans for young people being drawn up more quickly, ultimately lowering unemployment. In fact, Finland has the lowest long-term unemployment rate for young people in the EU.²⁸

Ontario's SHSM program requires that students complete a minimum of two credits (total of 220 hours) in cooperative education in a work-based setting. Placements vary in length, but tend to be short-term experiences.²⁹ It appears that cooperative learning slots are often limited and depend on a school's ability to find employer partners.

Programs Lead to Industry Qualifications

CTE systems in international top-performing jurisdictions are designed to ensure that qualifications received by CTE students reflect state-of-the-art practice in an industry area and include the broad knowledge and skills, occupation-specific skills and employability skills needed for success in entry-level jobs across any given industry as well as prepare students to enter post-secondary education or training. Vocational qualifications go way beyond the traditional crafts and

trades to include demanding technical careers in every major industry.

In Switzerland, each industry sector, in partnership with the State Secretariat for Education, Research, and Innovation (SERI), develops qualifications and assessments for the industry, establishes curriculum, and provides, through their affiliated training companies, varying amounts of course work during the three- or four-year upper secondary vocational education program. Each occupational area has a qualification that is attained through a final assessment, and is standardized across the country. Students who complete the CTE program earn a nationally recognized qualification that is portable, and the opportunity to move directly into full-time employment or to continue on to additional education or training.³⁰

In Singapore, the employer community is deeply involved in advising the various CTE institutions and programs, in setting occupational standards, and in assessing candidates for diplomas.³¹ Members of the business community sit on the Board of the ITEs and Polytechnics and participate in developing programs of study. The SkillsFuture Earn and Learn Program provides opportunities for ITE and polytechnic graduates to continue their studies toward a diploma or one of Singapore's Workforce Skills Qualifications (WSQ) while completing a structured training program on the job. The WSQ is a national credential system that certifies skills and competencies against industry-established work standards.

The Finnish CTE system is based on a vocational qualifications framework developed in cooperation with employers. Assessments are built into the vocational education experience to

ensure that by the end of the three-year program students who are successful earn industry-recognized credentials.³²

In Ontario, students graduating from the SHSM program receive both a high school diploma and industry certification. However, industry certifications are rather limited, often covering only first aid, CPR and other safety qualifications that can give students an advantage when entering the workplace. They do not fully qualify students to begin work in a technical field, but rather give an indication that a student has been exposed to a particular career area. Students receive a Red Seal on their Ontario Secondary School Diploma when they complete a specific set of 8 to 10 courses in their selected field of vocational study.³³

Qualifications Meet Global Standards and Are Reviewed on a Regular Basis

In the benchmarked jurisdictions, employers play an important role in regularly reviewing and updating the qualifications and industry credentials so that students are prepared for entry-level jobs in high-growth careers.

In Switzerland, employers take the lead in determining when new occupational programs need to be developed in response to changes in the economy. Similarly, they determine when existing programs need to be revised and/or discontinued. The level of support from businesses is impressive. The employer community—the association and the member companies that employ apprentices—contribute about 60 percent of the total cost of the CTE system.³⁴

Singapore has the most robust system linking its CTE system to larger economic development goals. Every year the Ministries of Manpower and Education, the economic development

agencies, and the post-secondary institutions come together to discuss the manpower needs for the economy in the coming years. The discussion influences the programs and courses to be offered by polytechnics and the Institutes of Technical Education (ITE). Both the polytechnics and the ITEs have a robust curriculum development and review process to ensure that they meet industry standards. Their Academic Advisory Committees include industry leaders and professionals who advise them on trends and developments in the industry sector.³⁵ For example, the ITE training has shifted from a manufacturing focus to a greater emphasis on training for the services sector in the last ten years. This is in line with the government's economic policies and manpower projections.

The Finnish National Board of Education revised the qualification requirements for vocational qualifications in partnership with employers in 2014. The Qualification Requirements are reformed on the average every 5 to 10 years, but they can be renewed when necessary, either partially or completely. The cycle of revision and updating is influenced by changes to the qualifications structure and legislation, changes in the relevant occupations and changing needs in the world of work.³⁶

The Ontario College of Trades, an industry-driven professional regulatory body, has the mandate and powers to regulate all approved trades in Ontario, including setting standards for training and certification and identifying the competencies that must be demonstrated. In August 2014, the Ontario Ministry of Training, Colleges and Universities announced that all 45 publicly assisted colleges and universities had signed agreements to ensure that their programs are linked to

the economic needs of local and global employers and that the programs are coordinated across the province. Ontario will periodically survey programs to ensure that the range of economic needs in the province are met.³⁷

Teachers Kept Up-to-Date with Industry Best Practices

Teachers in international top-performing CTE systems often have backgrounds and experience in their industry area and they are given opportunities to stay up-to-date with employer skill expectations.

The Swiss Federal Institute for Vocational Education and Training (SFIVET) offers training courses leading to a federal certificate for people who work in industry and wish to teach part-time in a CTE school at upper secondary level. Entry requirements for the training course include a higher education degree in the relevant field and at least six months of work experience in the field. SFIVET provides a wide range of ongoing learning opportunities for vocational teachers, from pedagogy to industry-specific training. Firms need to meet quality standards to be licensed to take apprentices. To acquire a license, companies must meet technical and staff criteria and demonstrate that the content of the training meets the needs of the occupation.³⁸

Singapore's Institute of Technical Education's human resource policy requires consistent and continual training and development of teachers. The ITE colleges require staff to go back to industry for a relevant assignment for a minimum of three months. A new Total System Capability Scheme was instituted in 2007, targeting 85 percent of the faculty to remain up-to-date in their industry by demonstrating ability

to "Do or Lead" in consultancy or industry projects. Those who do not do this are not eligible for promotion.³⁹ As of 2015, 95 percent of ITE staff have met this goal.⁴⁰ Teaching staff in the polytechnics are provided regular professional development on the latest pedagogical practices and industry content.

Finland is known for its high-quality teaching pool. Teachers of vocational subjects are required to have an appropriate Master's degree or a polytechnic degree (or the highest possible qualification in their occupational field) plus three years of work experience in the field. Vocational teachers are trained in pedagogy and teaching practice at five vocational teacher education colleges and one Swedish-speaking university. This training is provided free of charge for students. Vocational teachers are also required to participate in continuing training each year (usually up to 5 hours per school year) to keep their classroom competencies up-to-date. In addition, many teachers take part in on-the-job learning periods.⁴¹ Alongside teachers, there are workplace instructors who supervise students during on-the-job learning periods. These are generally experienced foremen and skilled workers who guide students and assess their vocational skills.⁴²

Typically, SHSM career teachers in Ontario are already teaching in the school and have a special interest or expertise in delivering CTE instruction. There is no minimum requirement specified but teacher expertise is a factor taken into account by the Ministry of Education when approving SHSM programs. However, in a number of the sectors that have the major credits aligned with Technological Education, teachers are required to have industry experience. In the SHSM funding

formula, there is funding specifically aimed at providing resources for professional development, allowing teaching to stay current with industry requirements.⁴³

Top-Performing States

In the United States, for most students, the four years of high school are not formally differentiated in terms of an academic or a vocational focus. Some students will choose to take honors and AP classes if they intend to apply to selective universities. In many cases, CTE classes are recommended for those students who are not going on to a four-year college or who struggle with academic work. And not all students will complete a designed sequence of CTE programming (as a CTE concentrator). Students entering these courses can come into vocational programs having taken not only different core academic courses, but different levels of challenge within the core academic sequence. Limited career guidance is available, with a U.S. average ratio of one counselor to 491 students. In fact, nine U.S. states report ratios *above* 1:600.⁴⁴ In some states, CTE students attend regional vocational high schools, some having more interaction with industry than others.

Many CTE high school programs are focused on the traditional crafts and trades such as auto mechanics and hairdressing. That said, pockets of excellence can be found across the United States. The movement in high schools, driven at the federal level, to identify 16 career clusters that cover the U.S. economy, and the introduction of the Common Core State Standards, has led a number of states to revamp their CTE systems at the high school level, often focusing on certain fields that the state believes are important engines of the regional economy. Other states have

built career academies that combine academic and occupational studies and some work-based learning. On the whole, students in U.S. high schools who are taking vocational courses do not have the opportunity to experience in-depth, work-based learning in their field of study prior to graduation. Comprehensive high schools that offer vocational courses often have a difficult time procuring state-of-the-art equipment as well as struggle to recruit teachers with up-to-date experience in the occupational area.

In this Building Block, we compare the experience of a 15- or 16-year-old in the UNITED STATES with those in the top-performing countries. We explore how U.S. high school students learn about CTE programs, the courses they take, the work-based learning experiences offered, the teacher training, the role of employers, and graduate outcomes. That said, it is important to note that students can also receive technical training at the community college level. In the United States, the Carl D. Perkins Career and Technical Education Act (known as Perkins) provides almost \$1.3 billion in federal support for CTE programs at both the secondary and post-secondary level in all 50 states.

In this section, we highlight features of the CTE secondary systems in the benchmark states, Massachusetts, New Hampshire, New Jersey, and Delaware. We include Delaware as a model as it has recently engaged in an overhaul of its CTE system, described below.

As background, Massachusetts, New Hampshire, and New Jersey's CTE systems are all organized around regional vocational-technical school districts. Massachusetts is unique in that the state has created specific laws, regulations, and guidelines pertaining to the structure, delivery and

requirements for vocational education, which falls under MGL Chapter 74 Law. Therefore, there are state-approved programs known as “Chapter 74” programs as well as Perkins supported programs. Perkins programs must meet specific criteria but are not automatically considered Chapter 74 programs as they have not been formally approved with an on-site review of the facilities, equipment, and program of study by the Department of Education’s Office for Career/Vocational Technical Education.

The Delaware Pathways initiative began in 2014, creating a regional career pathway system informed by labor market needs. It offers students the opportunity to earn industry-recognized credentials, 6-15 early college credits, and relevant work experience. Now in place in almost 90 percent of all high schools in the state, student participation in Pathways CTE programs is up to 6,000 in just three years. The initiative is supported by a formalized governance structure that includes the K12 system, businesses, higher education, and community agencies and organizations. The Pathways partners are establishing a statewide workforce intermediary to link educators and employers and scale work-based learning opportunities for both high school and college students.

CTE Seen as a High-Quality Pathway with Both Employment and Post-Secondary Pathway Options for Graduates

In other countries, vocational education is delivered through focused and rigorous programs of study that meet employer expectations for entry-level skills. The same approach is not taken in the United States. In most instances, students have CTE class options while in high school and they are viewed as introductory electives to test out

possible career interests. Even when states define a complete program of study (usually 3 courses), these CTE concentrators in the United States are not experiencing programs of equal dosage, rigor or quality of the international top performers. Nor are U.S. student enrollment rates as high. While the percentages of students enrolling in CTE programs in the benchmark states are comparable or higher than the U.S. average of 19 percent of public high school graduates who were CTE concentrators⁴⁵, they do not compare with the highest performing international systems, which attract sometimes half or more of the student population.

However, Massachusetts’ regional vocational technical schools have a substantial waiting list. These schools have had success in not only giving students a strong technical training but also producing strong scores on the state’s standardized academic test (MCAS). New Jersey reports that demand for CTE seats exceeds space available at most schools. The state’s county-based vocational-technical school career academies have long been recognized as among the highest performing high schools.⁴⁶ These students outperform their peers on the High School Proficiency Assessment in both mathematics and English Language Arts. Economically disadvantaged and special needs students who enroll in a New Jersey CTE program often show the most significant gains.⁴⁷

Enrollment in the Delaware Pathways CTE programs is growing every year. The state has an ambitious goal of having more than 20,000 students (approximately half of all students in grades 9-12) enrolled in career pathways that prepare them for in-demand occupations by 2020. State officials are

also monitoring the demographic data of students enrolled in the pathways to ensure that there is gender, racial and ethnic balance.

