Commission on Innovation and Excellence in Education
William E. Kirwan, Chair

Agenda
January 9, 2017
1:00 p.m.-5:00 p.m.
120 House Office Building, Annapolis, Maryland

I.   Chair's Opening Remarks

II.   Teacher Quality Systems in Top Performing Countries

- Linda Darling-Hammond, President and CEO, Learning Policy Institute

III.   Quality Teacher Preparation Programs

- Robert Rickenbrode, Senior Managing Director of Teacher Preparation Strategies, National Council on Teacher Quality (NCTQ)

IV.   Moderated Discussion of High Quality Teaching

- Marc Tucker, President, National Center on Education and the Economy, Moderator
- Linda Darling-Hammond, Learning Policy Institute
- Robert Rickenbrode, NCTQ

V.   Adequacy of Education Funding Since 2002

- Rachel Hise, Lead Principal Analyst, Department of Legislative Services (DLS)
- Scott Gates, Senior Analyst, DLS

VI.   Overview of Maryland Benchmarking and Gap Analysis Process

- Marc Tucker, President, National Center on Education and the Economy (NCEE)
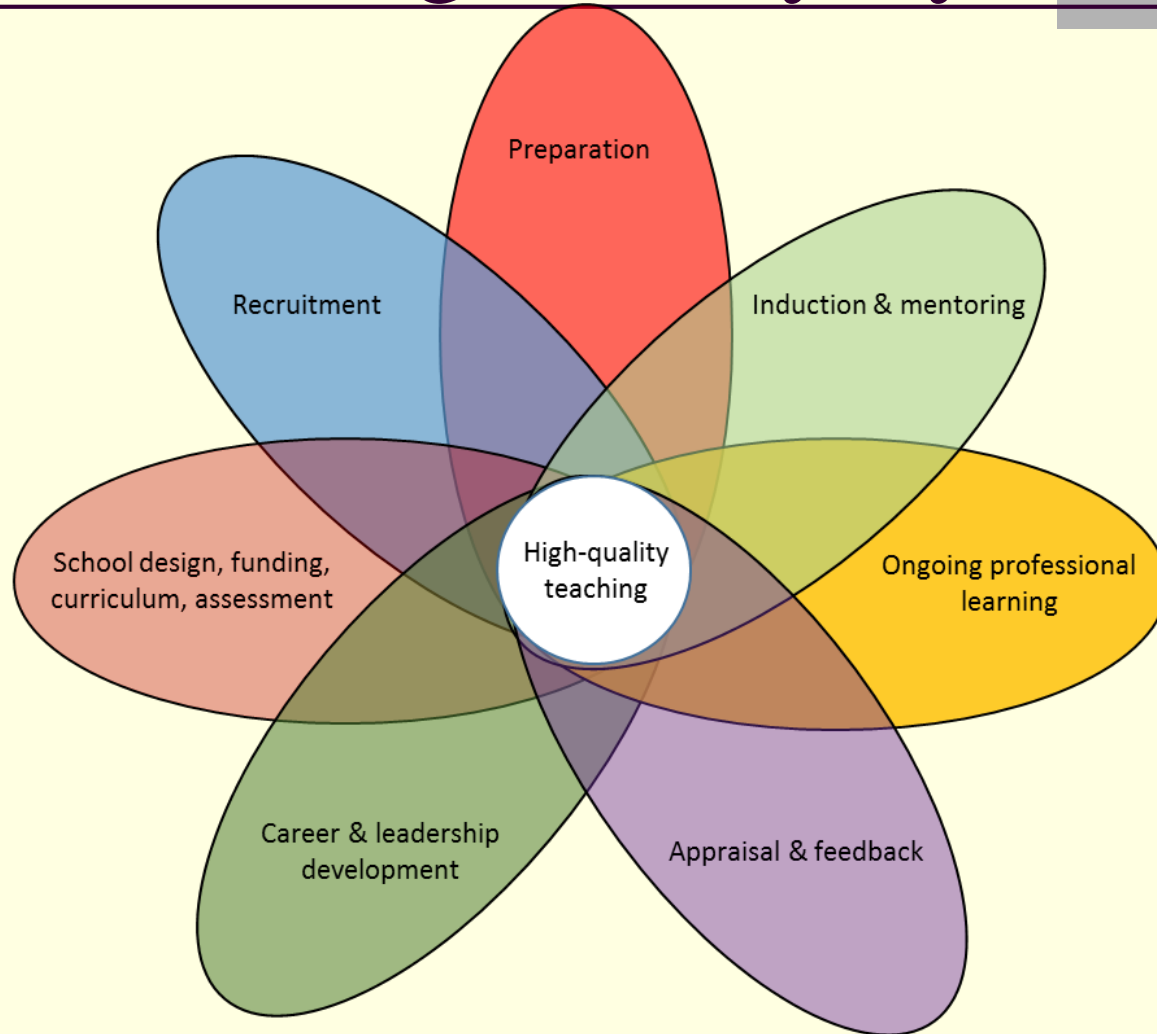- Betsy Brown Ruzzi, Vice President, NCEE