Training Available in a Wide Range of Attractive Careers

The benchmark states use the 16 National Career Clusters as a starting point or conceptual framework for organizing their CTE programs at the high school level. These Career Clusters were designed to cover the entire world of work, however they are quite broad and each state offers different programs within each career cluster, some very narrow related to particular jobs and others in an occupational area. In general, the benchmark states are not putting students on a pathway to high-skill, high-wage careers. For example, the Manufacturing cluster programs often include narrow programs focused on Woodworking, Machine Shop Technology, and Welding. Human Services may just be limited to Cosmetology. Not all career cluster areas have offerings. In some cases, industry certification is the goal for students, in other cases, education institutions certify completers' knowledge and skills.

To select the Delaware Pathways CTE career areas, Department of Education officials worked with officials from higher education and industry to examine labor data and identify fast-growing fields that required some post-secondary training and that paid relatively high wages. These included health sciences (expected to grow by 15 percent by 2024) and information technology (expected to grow by 13 percent by 2024). The partners then collaborated to develop a course of study that would develop the skills necessary for entry-level employment.

Students Receive Career Guidance and Counseling

Massachusetts has the most comprehensive career guidance structure of the benchmark states we reviewed. All Chapter 74 CTE programs require students to complete a Career Plan—a comprehensive, formalized written plan that relates learning to career goals. The Plan takes into consideration both formal and informal assessment and includes areas in which a learner needs to increase knowledge and skills to reach documented goals. The Department of Elementary and Secondary Education recently released the Massachusetts Guide for Implementing Individual Learning Plans (ILP). The ILP is a student directed, multi-year, dynamic tool that maps academic plans, personal/social growth, and career development activities while taking into account the student's unique, self-defined interests, needs, and goals for the attainment of postsecondary success. The ILP is suggested to begin in the middle school and continue through high school. And the ILP, though driven by the student, is created with guidance from a school mentor (not necessarily a guidance counselor) and shared with family and other stakeholders. When used as planned, the ILP and the Career Plan are revisited throughout the year.

Massachusetts also has developed a curriculum to guide career planning called the MA Model for Comprehensive School Counseling (The Model). The Model offers a framework for the development and implementation of school counseling programs that promote student success in academic and technical, workplace readiness, and personal social domains. The Model was designed to ensure that students receive the guidance, supports

and interventions necessary for post-secondary success.

Additionally, schools with five or more Chapter 74 programs are required (and some other schools choose) to enroll students in a Career Exploratory program. Exploratory programs, typically offered in the first year of high school, allow students to experience different occupational fields before they select their preferred areas of concentration. Students spend a half-year in Exploratory, rotating through all of the programs a school offers or a subset of programs, depending on the Exploratory model the school has developed. The most recent data available indicates that 14,124 CTE students out of a total of 52,865, or nearly 25 percent of all CTE students, participated in Exploratory programs in 2014.⁴⁸

In Delaware, state officials are working to strengthen school counseling in the middle grades (and perhaps earlier) to provide students with a greater awareness of potential careers and pathway options in high school. The goal is to engage students, parents, teachers and counselors to help students consider their interests and strengths in making career pathways selections.

Students Participate in Authentic Work-Based Learning Experiences

In general, in the United States, CTE programs do not have enough employer partners to provide apprenticeship or significant work-based learning experiences for all students.

While Massachusetts does not require work-based learning experiences, some students do participate in cooperative education during their junior year of high school. Students are paid wages while accruing high school credit on a worksite related to their technical

program in lieu of participating in their technical classes in a school setting. The amount of time spent in work-based learning varies, ranging from 40 hours to 125 hours or more, depending on the program. In 2014, 2,490 students participated in cooperative education, up from 1,359 in 2009. Other forms of work-based learning include job shadowing, internships, or community-based learning projects.⁴⁹

In New Jersey, CTE programs must include at least one Structured Learning Experience (SLE). SLEs may be paid or unpaid. They can include community service, internships, job shadowing, volunteering, cooperative education, or working in a school-based enterprise. As an example of one of the more intensive programs, the Monmouth County Vocational School District's Academy of Allied Health and Science curriculum includes a rotation at a local hospital for students in the 10th grade, leading to an eight-week internship for students in their senior year.⁵⁰

Delaware Pathways CTE programs include student internships ranging from 240-400 hours. Most of these take place in the summer or during the senior year of high school. The state community college, Delaware Tech, is planning to hire a team to take on the intermediary role of arranging student work-based learning experiences. The state has set of a goal of supporting work-based experiences for 2,500 high school and 5,700 post-secondary students in the 2018-19 school year. This would represent approximately 25 percent of all CTE concentrators in the state.

Programs Lead to Industry Qualifications

At the high school level in the benchmark states, most high school students in CTE programs work towards developing competencies in

their chosen career cluster. Some are issued industry certification, but others earn a state-approved certificate that attests to their mastery of these competencies. It is more common for students to earn industry-recognized credentials at the post-secondary level.

Qualifications Meet Global Standards and Are Reviewed on a Regular Basis

Typically in the United States, educational institutions determine available pathways to credentials, with varying levels of input from employers and industry groups. The review and revision process is often ad hoc without a clear timeline or method for updating standards to meet current industry needs.

Most of the benchmarked states do update industry-recognized credentials. Each state indicates that employer representatives participate on advisory committees and that they validate frameworks and credentials, but details are not always readily available on how this is done and with what frequency. Massachusetts recently convened teams of technical and academic teachers to update the Vocational Education Frameworks. Part of that process involved evaluating the value of credentials on the current list and identifying new credentials attainable by secondary students. The validation process for the revised frameworks and the identified credentials included review and comments from nearly 700 program advisory committee members, including industry and post-secondary representatives, from across the state.⁵¹ Delaware has made efforts to establish state advisory boards for each career cluster to review CTE programs of study to make sure they reflect the economic development needs of Delaware and that business and higher education are consulted.

Teachers Kept Up-to-Date with Industry Best Practices

Each state varies in its initial licensing requirements for vocational education teachers. Some states require only basic teacher licensing, others require a degree in the occupational field that they will teach, and some require industry experience. The requirements may also vary depending on the career cluster program area. Delaware stands out in that it relies on college and university partners to provide some or all of their career-related coursework and these teachers are more likely than high school teachers to have worked in the field. Teachers at Delaware Tech, for example, have extensive industry experience. The state also relies on business partners to ensure that the materials and equipment used in the school-based courses represents the best in the field. Because the Pathways programs have been implemented so quickly, the state has issued some waivers to school districts to allow them to hire people from industry who lack teaching certification as CTE teachers.

All states require their teachers to accumulate professional learning credits in order to be re-certified. In addition, Perkins funds can be used to help teachers stay current with all aspects of an industry and can involve internship programs that provide relevant business experience. Any professional development requirements for CTE instructors in the benchmark states appear to focus mostly on academic and technical integration more than direct experience in a worksite with the intent of staying up-to-date on industry best practices.

How Does Maryland Compare?

While Maryland's CTE system is likely on par with many other states in the United States, it is clear that what is offered to students is unlike the structured, rigorous, industry-aligned training systems of the international top performers. With employers investing in and valuing CTE graduates, international programs are miles ahead of the United States. We challenge Maryland to think outside of the existing structure and Perkins funding silos and consider how business and postsecondary institutions might be engaged to reinvigorate CTE pathways that would serve both students and employers.

CTE Seen as a High-Quality Pathway with Both Employment and Post-Secondary Pathway Options for Graduates

Like many states, it appears that Maryland has some very strong career programs in place at some schools, serving some students. But with CTE students making up 21 percent of the graduating class of 2015, the system is not reaching students at a similar level as the international top performers. The state recently passed legislation requiring the State Board of Education to develop statewide goals so that by 2025, 45 percent of high school students will have successfully completed a CTE program, earned industry-recognized credentials, or completed a youth apprenticeship before graduating from high school. This is an ambitious goal. One word of caution is, in the push to expand CTE enrollment, that the focus stay on expanding high-quality CTE programs and closing down narrow vocational training that tracks students into low-wage jobs.

While 61 percent of CTE students graduate from high school having met the University System of Maryland

entrance requirements, that still leaves four in ten students out. And the average four-year public institution remediation rate in Maryland is 21 percent.⁵² We also know that one-quarter of CTE graduates do not successfully transition into postsecondary, advanced training, military service, or employment within a year of leaving high school. All these data show that the state could be doing more to expose all students to both rigorous academics and high-skill training to ensure that the pathways appeal to a broad cohort of students and that they transition successfully to employment or further education and training.

Training Available in a Wide Range of Attractive Careers

While Maryland has made efforts to introduce some new CTE programs tied to growth industries such as teaching, homeland security, and biomedical science, there are still cosmetology and barbering programs in place that do not offer students a chance to transition successfully into high-paying careers. Maryland would likely benefit from greater employer engagement to ensure that CTE programs are tightly aligned with industry needs in a broad mix of career areas. In addition, employers might have suggestions on how best to deliver technical training. Are the CTE Centers an effective model with students spending part of the school day at their home school and part of the day at the career center? Or would community college partnerships be more effective?

Students Receive Career Guidance and Counseling

Maryland reports that before grade 9 students are to develop an individual academic and career plan and update it in subsequent years. The Career Information Delivery Systems (CIDS) is

a tool available to students that provides self-assessments, career exploration resources, and a job bank. But this resource is not designed for youth and it is not clear how many districts are using it effectively. The ratio of counselors to high school students is 371:1 in the state, making it unlikely that the system provides comprehensive career counseling found in international systems.

Students Participate in Authentic Work-Based Learning Experiences

Maryland reports that work-based learning opportunities are made available to all CTE students, including internships, clinical experiences, industry-mentored projects or capstone projects. In the class of 2014, 53 percent of CTE students had completed work-based learning internships related to their CTE program of study. It would be worth learning more about the length of those internships and if students were given hands-on opportunities to apply their knowledge and skills.

The apprenticeship pilot program in Frederick and Washington County schools appears to be a promising approach to giving high school students exposure to high-skilled, high-growth manufacturing and STEM jobs.

Programs Lead to Industry Qualifications

Most of the more than 40 CTE programs offered around the state provide students with an opportunity to earn college credit, industry-recognized certifications, or both. But some of the programs, including Lodging Management, Cosmetology, Barbering, Fire Science, and Teacher Academy of Maryland only lead to the completion of state approved assessments which may not hold as much value in the workplace.

The good news is that more and more students are attempting and earning industry certification in recent years. It appears that the percentage of CTE high school students who earn industry credentials (77 percent) is actually greater than the percentage of CTE post-secondary students who do (47 percent).⁵³ Maryland might explore the dropoff at the college level, where typically students are more motivated and have greater options for earning certificates or credentials.

Qualifications Meet Global Standards and Are Reviewed on a Regular Basis

Maryland reports that schools are required by the State Department of Education to assess and regularly identify and create improvement programs for the weakest 20 percent of their CTE programs. We are not sure if this is actually accomplished and if the state in fact only reapproves CTE programs that tightly align with skills demanded by high-need, high-wage fields.

Teachers Kept Up-to-Date with Industry Best Practices

Maryland teachers are required to have a bachelor's degree in their field but not necessarily work experience. Continuing professional development requirements are minimal and while Maryland reports that the state is working with industry and post-secondary partners to bring professional development to CTE teachers, it is not entirely clear how many teachers have the opportunity to connect with businesses and stay up-to-date with industry best practices.

Recommendations for Maryland

Summarized below are the key features of the top-performing systems, the gap between Maryland and the top performers and the policies that

Maryland may wish to consider going forward to close that gap:

1. The top performers do not see CTE as the option for students who do poorly at academics. They see it as an option for students who do well at academics but who prefer a more applied form of education and who may want to start their careers without first obtaining a postsecondary education. Further, they see CTE as the route for all students who do not go on to postsecondary education, not just some of those who do not go on to a postsecondary education. This stance means that these countries set a high minimum goal for the academic achievement of all students, regardless of destination, typically to be achieved by most all students by the end of lower secondary school (that is, in American terms, by the end of the sophomore year of high school). That level of educational achievement is captured in a qualification that all students are expected to acquire before moving on to upper secondary education. CTE (in these other countries, VET) does not begin until the 10th grade, after achieving this first qualification. Because it is done that way, designers of VET programs can assume that the students taking the courses they design have already achieved a high level of literacy in the basic skills.

Maryland law requires CTE programs to lead to either an industry-recognized credential or to early college credit, which may appear to be much the same as the policies just described, but it is not. In practice, getting early college credit does not mean that the student is ready to succeed in a typical first year community college program,

and getting credit for taking a three course sequence in CTE is not the same as meeting an industry standard for beginning a rewarding career. These standards are very far apart. Adopting a qualifications system comparable to those found in the top-performing countries would be a dramatic change for Maryland. While there are good reasons why the state may still want to grant a diploma on the current terms, a system like this would amount to creating a second diploma, certifying that the student was ready to undertake a serious program of either CTE or academic preparation at the upper secondary level. In American terms, this level of readiness would also certify that the student is ready to succeed in the first year of an open admissions postsecondary program in the state system. We recommend that the state consider creating a qualifications system designed in this way.

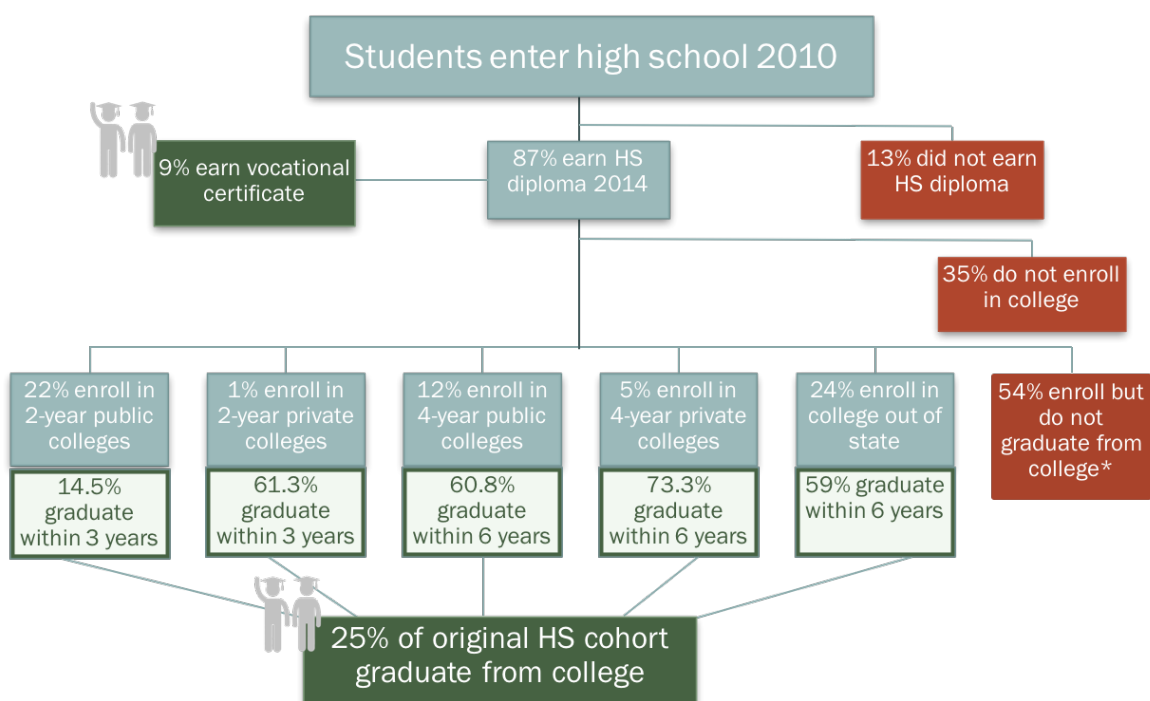
2. There is a very important difference between the goal for secondary school CTE in Maryland and the goal for secondary school VET in the top-performing countries. In Maryland, we were told, the primary goal is to provide students with a chance to explore career options at no cost to the student. In the top-performing countries, upper secondary school VET programs are designed to result in qualifications, which means that all high school students in the VET program are working toward an industry-recognized certificate that qualifies them for the first job in a career line. In the best systems, that qualification will also set the student on a path toward further education at the post-secondary level, which the student may pursue right after

high school or after being in the workforce. This difference in goals is fundamental. It explains why participation in CTE in the Maryland system means taking a series of three or more courses which probably will not result in an industry-recognized certification sufficient to qualify the holder to begin a career right after high school or for a serious program of continued education at the postsecondary level. It is also obviously true that high school students who are neither in an academic track nor in a CTE program will leave without a qualification that will enable them to begin a rewarding career.

The consequence of Maryland's policy for Maryland students is shown in the chart below. It

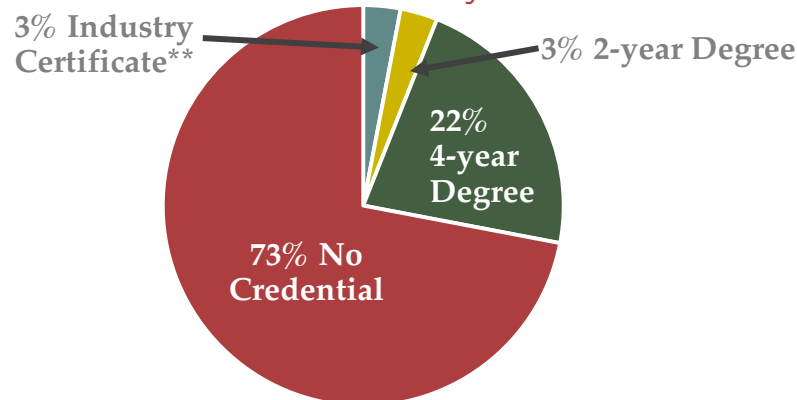
provides an estimate of the percentage of students leaving high school with a diploma and/or industry certification, then tracks student enrollment and earned degrees at the post-secondary level. Ultimately, only approximately 28 percent of the cohort of students entering high school in 2010 graduated from college. We recommend that Maryland consider redesigning its system so that all CTE programs are designed to result in industry-recognized qualifications certifying that students are ready to begin jobs leading to rewarding careers, and, at the same time, also certify that the students are ready to succeed in the first year of a Maryland community college program without remediation.

ESTIMATED MARYLAND SCHOOL SYSTEM RESULTS



*Within 3 years for 2-year colleges and within 6 years for 4-year colleges.

Estimate of the Percentage of Students Entering Maryland Schools
That Earn Post-Secondary Credentials*



*Within 3 years for 2-year colleges and within 6 years for 4-year colleges.

** Industry certificates granted from community colleges, four-year institutions, private career schools, and for-profit schools

3. To implement the preceding recommendation, Maryland would have to have a system of industry-recognized qualifications, with associated performance examinations, that covers the entire range of occupations not requiring a four-year college degree. We recommend that Maryland initiate a process intended to lead to the design and implementation of such a system, based on benchmarking the best such systems worldwide. We would recommend in particular looking closely at the Singaporean system for setting skill standards, because it is the only one we know of that is designed to set standards at the industry state-of-the-art rather than industry average practice, which can make a big difference in the quality and preparedness of the trained workforce and in the competitiveness of the Maryland economy.
4. The countries with the strongest CTE systems all have strong upper secondary VET systems that are closely aligned with their postsecondary VET systems. Massachusetts has one of the

strongest upper secondary CTE systems we have seen. Maryland may want to look closely at the Massachusetts secondary CTE system as a benchmark for taking the next step with its CTE work at that level. In both Singapore and Switzerland, the next step in the VET system beyond the upper secondary level is the polytechnic system in Singapore and the applied universities in Switzerland. In the United States, of course, the next step is community college. But the academic level of our community colleges is equivalent to the high school level in Singapore and Switzerland and the level of technical preparation in our community colleges varies widely.

We recommend that Maryland assemble a Study Group: a team of postsecondary system leaders from both the community colleges and the four-year universities, industry leaders, CTE leaders from the schools and state government, and members of the legislature to visit in both Singapore and Switzerland and to report back to the Maryland government and citizens with

recommendations for creating a world-class system of career and technical education in Maryland that will enable the majority of Maryland's students to acquire the skills needed in the years ahead to earn a good living and adjust rapidly to the rapid changes certain to take place as evolving digital technologies eliminate a growing number of jobs, especially those available to students who lack the basic skills or, increasingly, to those who have only those skills. These recommendations would include creating goals for its CTE system comparable to the goals set by the top-performing countries and a detailed plan for matching the performance of the top performers.

5. While Maryland's CTE programs include in some cases the possibility of serving as an intern in organizations providing opportunities for work-based learning, internships fall far short of true apprenticeships in providing the student/apprentice with the full range of opportunities to acquire all the skills needed to hit the ground running in highly technical jobs and many jobs requiring high initial levels of craft skills. Very few students in Maryland have access to apprenticeships that can be described in this way. Maryland should consider creating a system in the state, with regulated wages for apprentices, criteria for permitting firms to offer apprenticeships that are based on the criteria for earning the relevant qualifications, and the establishment by industry of industry associations that can offer the training that is required but individual firms cannot supply. We