VII.   Discussion of 2017 Draft Work Plan/Schedule

VIII. Chair's Closing Remarks and Adjournment

Building Education Systems for Quality and Equity:
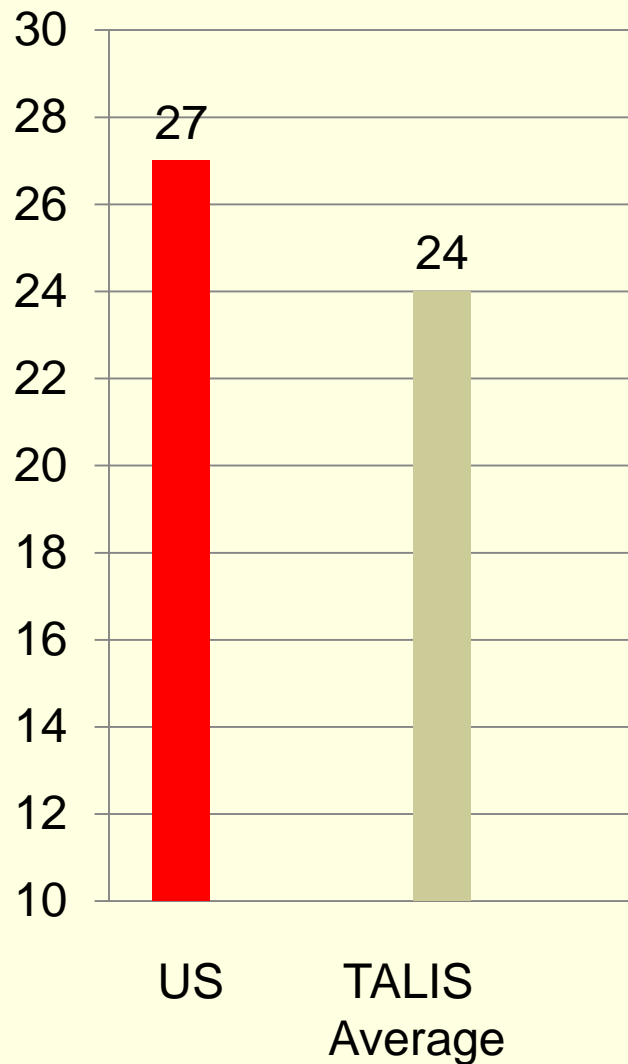## Lessons from Around the World