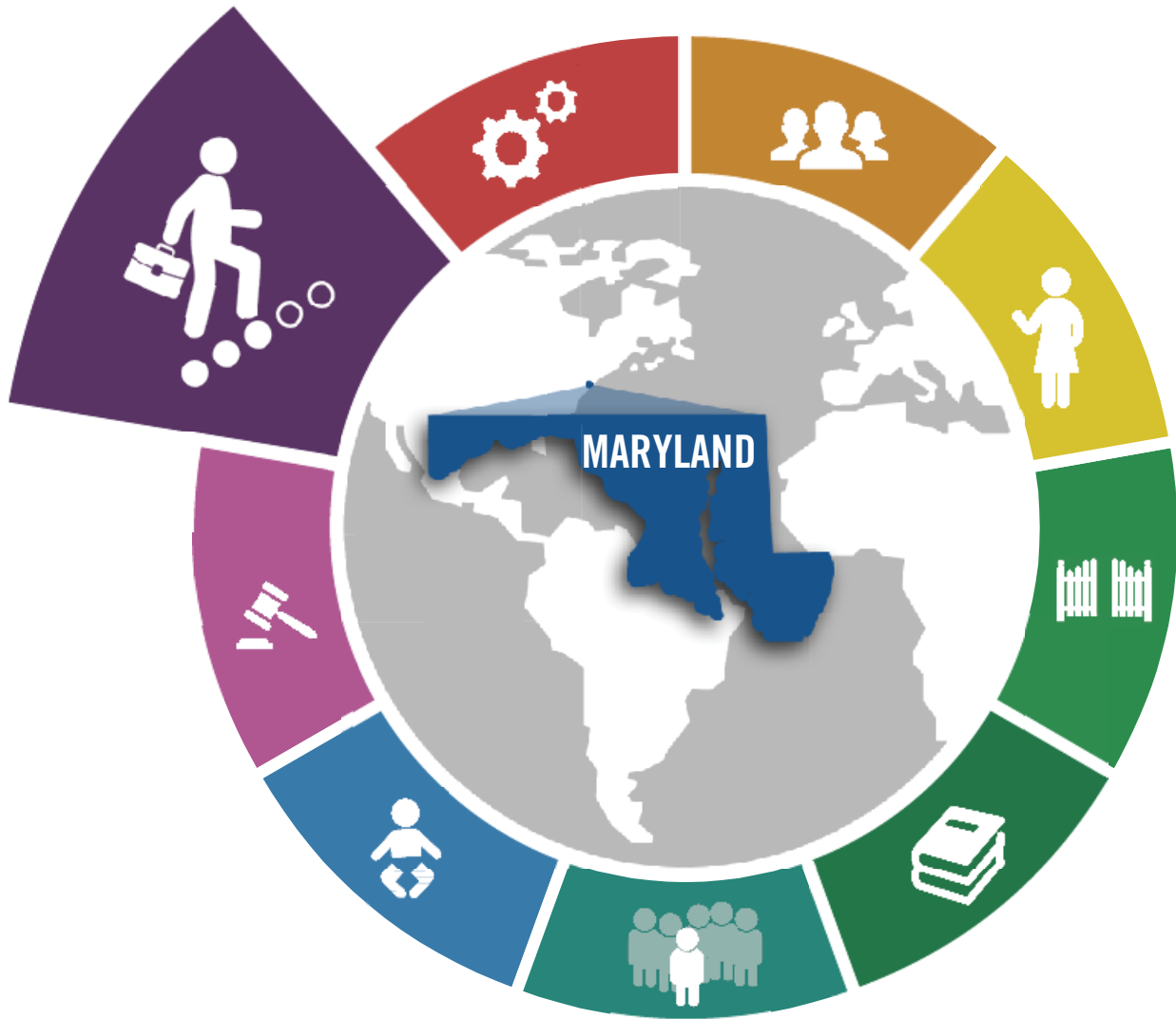
should note that Maryland has already set a target of getting 45 percent of high school students completing a CTE program, earning an industry-recognized credential or completing a youth apprenticeship program before graduation, but, as we pointed out above, completing a CTE program in most cases means nothing more than an opportunity to explore careers and does not necessarily involve acquiring the skills needed to begin a career in anything. There are very few apprenticeships available and very limited opportunities to get an industry-recognized credential in occupations leading to rewarding careers, so this requirement, while laudable in theory, is not very consequential in practice. If Maryland decides to create a commission of the sort recommended in the preceding recommendation, it should be charged with proposing a design to accomplish the goals just described.

6. We recommend that Maryland join the Pathways to Prosperity project that originated at Harvard University and is now being supported by Jobs for the Future. The Pathways project was designed to assist states in designing and implementing world class CTE programs by people who are intimately familiar with the global benchmarks in CTE, including the Singapore and Swiss systems. We recommend that Maryland become an active member of the Pathways state coalition and use the Harvard/JFF team to advise on implementation of the previous recommendations.

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BUILDING BLOCK 8



CREATE A LEADERSHIP DEVELOPMENT SYSTEM
THAT DEVELOPS LEADERS AT ALL LEVELS TO MANAGE SUCH
SYSTEMS EFFECTIVELY

The Benchmark

The global top performers all prioritize developing skilled principals who can ensure that their schools offer high quality and equitable learning opportunities to their students. They see them not simply as skilled managers and administrators but as the spear of their strategies to implement highly effective, complex and integrated strategies to greatly improve student performance and close gaps at scale. Perhaps most important, they see their principals as crucial to the selection, development and effective support of highly-qualified professional teachers. They know that, thinking about it that way, they need principals who are highly skilled at creating organizations in which true professionals can do their best work, moving from a blue-collar form of work organization to a form of organization that Peter Drucker once described as a place where “knowledge workers” could do what he called “knowledge work.” In the top-performing systems it is the principal who is responsible for setting very high expectations for both students and staff, recruiting and retaining highly effective teachers, organizing the work of teachers in teams that are responsible for constantly improving their own effectiveness and student performance using applied research. The top performers worldwide see school leaders not as administering a system designed and run centrally, but as designers of school organizations and programs themselves. The question is not how they can better respond to central office, but how central office can help them be more effective. The model of organization is not the early 20th century factory but rather the 21st century high-tech company. The workers are not interchangeable. Their

professional skills and knowledge are the key to success.

This requires principals to have a combination of wide-ranging knowledge and skills including instructional knowledge, patience, drive, management skill, ethical roots, moral qualities, and a strong command of what is known worldwide about managing professionals for high performance. Successful systems are designed to ensure an abundant supply of such principals. These systems design policies to ensure that they are: 1) attracting a high-quality pool entering the principalship, 2) training candidates to meet rigorous standards with a performance-based assessment at the end and supports when they first move into the position, and 3) retaining leaders through on-the-job support organized around ongoing learning, professional development, professional networks and a career ladder in education.

International Top Performers

Attracting a High-Quality Pool Entering the Principalship

Top-performing systems work hard to build a deep pool of candidates for principal positions by identifying early and grooming capable teachers who appear to have strong leadership potential. These candidates are purposefully recruited and may be offered a succession of progressively demanding opportunities to lead teacher teams in the school to build their skills. In general, future principals are not self-selecting like they typically are in the United States.

In all four top-performing international systems we benchmarked, principals must have been teachers themselves. This is not to say that being an effective teacher is

a sufficient prerequisite for being an effective school leader, but it is a necessary one.

In Finland, municipalities hire principals for their schools, and determine the minimum qualifications required. However, all municipalities require that candidates for principal qualification have a valid license to teach in the school they plan to lead and a track record of success as a teacher, along with their Certificate of Education Administration from the University of Jyväskylä Institute of Educational Leaders, which runs the national Principals' Preparation Programme. The Principals Preparation Programme lasts 1.5 years, and candidates complete it part-time while continuing to serve in schools. The requirement that all principals have teaching experience is especially important because in Finland, principals are typically expected to teach a minimum of two hours per week themselves.

On the other hand, in Ontario, the principal's role more closely resembles that of principals in the United States, where they do not typically teach. The province funds each school district annually to develop, execute and revisit a Board Leadership Development strategy. The goals of this strategic planning process are to develop succession planning protocols to identify schools where new principals will be needed and match them with ideal candidates, including both existing and aspiring principals, develop aspiring school leaders to meet the workforce needs of the province, and provide ongoing support and professional development to certified leaders who are taking on new assignments. All aspiring principals must have five years of classroom teaching

experience, an undergraduate degree, certification to teach in at least three levels of school (primary, junior, intermediate and secondary), two specialist additional qualifications or a master's degree (or one specialist qualification and half of the coursework for a master's degree), as well as a Principal Qualification from the Ontario College of Teachers. In addition, the province offers an Aspiring Leaders Program for vice principals and teachers interested in leadership, which pairs them with principal mentors and gives them practical training in leadership and management before they begin their pre-service experience.

In Shanghai, all principals must have been teachers and have reached one of the upper levels of Shanghai's 13-step educator career ladder. Teachers are promoted along this ladder, (described in more detail in Building Block 6), through a rigorous review process, which includes principal recommendations, research, portfolios of work and presentations to district review boards at key points on the ladder. Because of these experiences as teachers, aspiring leaders already have begun to develop their skills in training their peers in instructional strategies.

The strategy is similar in Singapore. Because all principals are promoted up through the educator career ladder described in Building Block 6, all principals first served as highly rated teachers, and then as assistant principals. Aspiring principals are carefully selected and groomed by senior leaders in the Ministry of Education. The educator career ladder has three main tracks, one of which is Leadership. A teacher who aspires to be a principal must be promoted along this track to subject or level head, head

of department and vice principal. Criteria used to promote a teacher along this track include annual performance appraisal, a professional portfolio, a district level panel review, recommendations from colleagues and supervisors as well as the results of a tool called “current estimated potential,” which estimates leadership potential and which is created early in an educator’s career and used in continuous professional development to guide training.

Training Candidates to Meet Rigorous Standards

The top-performing international systems take different approaches to training depending on their model of school leadership. In some cases, the principal has the job of expert instructional leader. In other cases, the principal is expected to create the conditions under which professionals can do their best work, but is not necessarily the expert in all functions in the school. In this case, senior master teachers take the instructional leadership role. In either scenario, principals need to be trained for the jobs they will assume. And all principals need to create spaces where teachers can collectively improve their craft, recognizing what good teaching looks like and how to build the capacity of teachers to meet that standard, and supporting teachers so that they can improve their skills and content knowledge. The top performers differ in the extent to which they believe that in order to do these things well, principals must be explicitly prepared in how to deeply understand good teaching themselves, including both the content and the delivery.

But whether top-performing systems focus on training aspiring leaders how

to be instructional leaders, how to manage teachers as professionals, or both, preparation always involves a clinical experience and mentoring by a successful school leader.

In Finland, it is assumed that principals’ past and ongoing work as teachers (school leaders teach part-time in Finland) will give them some baseline knowledge, skill, and perspective to establish effective collaborative working environments in the school. Formal training for leadership focuses on deepening these skills through observation of experienced principals, as well as learning about skills like financial management and interpreting education legislation that they may not have received as teachers. In order to earn the Certificate in Educational Administration, candidates must pass an exam that focuses on knowledge of legislation, municipal administration, finance, budgeting and human resources, which includes how to hire, develop, evaluate, compensate, and retain professionals. Coursework on managing professionals is often conducted via a field practicum with a cooperating school. The practicum consists of five field visits to a cooperating principal, each focused on a different aspect of the job. Student discussions are guided by “tutors” who are senior principals in Finland, many of who are working towards a doctorate degree in education. Candidates must develop and present a personal leadership philosophy, based on his or her research and experience in the program.

In Ontario, aspiring principals are prepared through the Principals’ Qualification Program, consisting of 250 hours of coursework plus a 60-hour practicum. The program is accredited by the Ontario College of

Teachers (also the primary teacher training body). The program content is organized around Ontario's Leadership Framework. About half of the course of study focuses on advanced leadership studies: how to design and manage the instructional program of a school. Focal points of the training include: "Developing People" and "Developing the Organization," both of which include elements of both management principles and how to manage professionals effectively. The Ontario College of Teachers provides a set of competencies that aspiring principals should master under each component of the framework. As part of the practicum, aspiring principals must propose a leadership project that they will undertake in their placement school: for example, developing a plan to support staff in making data-driven improvements to instruction. The participants are required to submit a final report on their project, detailing what they learned and how it made an impact on the school. In addition, the Ministry of Education fully funds mentoring for all Ontario principals in their first two years after graduation from a principal preparation program.

In Singapore, the National Institute of Education (NIE) sets out a framework for school leadership that its programs are structured around. The Leader Growth Model lays out six major domains of school leadership: ethical leader, educational leader, visionary leader, culture builder, change leader and network leader. NIE offers two major training programs for aspiring school leaders. The Management and Leadership in Schools Program prepares vice-principals, as well as other school leaders (head of department and subject and level heads), who are identified as having

leadership potential well before they become a principal with a 17-week program of study. The Leaders in Education program is required for all aspiring principals. It is a full-time, six-month program that is run by the National Institute of Education, which is also the nation's only teacher preparation program. In addition to the coursework, each participant is assigned a mentor for the duration of the program, completes a Creative Action Project (CAP), keeps a personal learning journal, and participates in a two-week overseas visit to learn from another education system. Most of the coursework is organized around case studies. Completers earn a qualification attesting that they have met all program objectives, successfully mastered the materials and completed their culminating project.

Shanghai is the only system that leaves principal training to the induction experience that starts within six months of a principal accepting a position. (Many of the various qualification programs in Shanghai may offer pre-service management courses but none of these are mandated.) Once on the job, new principals are required to have 300 hours of training experience. The Shanghai Municipal Education Commission accredits programs to offer this training, most of which are offered by district teacher colleges. All accredited programs must offer six modules: school development planning; optimization of internal management; fostering the teaching culture; leading curriculum and instruction; supporting teacher development; and adapting to the external environment. These modules build on Shanghai's Professional Standards for Compulsory School

Principals. Shanghai Normal University (SHNU) offers a “flagship” program to which each district sends particularly promising potential school leaders. At the SNHU program, each group of principals is assigned two mentors, one is an expert in school management and the other is a Master Principal, which is the highest level on the principal career ladder. The training is delivered through a combination of theoretical learning in the classroom and project-based learning based at the principal’s school. During training, principals in Shanghai are trained to lead and support Teaching and Research Groups at their school and to support the individual development of all teachers at their school.

Retaining Leaders Through On-the-Job Support Including Professional Development and a Career Ladder

Top-performing systems provide a range of supports to school leaders to ensure that they are continuously developing their skills and have opportunities to grow into new and more challenging roles. This often starts with giving new school principals access to a group of experienced peers and mentors who support them in their career growth, guide them toward professional learning opportunities aligned to their aspirations, and help them realize their personal goals and goals for the growth of their students and faculty. Principals are regularly given opportunities to visit other schools in their district, state or province, and even abroad in order to learn about successful practices and adapt their own leadership practices accordingly. This practice is intended to keep leaders learning continuously and to promote a benchmarking culture. Many top performers also have career

ladders for school leaders that provide incentives for increasing roles and responsibilities within their district, state or province.

All four jurisdictions give principals time and support for ongoing learning, along with incentives to participate in ongoing learning regularly. These incentives may sometimes take the form of mandates: a set number of hours of training that principals must complete annually in order to remain in good standing, for example. But more frequently, the top performers give increased pay, career ladder advancement, or the honor of a prestigious appointment to the principal training program in order to make participation in ongoing learning a reward, rather than an obligation.

Professional development for Finnish principals focuses on collaborative learning experiences, both within schools and between schools. Schools are organized into networks, and both principals and teachers regularly visit other schools within those networks to share best practices and brainstorm solutions to problems. This collaboration is not mandated, but is seen as an essential responsibility and ingredient for school improvement. A formal career ladder for school leaders does not exist. Evaluation of principals is left to school boards, which usually conduct an annual “discussion” with the principal to review job performance.

In Ontario, the Ontario College of Teachers provides many resources for the ongoing development of principals, including additional certifications in topics such as special education, education law, or mentoring, but there are few requirements for continuous

professional development.¹ There is no set number of hours of annual professional development that principals must complete to satisfy evaluation and/or recertification requirements. Principals are required to complete Annual Growth Plans (for high-performing principals) or Improvement Plans (for struggling principals). These plans must list professional development that will address the principal's areas of growth; their supervisors must approve it. A formal career ladder for school leaders does not exist. However, the Ontario College of Teachers does offer additional certifications that may make principals more competitive for desirable appointments or enable them to earn higher pay.

Both Singapore and Shanghai have more complex systems for incentivizing professional development, balancing both mandates and positive incentives. In Shanghai, in addition to the 300 hours of training principals receive within the first six months on the job, they must also complete 60 additional hours of professional development over five years in order to remain in good standing. This can include advanced professional degrees (including opportunities to study abroad for a master's degrees in Singapore). Getting the opportunity to participate in professional development above and beyond the requirements is considered an honor in Shanghai. The Shanghai Municipal Education Commission (similar to U.S. school district education agencies) honors 200 early and mid-career principals per year with the opportunity for special additional training and leadership development. Every five years, the Commission

selects 100 principals to be trained as "model principals" for the jurisdiction. These principals mentor their peers and coordinate their professional development, while being eligible to participate in international study groups. They receive 200 hours of training on advanced educational theories and research methods and are required to complete an advanced research paper within five months. Of these model principals, the Commission selects 10 to be "nation-wide principals," who serve as exemplars of good practice to the whole country, regularly modeling practices and speaking to their peers. Shanghai's principal career ladder is another way in which principals receive professional development, since principals receive different responsibilities and training as they advance up the rungs of the ladder.

In Singapore, the Academy of Principals is the professional body that provides professional learning for principals. It collaborates with the Ministry of Education, the National Institute of Education (NIE), and international groups to provide these opportunities, which may include workshops, collaborative professional learning communities, and study visits to other countries. The Academy also organizes a mentoring program that pairs first-year principals with experienced peers, and structures time for them to collaborate and share best practice. Although this program is technically voluntary, all new principals elect to participate. The Ministry of Education also rotates principals among schools, with principals typically serving in a school for four to eight years. This system is considered a primary component of principals' professional development, because principals are regularly

exposed to new school contexts throughout their careers. Cluster superintendents, themselves former principals, evaluate their principals using the Enhanced Performance Management System, working with the principal to set personal goals for improvement, and designing a professional learning plan that will help them meet their goals. A committee of district officials meets at the end of the year to review those that have met their goals and determines eligibility for bonuses and movement along the career ladder.

It is important to note that both Shanghai and Singapore, unlike other systems we benchmarked, have highly structured career ladders for their principals, not unlike those developed for their teachers. Like teachers, principals in Shanghai and Singapore advance along a ladder with time – although time is not the only factor that determines promotion. Positive performance on evaluations and the amount, quality, and relevance of professional development completed are factors as well. Therefore, participation in continuous learning results in leaders getting promotions more quickly, which in turn helps them earn additional pay and take on more advanced responsibilities.

At the core of this system is the idea that it is a key responsibility of management to identify people with real leadership potential, to give them many more opportunities to develop that potential by giving them a planned variety of assignments and, at the same time, the mentoring and skill building support needed to be successful in those assignments. It is often the case when visiting with especially impressive school leaders in these countries, we discover that they have been groomed for their positions

in this way for many years. One of the reasons that selection for high-level professional development in these countries is regarded as an honor is that it is usually a sign that the person selected is being groomed for more responsibility in the system. This is true, for example, of extended visits to other countries to help the trainee better understand the education systems of those countries and bring lessons from those countries to their own schools and districts, a leadership development strategy that is much more common in these countries than in the United States.

Top-Performing States

Attracting a High-Quality Pool Entering the Principalship

In general, in the United States, principals self-select instead of being recruited and groomed for leadership like they are in the top-performing international jurisdictions. Principals in the three benchmark states of Massachusetts, New Hampshire and New Jersey are not proactively identified, recruited or selected. Districts in the three states also generally do not have policies to identify teachers who they think would be effective leaders. While most come from the teaching ranks, there are no data specifying the exact percentage. New Hampshire requires five years of teaching experience. However, in New Jersey and Massachusetts, principal candidates need not have been teachers at all. Candidates can come from other professions and can substitute experience (in Massachusetts) or a master's degree in management or leadership (in New Jersey).

Training Candidates to Meet Rigorous Standards

For initial principal training, all three top-performing states have developed regulations that accredit principal preparation programs, define criteria to be accepted into principal mentorship and induction programs, and mandate that principals receive annual evaluations in order to remain in good standing. These regulations typically refer to standards written in the form of “Principals will be able to...” or “Principals will be prepared to be able to...” Massachusetts and New Hampshire include standards explicitly related to instructional leadership and effective management; New Jersey does not. However, the mechanism by which states monitor whether programs meet these standards is not clear to us, if there is one. It is also unclear what, if anything, states do to support or sanction programs or principals who do not meet them after they have first been accredited. Therefore, we cannot say with confidence that these states are ensuring that their principals meet the state standards.

The National Policy Board for Educational Administration released an updated set of seven Professional Standards for Education Leaders (formerly known as ISLLC standards) in 2015 that are designed to help states determine what quality licensure programs look like. Although these standards are not mandated nationwide, all three top-performing states have referenced these standards in their own regulations, suggesting that they are taken seriously as a roadmap for principal preparation. The Professional Standards for Educational Leaders contain 10 standards that focus on mission,

vision, and core values; ethics and professional norms; equity and cultural responsiveness; curriculum, instruction, and assessment; community of care and support for students; professional capacity of school personnel; professional community for teachers and staff; engagement of families and communities; operations and management; and school improvement.

However, variation exists across states regarding administrator licensure requirements. In Massachusetts, candidates must complete one of the following to earn an Initial Principal’s License: an approved post-baccalaureate program of study, an apprenticeship with a trained principal, or a panel review by experienced principals and district officials. They must also complete additional required coursework in educating English Language Learners in order to earn an endorsement in that area. In other words, a master’s degree is not necessarily required. After completing a preparation program, principal candidates take the Massachusetts Performance Assessment for Leaders (or PAL), which is comprised of four performance-based tasks that are designed to reflect the authentic work of school leaders and are based on the Professional Standards for Administrative Leadership described above. Those who complete a program and pass the assessment earn an initial license. Then, they must then complete a one-year internship with an experienced mentor and three years as a principal before earning a Professional License. Districts are responsible for organizing induction programs, but the state Department of Elementary and Secondary Education

sets standards that all induction programs must meet, including that they provide “adequate time for the mentor and beginning administrator to engage in professional conversations on learning and teaching.”

In New Jersey, principal candidates must secure a certificate of eligibility demonstrating that they have completed a preparation program and earned a passing score on the School Leaders Licensure Assessment. Programs are approved by the Department of Education Office of Licensure and Certification, using a set of Mentoring Program Standards as guidance for whether programs should be approved. These regulatory standards were adopted by the State Board of Education in 2005 and revised in 2015. The state has two stages of certification for administrative positions. An individual hired by a school district in a leadership capacity is granted a provisional license for two years provided he or she holds a master’s degree in curriculum and instruction, educational administration, management or leadership. He or she then must participate in a two-year principal residency program under the direction of a state-approved mentor. New Jersey has passed legislation that allows school districts to hire school leaders from outside the education field, provided they hold a master’s degree in management or leadership.

New Hampshire is the only state we surveyed that does not issue provisional or initial licenses: principals receive a professional license once they complete a principal preparation program (no exams are required to complete these programs). The state board approves preparation

programs, requiring that they submit evidence that they prepare candidates to meet a set of standards for principal effectiveness; candidates who are prepared at out-of-state institutions must submit a demonstration of their competencies (such as a professional reference). Regulations stipulate that principals must have master’s degrees in education leadership from an institution approved by the state board.

Finally, as the international top performers have shown, one necessary, but not sufficient, indicator of whether principals are prepared to be instructional leaders is whether they are required to have been highly rated classroom teachers themselves. New Hampshire requires that principals first have five years of experience as educators, but they are not required to submit evidence of their effectiveness in the classroom. Massachusetts and New Jersey actively recruit principal candidates from outside of education, and both states explicitly state that management experience can serve as a substitute for teaching experience.

Retaining Leaders Through On-the-Job Support Including Professional Development and a Career Ladder

In the United States, ongoing professional learning for school leaders is mandated, either through recertification requirements or evaluation systems. But it is not always strategically designed to fit with either individual principal development needs or on behalf of school improvement goals the way top international performers do.

Massachusetts ensures that principals are continuously developing throughout their careers through its principal evaluation system. The

School-Level Administrator Rubric defines the knowledge, skills and performance of effective principals, and district superintendents must use it to evaluate principals. All principals must complete an Individual Professional Development Plan that addresses the areas of growth identified in this evaluation. Furthermore, in order to remain in good standing, principals must receive 120 “Professional Development Points” over five years, which may include 10 hours per year of district-sponsored professional development. Principals in Massachusetts can participate in the National Institute for School Leadership’s (NISL) Executive Development Program (EDP) which includes training in instructional leadership, strategic thinking, team building and coaching, utilizing data, creating a just, fair, and caring culture, and aligning system elements. All participants complete an Action Learning Project (ALP), and participate in a leadership network. To date, NISL has trained over 1,500 school leaders in Massachusetts. Massachusetts’s teachers interested in leadership roles can also take courses offered by Teach21, a Massachusetts non-profit that offers training in coaching, mentoring and subject-specific content.

New Jersey requires school leaders to have an independent professional development plan that identifies professional development activities grounded in professional goals, annual performance evaluation results, and the district professional development plan. Because principals’ certificates are valid for life, there are no set professional development hours that are required for recertification. According to the 2016 draft of New Jersey’s state ESSA plan, the state

plans build out more training opportunities for principal coaches who support principals identified as in need of additional support by Achieve NJ, its statewide educator evaluation initiative.

New Hampshire is the only state we benchmarked that did not mandate ongoing learning for school leaders, either through state-level evaluation systems or state-level recertification requirements. That being said, local school districts can establish requirements for professional learning that principals must complete. District-level professional development committees lay out the formal activities the district offers to raise principals’ capacity in a professional development master plan. It is unclear if and how standards for these plans are monitored at the state level. In addition to local districts, the two principals’ unions, the New Hampshire Association of School Principals and New Hampshire School Administrators Association, offer ongoing professional development opportunities for principals seeking to meet local requirements.

Finally, no benchmark states have principal career ladder systems that provide incentives for ongoing learning and continuous improvement, such as those that exist in Singapore or Shanghai.

How Does Maryland Compare?

Attracting a High-Quality Pool Entering the Principalship

The top international performers strategically identify and recruit future principals, ensuring that they have a high-quality pipeline. Maryland, like other U.S. states, generally does not proactively identify

or recruit principals, instead relying on individuals to self-identify and enroll in a preparation program of his/her own choosing. However, one promising program is the Governor's Promising Principals Academy, started in 2014. Drawn from all 24 districts in the state, assistant principals are nominated by their superintendents for their leadership potential and interest in additional leadership responsibilities. The program identifies up to 48 candidates per year (in comparison to the projected 388 principal preparation program completers for 2016-17 who self-select). In another program of note, Prince George's County partnered with the National Institute for School Leadership (NISL) to develop an aspiring principal program that has a rigorous selection process in an effort to develop a talent pipeline for that district. To date, roughly 175 aspiring principals have been trained in Prince George's County.

In Maryland, aspiring principals must first meet the requirements of an assistant principal and then take a licensing test to move into the principalship. Becoming an assistant principal requires 27 months of teaching experience, a master's degree (in any area), and completion of an approved administrator certification program or 18 hours of graduate work in assessment, curriculum, development of staff, legal issues, management and leadership, and a practical experience. The principal preparation programs are not particularly selective and do not have a means for screening candidates to determine their leadership potential. In order to become certificated, principals are required to receive a relatively high score on the School Leaders Licensure Assessment

(SLLA), however this test is not performance-based like those used in many top-performing countries. A recent study found that the SLLA is not effective in predicting principal job performance.²

In sum, Maryland, unlike the top-performing international jurisdictions, is somewhat passive in its approach to securing high quality principal talent. Most principals self-select into the leadership role. In fact, based on the state's own analysis, there is currently an oversupply of principal candidates: Maryland staffing projections for principals included in its Teacher Staffing Report show 119 projected vacancies for the 2017-2018 school year and 388 projected candidates completing principal preparation programs in the state. As long as the state relies on principal candidates to self-select rather than being identified early for their leadership potential and recruited, this will continue to be a challenge.

Training Candidates to Meet Rigorous Standards

The top international performers require all future school leaders to complete a rigorous program of study that prepares them to be both instructional leaders and effective managers of teachers. This includes coursework and a practicum experience with the guidance and support of an experienced mentor.

Maryland has a process for approving principal preparation programs that requires them to demonstrate how they meet the Maryland Instructional Leadership Framework performance criteria. The framework is broadly organized around instructional leadership outcomes and evidence of practice in eight areas: School Vision; School Culture; Alignment of

Curriculum, Instruction, and Assessments; Instructional Practices; Appropriate Assessments; Technology and Multiple Sources of Data; Professional Development; and Engagement of Community Stakeholders. Criteria include:

- Demonstrating the skills and dispositions for sharing leadership and collaborative decision-making among stakeholders, especially teachers;
- Identifying and developing school leaders;
- Giving teachers opportunities to engage in collaborative planning and critical reflection during the regular school day; and
- Differentiating professional development according to career stages, needs of staff, and student performance

Maryland also requires districts to provide a one-year comprehensive induction program for new principals under the guidance of a mentor principal with a satisfactory or effective evaluation rating.

In sum, Maryland's approach to principal preparation is not nearly as rigorous or comprehensive as those of top-performing countries. As is typical in the United States, Maryland approves principal preparation programs but it is unclear how rigorous the approval process is and if the state has assurances that all programs are providing aspiring leaders with the kinds of immersive and rigorous training experiences they need to be effective in what is a very complex job. The state does require a one-year induction process for new principals, which is a good approach to giving principals guidance and support from an experienced mentor.

Retaining Leaders Through On-the-Job Support Including Professional Development and a Career Ladder

Top-performing international systems provide a series of ongoing supports and professional learning opportunities to school leaders to further their skills. These jurisdictions also often have principal career ladders in place with incentives for school leaders to take on more challenging assignments and new roles.

Maryland has a set of standards, the Professional Standards for Educational Leaders, which informs professional learning for principals. All principals are required to take six credits to renew their certificate every five years. Aspiring and current school leaders have the opportunity to participate in regional workshops offered by the Maryland State Department of Education that focus on teacher evaluation, student learning objectives, and other relevant topics in school leadership. According to the 2016 draft of Maryland's ESSA plan, starting in 2018 the state will reserve up to 3 percent of Title IIa funds for professional learning for principals, assistant principals, and teacher leaders, although this funding may be eliminated or reduced in the federal budgeting process.

But ensuring that principals are motivated and have clear goals for lifelong learning requires more than offering professional development. Development of formal career ladders in education creates the opportunity to use the possibility of career advancement to incentivize ongoing learning and growth and accomplish important state policy goals. In Shanghai and Singapore, for example, aspiring school leaders quickly learn

that advancement up the leadership career ladder depends in part on serving along the way in schools serving high proportions of low-income and minority students and on one's accomplishments in those schools. That policy produces a strong incentive for some of its most ambitious and able school leaders to serve in such schools and to do well there.

Maryland does not have a statewide career ladder system for principals. There is a pilot principal career ladder in place in Baltimore City, which allows leaders to move through four levels of achievement and development: standard, professional, transformational and distinguished. Through each pathway, principals take on more responsibility and earn greater pay and recognition through demonstrated strong outcomes, mentoring colleagues, or earning professional development credits. A career ladder would make the principal position more attractive if it provided a clear path to more responsibility, authority, status and compensation, as well as the support needed to move up the ladder.

In sum, Maryland does not appear to take a strategic approach to ensuring that its principals continuously improve with targeted professional development. Instead, school leaders are expected to complete professional development hours without much guidance, nor do they have organized support from supervisors or peers that might help them improve their practice. This approach to developing the skills and knowledge of school leaders, without a career ladder for guidance and support, is very different than what we see in top-performing international systems.

Recommendations for Maryland

Based on the above analysis of the leadership development systems of the international jurisdictions, the top-performing states, and Maryland we present the following recommendations:

Design an effective system to identify and develop school leaders to manage professionals

Maryland needs a systemic way of identifying principal talent. The state's Teacher Staffing Report does bring to light school leadership supply and demand issues for the state. Currently there is an oversupply of principal candidates completing preparation programs.

This is true nationwide and reflects the fact that increased pay for teachers typically depends on taking graduate level education courses. Many, if not most, teachers who take administrator training programs have no interest in or aptitude for school leadership, and no intention of applying for school leadership positions.

Not only is it true that many if not most students of school administration have no interest in going into school administration, but it is also true that they are typically not admitted to graduate level programs of school administration based on any formal assessment of their aptitude for school administration.

The top performers turned their attention to school leadership because they realized that their new strategies for raising the achievement of all their students could be realized unless they had a strong cadre of school leaders who understood those strategies and were fully capable of carrying them out.

Even if Maryland was doing a good job of systematically identifying, grooming, developing, mentoring and training education professionals for the school system as currently conceived, it would still need to do what the top performers have done, which is to design a leadership development process to support and indeed lead the implementation of the new design on the ground, so to speak, school by school.

This was, in essence, what Massachusetts did when it engaged the National Institute for School Leadership to train virtually all the principals in the state as the point of the spear in the implementation of the Massachusetts Education Reform Act.

Maryland may wish to consider doing something similar. But, if it does, it should think hard about ways in which it could use such a training program as a lever to change the face of school leadership training in Maryland, to fully integrate the training of school leaders in the state with the rest of a comprehensive plan for dramatically raising student performance and closing performance gaps. This is in fact what the top performers have done.

Build a career ladder for school leaders

The first step in such a program would be to do what Singapore and Shanghai have done, namely to build not only a state career ladder for teachers, but to build also a career ladder for school leaders as a branch of the career ladder for teachers. Such a career ladder would spell out the qualifications

needed to ascend the ladder step by step. That in turn would provide the specifications for a statewide training system for school leaders and therefore reframe the curriculum for the training of school leaders in the state's universities. At the same time, it would provide a ready-made framework for the certification of school principals and other school leaders.

Invest in teachers who show leadership potential and tie professional development to the career ladder

At the same time, the state could work with the school districts to help them develop systems for the early identification of teachers with high potential for leadership who could be groomed first for teacher leadership roles and then for leadership roles at the school and higher levels. In this way, money spent on professional development for leaders could be spent much more efficiently and with much greater effect.

Create incentives for strong school leaders to serve in struggling schools

The career ladder system for school leaders could be designed like those in Singapore and Shanghai so that school professionals interested in ascending the ladder would understand that their chances would be greatly improved by working in schools serving large fractions of disadvantaged youth.

The whole system would be designed to give school leaders not the skills to just keep school, but the skills needed to implement the kinds of systems that the top performers have used to enable their students to achieve at world-class level.

¹ Ontario College of Teachers (2014). Additional Qualifications.

² <http://www.aera.net/Newsroom/Recent-AERA-Research/Principal-Licensure-Exams-and-Future-Job-Performance-Evidence-from-the-School-Leaders-Licensure-Assessment>

BUILDING BLOCK 9



INSTITUTE A GOVERNANCE SYSTEM TO DEVELOP POWERFUL
POLICIES AND IMPLEMENT THEM AT SCALE

High-performing education systems have governance systems with the authority and legitimacy to develop coherent, powerful policies and are capable of implementing them at scale. This means that:

- roles and responsibilities are clear;
- there are shared goals across the system;
- progress towards these goals are clearly tracked; and
- there are ways to identify parts of the system that are not performing well and to provide effective help so that they improve.

This analysis briefly reviews these aspects of Maryland's governance structure and accountability system, compares Maryland to top-performing states in the United States and to the benchmark international jurisdictions, and then provides a set of recommendations for Maryland to consider.

Overview of Maryland's Education Governance Structures

Roles and responsibilities

Maryland's State Department of Education (MSDE) oversees pre-kindergarten to 12th grade, including career and technical education. The inclusion of early childhood education in MSDE is the result of a 2005 reform which was meant to better coordinate early childhood with the K-12 system. Maryland was one of the first states to do this, although it is now more common. The Department is accountable to the State Board of Education, which prepares draft agency budgets and sets education standards and graduation requirements.

Higher education is not overseen by MSDE, nor by any state agency. A Commission on Higher Education was created in 1988 to oversee the multiple parts of the state system and their respective governing bodies, including the Maryland Association for Community Colleges and the Board of Regents for the University System of Maryland. The Commission conducts strategic planning every four years to implement policy set by the Governor and the General Assembly. It is also empowered to oversee the higher education budget for the state and advise the Governor and Assembly on policy. The Commission is required to "coordinate" with the MSDE.

There are several other state-level boards — the Professional Standards and Teacher Board and the P20 Leadership Council — that also play oversight and coordination roles, but these roles often overlap with the MSDE and the State Board. The Professional Standards and Teacher Board sets standards for the education and certification of teachers and teacher education programs. The P20 Council was created as a partnership between the state education system and business leaders to ensure that Maryland students are prepared for jobs in a new economy.

Goal setting & strategic planning

Unlike top-performing international systems, Maryland does not have an agency or other authorized body that is responsible for connecting the goals of the education system to the economic development objectives of the state. Maryland's State Department of Education (MSDE) has a set of goals — close the achievement gap, increase college and career readiness, reduce the need for remediation, attract and develop great educators, support a fair

system of evaluation, turn around the lowest-performing schools, and expand high-quality school models — but these goals do not have a set of benchmarks against which to measure progress, and it is not clear the extent to which they have been developed with input across agencies or with input from the public. Several other parts of the education system have strategic planning processes — including MSDE’s ESSA planning groups, the Commission on Higher Education, and the P20 Leadership Council. A mechanism to coordinate these plans across systems would help to improve system efficiency and reduce duplication where it exists. Maryland also has a planning process within the Department of Education put in place by the Bridge to Excellence in Public Schools Act. This process requires local school systems to create “master plans” that show how they will allocate their funds to raise student achievement for all groups of students, include at-risk populations. The Secretary must approve these plans annually and the Department of Education monitors whether local systems achieve their objectives. This is a commendable process, but different from a statewide plan with statewide goals. In addition, a systematic process for collecting public and private sector input into this planning would help build public understanding of and support for the system. This type of outreach did occur in the recent ESSA planning process, which was required by the federal government.

Tracking performance

Maryland has K-12 report cards which provide state, county and school-level data on results for indicators of performance, demographics, state tests, graduation rates and college enrollment. The state also has the Maryland Longitudinal Data System which was

established in 2010 for the express purpose of generating information about education performance that could be used to improve the system. It notably produces the annual state staffing report which is one of the most advanced systems in the country for analyzing teacher demand. Yet the state does not seem to be making use of this system to track major measures of system-level progress, such as the percent of students who enter high school and graduate on-time with a post-secondary degree or using the teacher demand information while accounting for teacher supply.

How Does Maryland Compare on Governance?

Benchmark states

Maryland’s governance structures are typical of many states in the United States. It is among only a handful that have integrated early childhood education into its education system, with the purpose of ensuring a better continuity of service. Like many other states, the lines of authority between and among agencies and commissions overseeing the education system are not completely clear. New Jersey and Massachusetts both include early childhood under the umbrella of their education department and have higher education overseen by separate state agencies. Of the benchmark states, only New Hampshire has invested responsibility for all key parts of the education system within the state education agency. This is likely because it is a such a small state. The fact that it allows a much greater level of local discretion in implementing policies than is typical of most states likely means that policies are still not always aligned and coordinated at the state level. Massachusetts notably has a state Executive Office of Education reporting

to the Governor with a mission to coordinate policy among the various agencies and commissions in the state.

Like Maryland, most states have broad goal statements outlining what they want their students to know and be able to do and state strategies to help districts, schools and teachers meet these objectives, but there is often no strategic planning process to set benchmarks to measure progress and little to no alignment with the goals in the states' ESSA plans and other strategic plans across and within state agencies or other authorized state bodies. Massachusetts again is a notable exception. While there is no cross-agency broad strategic planning process in that state, the Massachusetts Department of Elementary and Secondary Education has a strategic planning process with state-wide benchmarks that are measured annually and after five years.

International jurisdictions

The international jurisdictions differ from the United States in that their education governance is generally more centralized in a national or provincial ministry that oversees all parts of the education system. Singapore and Finland each have a national education ministry whereas Shanghai and Ontario have similar structures at the provincial level. The one exception to central governance is in Ontario where higher education is overseen by a separate Ministry of Advanced Education and Skills Development. It is not just the scope of oversight that is different, however. It is also that all four international jurisdictions set national or provincial frameworks for the systems, with national and provincial standards, curriculum frameworks across all subjects, syllabi and assessments. They also all oversee teacher education and

development and licensing. The scope of their authority allows an alignment of policies that is rare in the United States.

What is also distinctive about all four international jurisdictions is that they all have a broad strategic plan for education with agreed-upon benchmarks to measure progress. These plans are reviewed on a regular basis and are developed with public input as well as input from a range of public and private sector partners. Shanghai, for example, creates provincial-level 10-year education plans based on the famous national Chinese 10-year plans. Ontario's education ministry has also done this, in partnership with the teacher's unions in the province. Its plan and goals have been updated regularly. Singapore notably organized broad public "conversations" about education and other policy goals. The latest "National Conversation" gathered input on a vision for the country's economy and its education system going through 2030. These outreach strategies build public support and understanding about the education system and help sustain an agenda through changes in system and political leadership.

Overview of Maryland's Accountability System

School accountability

Maryland, like all other states, is revamping its state school accountability system as required by the Every Student Succeeds Act (ESSA) of 2015. Under ESSA, each state must have an accountability system for schools that is based on five indicators: 1) proficiency on assessments; 2) growth in proficiency in elementary and middle school or another academic indicator; 3) high school graduation rate; 4) progress of English language learners (ELL) towards proficiency; and 5) a non-

academic indicator of school quality or success. Each state sets its own proficiency level. Maryland's legislature passed the Protect Our Schools Act in 2017, which laid out an additional set of requirements. Specifically, it required that the state's system:

- Include at least three measures of school quality, one of which must be a school climate survey;
- Include access to or credit for a well-rounded curriculum indicative of on-track progress at key transition points at elementary and secondary school as an academic indicator;
- Create a composite score including academic and non-academic indicators that must not weight academic indicators more than 65 percent; and
- Weight each academic indicator and non-academic indicator at least 10 percent.

The proposed new accountability system in the state's ESSA would be reported using a five-star rating system based on a composite score. The composite score is calculated by combining the academic and non-academic indicators.

The academic indicators are 65 percent of the composite scores and include:

- Academic achievement: 25 percent for elementary, middle and high school
- ELL academic proficiency: 10 percent for elementary, middle and high school
- Other academic for elementary and middle school is:
 - 25 percent for academic growth
 - 10 percent for completion of a well-rounded curriculum

- Other academic for high school is:
 - 15 percent for graduation rate
 - 10 percent for on track for 9th grade
 - 10 percent for completion of a well-rounded curriculum

The school quality (non-academic indicators) are 35 percent of the score. For elementary, middle and high school, they are:

- 15 percent for chronic absenteeism
- 10 percent for school climate
- 10 percent opportunities/ access to a well-rounded curriculum

The state is also required to set both long and short-term goals for schools. Maryland's long term goal is to reduce by 50 percent the number of students not proficient, including ELL students, by 2030 and raise the four-year high school graduation rate to 88.5 and the five-year rate to 90 percent by 2020. Maryland defines proficiency as a 4 or 5 on required PARCC exams.

In addition, ESSA requires states to identify low-performing schools for two types of support: Comprehensive Support and Improvement (CSI) and Targeted Support and Improvement (TSI). States must establish a methodology for identifying CSI schools that includes:

- The lowest-performing 5 percent of Title I schools
- High schools with graduation rates of less than 67 percent
- Schools with one or more subgroups performing below the lowest 5 percent and failing to improve after three years
- Other state-specified criteria

Maryland's has defined their additional criteria for identifying CSI schools to include the lowest 5 percent of all schools, not just Title I schools.

TSI schools are those with persistently underperforming subgroups. Specifically, states must identify schools with one or more subgroups performing the same as or worse than the lowest-performing Title I schools or not meeting their targets for two or more consecutive years.

Based on Maryland's ESSA plan, each district with comprehensive support schools will receive an on-site visit from state officials to assess district staff capacity and fiscal responsibility. Available resources for technical assistance include MSDE's online performance management system to manage school improvement efforts, including intervention plans, budgets, data tracking and support and monitoring.

Teacher and principal accountability

Maryland requires that districts evaluate teachers and principals annually and lays out a framework for doing so, which districts can then adapt. The framework specifies that for teacher evaluation, both professional practices (measured by at least two classroom observations) and student growth (to be measured by PARCC starting in 2017) each account for "significant" components of the evaluation results. Districts can adapt the framework from there: they can assign slightly different weights to student learning outcomes, set slightly different cut scores, and determine the rewards or sanctions associated with different levels of evaluation. Principals' evaluations are slightly more centralized at the state level: they must be evaluated specifically on the Maryland

Instructional Leadership Framework domains, and several outcomes developed by the Interstate School Leaders and Licensure Consortium.

Teacher education accountability

The State Board of Education is responsible for setting the standards and general guidelines for approval of teacher preparation institutions, while the State Department of Education, with the advice of the 25-member Professional Standards and Teacher Education Board, manages the process of oversight, periodic program reviews (every five to seven years, depending on the quality of the program's previous review), approval and reaccreditation. All schools must collect data on a variety of indicators (e.g., "on average, 80 percent of institutions' graduates must pass the Praxis"; "institutions can provide evidence that its graduates possess skills aligned with the Maryland College and Career Ready Standards," etc.) in order to prepare for their reaccreditation. The State Board has not used its authority to raise the bar for entry into teacher education or certification of teachers into the profession.

How Does Maryland Compare on Accountability?

Benchmark states

Maryland's accountability system is similar to that of other states, as they all are designed to meet the ESSA guidelines. The Maryland system diverges from the other benchmark states in a few areas, however.

School accountability:

- The weighting of academic and non-academic indicators is very different in Maryland than in the benchmark states. Maryland weights academic indicators at 65 percent of the

composite score, whereas both Massachusetts and New Jersey weight these indicators at 90 and 92.5 percent. New Hampshire's weights have not been specified. Maryland's weight is also the lowest among the broader group of all states that have submitted their plans, with Iowa's 74 percent weight the next lowest. For high schools, this means that the graduation rate is weighted much lower in Maryland than in other states.

- Maryland's long range goal for its schools of reducing students not meeting expectations by half by 2030 is different from the benchmark states. Given that roughly 25 to 40 percent of Maryland students now meet or exceed expectations, depending on the subject and grade level, this means that the state's goal is ultimately up to 70 percent proficiency. New Jersey's goal of 80 percent proficiency for all students is the most ambitious of the benchmark states, and far more ambitious than most states. New Hampshire is notable in setting a goal of post-secondary certification as the goal of its schools, making the goal of the

system not just doing well on high school tests but ensuring that students succeed after high school.

- Maryland and Massachusetts are the only two of the benchmark states to include a measure of 9th graders being on track as part of school accountability. This seems key in making progress on student success in high school.
- In addition, Maryland, along with New Hampshire, includes college and career readiness in its accountability systems. For Maryland, it is part of its academic achievement measure. For New Hampshire, it is its only measure of school quality and student success. The Massachusetts school quality measure is different: it is focused on the percent of students who complete advanced coursework like AP, IB and dual enrollment options only. Massachusetts has defined a core curriculum that certifies college and career readiness but this is not part of its ESSA accountability system. New Jersey does not include a college and career readiness measure in its system either

Chart 1: How States Compare on Goal Statements
For School Accountability from ESSA Plans

State	Goal: Academic Achievement	Goal: Graduation Rate	Goal: English Language Proficiency
MA	Reduce the proficiency gap by one-third over the next six years for all student subgroups in all subjects on Next-Gen MCAS	Increase overall and subgroup four-year graduation rates by 5 percentage points and reduce the graduation gap for all student subgroups by 29 percent by 2020	Reduce students not making satisfactory progress toward proficiency (calculated using an algorithm set by the ACCESS exam) by 50 percent by 2022.
NH	65% of 25-63 year olds have a high quality post-secondary credential by 2025; 74 percent proficiency in English and 54 percent proficiency in mathematics by 2025 for all students (SBAC Level 3 or higher), or proficient on the Performance Assessment for Competency Education (PACE).	Four-year graduation rate of 93 percent by 2025	Did not set a goal yet because baseline data does not exist
NJ	By 2030, have 80 percent of all students and subgroups meet or exceed expectations on PARCC (4 or 5 score)	95 percent four-year adjusted cohort graduation rate for all students and subgroups by 2030	By 2023, 86 percent of English learners will achieve satisfactory progress toward proficiency (defined as a composite score of 4.5 on ACCESS assessment)
MD	Reduce by half the number of students who are not meeting expectations by 2030 (4 or 5 on PARCC)	4-year graduation rate of 88.5% and a 5-year graduation rate of 90% by 2020	Reduce by half the number of students not reaching proficiency (defined as a score of 5.0 on ACCESS assessment) within 6 years by 2030

Chart 2: Top-Performing States and Maryland: School Accountability
Academic and Non-Academic Indicators in ESSA Plans

State	Level	Academic/Test-Focused	Non-Academic/Non-Test-Focused
MD (NOTE: Plan is in draft form and has not yet been submitted) Schools would be rated on a five-star scale.	Elementary/Middle School	Total Weight: 65% Academic Achievement (20%): proficiency rates on PARCC ELA and mathematics (4 or 5) Academic Progress (35%): <ul style="list-style-type: none"> • Growth in ELA and mathematics (25%); • Credit for completion of a well-rounded curriculum (10%): percentage of 5th or 8th grade students earning passing grades in social studies, fine arts, physical education and health, and passing MISA in science English Language Proficiency Progress (10%)	Total Weight: 35% School Quality or Student Success (35%): <ul style="list-style-type: none"> • Chronic absenteeism (15%); • Climate survey (10%); • Access to a well-rounded curriculum (10%): percentage of 5th or 8th grade students enrolled in science, social studies, fine arts, physical education, health and, for middle school only, computational learning
	High School	Total Weight: 65% Academic Achievement (20%): proficiency rates on PARCC ELA and mathematics (4 or 5) English Language Proficiency Progress (10%) Readiness for Postsecondary Success (20%): <ul style="list-style-type: none"> • On-track in 9th grade (10%); • Credit for completion of a well-rounded curriculum (10%): percentage of students graduating with one of the following: <ul style="list-style-type: none"> ○ AP score of 3 or higher, ○ IB score of 4 or higher, ○ SAT math score of 530+ and reading score of 480+, ○ ACT composite score of 21 or higher, ○ Dual enrollment credit, ○ Meeting University of Maryland entry requirements, ○ CTE industry certification, ○ Minimum score on ASVAB. Graduation Rate (15%)	Total Weight: 35% School Quality or Student Success (35%): <ul style="list-style-type: none"> • Chronic absenteeism (15%); • Climate survey (10%); • Access to a well-rounded curriculum (10%): percentage of students graduating who: <ul style="list-style-type: none"> ○ Enrolled in an AP or IB course, ○ Enrolled in dual enrollment, ○ Completed a CTE concentration.

State	Level	Academic/Test-Focused	Non-Academic/Non-Test-Focused
<p>MA</p> <p>Based on an index of 1-100, a school would fall into one of six performance tiers.</p>	Elementary/ Middle School with Measurable English Learner Group	Total Weight: 95% Academic Achievement (60%) Academic Progress (25%) English Language Proficiency (10%)	Total Weight: 5% School Quality or Student Success (5%): Chronic absenteeism
	Elementary/ Middle School without Measurable English Learner Group	Total Weight: 95% Academic Achievement (70%) Academic Progress (25%)	Total Weight: 5% School Quality or Student Success (5%): Chronic absenteeism
	High School with Measurable English Learner Group	Total Weight: 92.5% Academic Achievement (50%): Grade 10 ELA, math and science Next-Gen MCAS Academic Progress (20%) English Language Proficiency (5%) Graduation Rate (17.5%)	Total Weight: 7.5% School Quality or Student Success (7.5%) <ul style="list-style-type: none"> Chronic absenteeism; Success in grade 9 courses; Successful completion of “broad and challenging coursework” (measured as percentage of students successfully completing AP, IB, or Honors courses)
	High School without Measurable English Learner Group	Total Weight: 92.5% Academic Achievement (50%): Grade 10 ELA, mathematics and science Next-Gen MCAS Academic Progress (25%) Graduation Rate (17.5%)	Total Weight: 7.5% School Quality or Student Success (7.5%): <ul style="list-style-type: none"> Chronic absenteeism; Success in grade 9 courses; Successful completion of “broad and challenging coursework” (measured as percentage of students successfully completing AP, IB, or Honors courses)

State	Level	Academic/Test-Focused	Non-Academic/Non-Test-Focused
NH (NOTE: Plan is in draft form and has not yet been submitted.) All indicators will be reported on an index scale of 1-4	Elementary/ Middle School	Weights not yet specified Academic Achievement: Smarter Balanced and PACE (NH competency assessment) performance levels will be reported on a scale of Levels 1-4 Academic Progress English Language Proficiency Progress School Quality or Student Success: Mean Student Growth Percentile (MGP) for the lowest-achieving quartile of students, reported on a scale of Levels 1-4	None: All elementary and middle school measures are based in test scores.
	High School	Weights not yet specified Academic Achievement: SAT and PACE performance levels will be reported on a scale of Levels 1-4 English Language Proficiency Progress Graduation Rate School Quality or Student Success: Career Readiness (CCR): Graduating seniors achieve CCR if they meet two of: <ul style="list-style-type: none"> • NH Scholars Standard, STEM or Arts program of study; • Grade of C or better in dual-enrollment course; SAT scores at or above CCR benchmark; • ACT scores at or above CCR benchmark; • AP exam score of 3, 4, or 5; • IB exam score of 3, 4, or 5; • CTE industry-recognized credential; • NH career pathway program of study; AFQT score of Level III 	<ul style="list-style-type: none"> • None: All high school measures are based in test scores.
NJ New Jersey's plan would use a summative score, which represents a percentile rank, to rate schools.	Elementary/ Middle School	Total Weight: 90% Academic Achievement (30%): Proficiency on PARCC in ELA and mathematics (Levels 4 and 5) Academic Progress (40%): English Language Proficiency Progress (20%)	Total Weight: 10% School Quality or Student Success (10%): Chronic absenteeism
	High School	Total Weight: 90% Academic Achievement (30%): Proficiency rates on PARCC in ELA and mathematics (grades 3-10) English Language Proficiency Progress (20%) Graduation Rate (40%)	Total Weight: 10% School Quality or Student Success (10%): Chronic absenteeism

Teacher and principal accountability:

- Maryland, like New Hampshire, provides an evaluation framework for teachers and principals that districts must use to design their own evaluation systems. Massachusetts and New Jersey have statewide evaluation systems. All four systems use both teacher observations and student growth on standardized tests as components of the evaluation, but the weights are not specified in the evaluation frameworks in Maryland and New Hampshire. Student achievement is weighted at 30 percent in New Jersey and 50 percent in Massachusetts. In general, the focus of evaluation is on continuous improvement, with teachers using evaluation results to set goals for their own professional learning, but in each of these systems, teachers can lose their jobs as a result of persistently poor evaluation results.
- Although states are not required to identify districts for targeted support under ESSA, Massachusetts, New Jersey and Maryland identify districts with high numbers of underperforming schools and provide them with targeted professional learning opportunities. The level of support provided is most articulated and comprehensive in Massachusetts, where the best-performing districts are granted considerable autonomy to innovate, and the lowest-performing are put into receivership by the state.

For teacher education:

- All the states studied have a statewide body responsible for teacher preparation program approval. Reaccreditation takes place every five to seven years. Historically, almost all programs are

reapproved. Massachusetts, New Jersey, and New Hampshire have recently proposed ways to begin making the program approval process more rigorous: tying teacher candidates' performance on exit assessments to program approval in Massachusetts, ensuring that programs provide sustained clinical experiences with diverse populations as a condition of program approval in Maryland, and launching a statewide report card with a range of indicators for teacher preparation programs in New Jersey.

Benchmark international jurisdictions

The accountability systems in the international jurisdictions are markedly different from those in any U.S. state. In general, they are much less mechanistic: none of the systems have such detailed formulas for exactly how teacher, school leader or school quality is measured. And none rely primarily, or to such a large extent, on test scores. Instead, they provide supports for teachers and school leaders who lack experience and to schools that are not high performing. For teachers and school leaders, the accountability system is tied to the national career ladder, in jurisdictions where those exists. This is the case in Singapore and Shanghai. Support is often done by formally or informally relying on master teachers and school leaders for mentoring. New teachers have multiple years of mentoring in Singapore, Shanghai and Ontario. In Shanghai and Singapore, highly experienced school leaders mentor school leaders of struggling schools. In addition, there is much less focus on identifying individuals who are "low-performing" as so much of school organization and management relies on collaboration among teachers. Teachers are assessed on how well they help their peers succeed or contribute to the

improvement of the whole school. Schools with high concentrations of struggling students are given extra teachers and the most experienced teachers. As mentioned in the analysis for Building Block 5, helping struggling schools improve helps teachers and school leaders advance in their careers.

In addition, teacher education is much more tightly controlled in the international jurisdictions. As described in Building Block 5, teacher preparation programs are held to rigorous standards for program content, the quality of instruction, and criteria for entering and exiting the programs. International jurisdictions can and do exercise their authority for program approval to control for quality, such as when Finland closed all of its teacher preparation programs and reopened them in just eight research universities. Furthermore, they use province or nationwide policy to set and update requirements for program content, such as when Ontario doubled the length of the required practicum to 80 days for all candidates.

Recommendations for Maryland

1. Create a **unified education strategic plan** for the state that crosses agencies and is informed by the public and private sector partners, which also includes an agreed-upon set of goals and measurable benchmarks to assess progress toward these goals. As part of this strategic plan, it should be clear which partners are responsible for different parts of the agenda.
2. If the agreed-upon goal of the education plan is to make students career and college ready, then the state should agree on a widely shared common understanding of what this is. The state should develop a communications strategy to describe this **definition of college and career readiness** and its importance to partners. Doing so would establish its importance to the state.
3. This **definition of college and career readiness, and the benchmarks used to measure it, should be the focus of the state's accountability system.** Maryland should revisit aspects of the accountability system, including the school rating system, educator evaluation, and student graduation requirements, in light of this definition, and align them. In addition, the state should ensure that any career ladder system for educators that is developed is helps educators meet the goals is this plan.
4. If all the partners agree that a key to achieving college and career readiness for all Maryland students is **high-quality teachers and school leaders**, Maryland's agencies in charge of educator licensure, and/or the legislature, should use their authority to raise the entry requirements to the profession and insist that teacher education measure itself against a common set of program standards.
5. In addition, Maryland should **connect continuous improvement for educators to the skill sets identified on the career ladder** to better systematize and raise the impact of professional development expenditures across the state.
6. Maryland should be rigorous in its **quality assurance role in terms of closing equity gaps** in performance for students. The state can take advantage of the requirement in ESSA to review resource allocation in terms of equity and use this information to assess the effectiveness of specific interventions for at-risk populations.



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