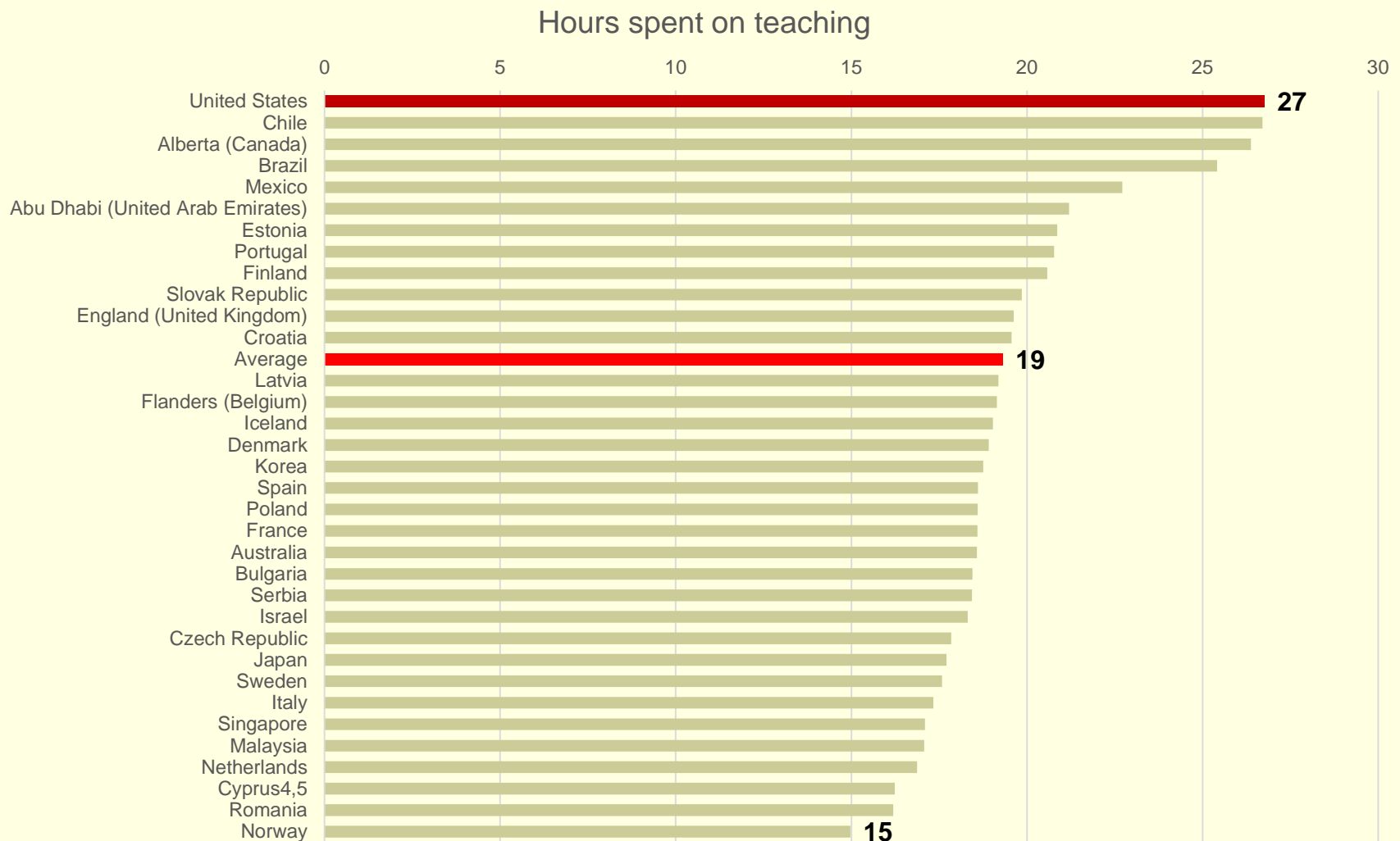# Elements of a Teaching Quality System

Compared to Those in Top-Performing Countries, US Teachers ….

- Are less well compensated
- Have less support for their preparation
- Are less likely to receive mentoring
- Have less time for and access to high-quality professional learning
- Are less likely to receive feedback from peers
- Are unlikely to experience expanded career responsibilities or chances to share expertise
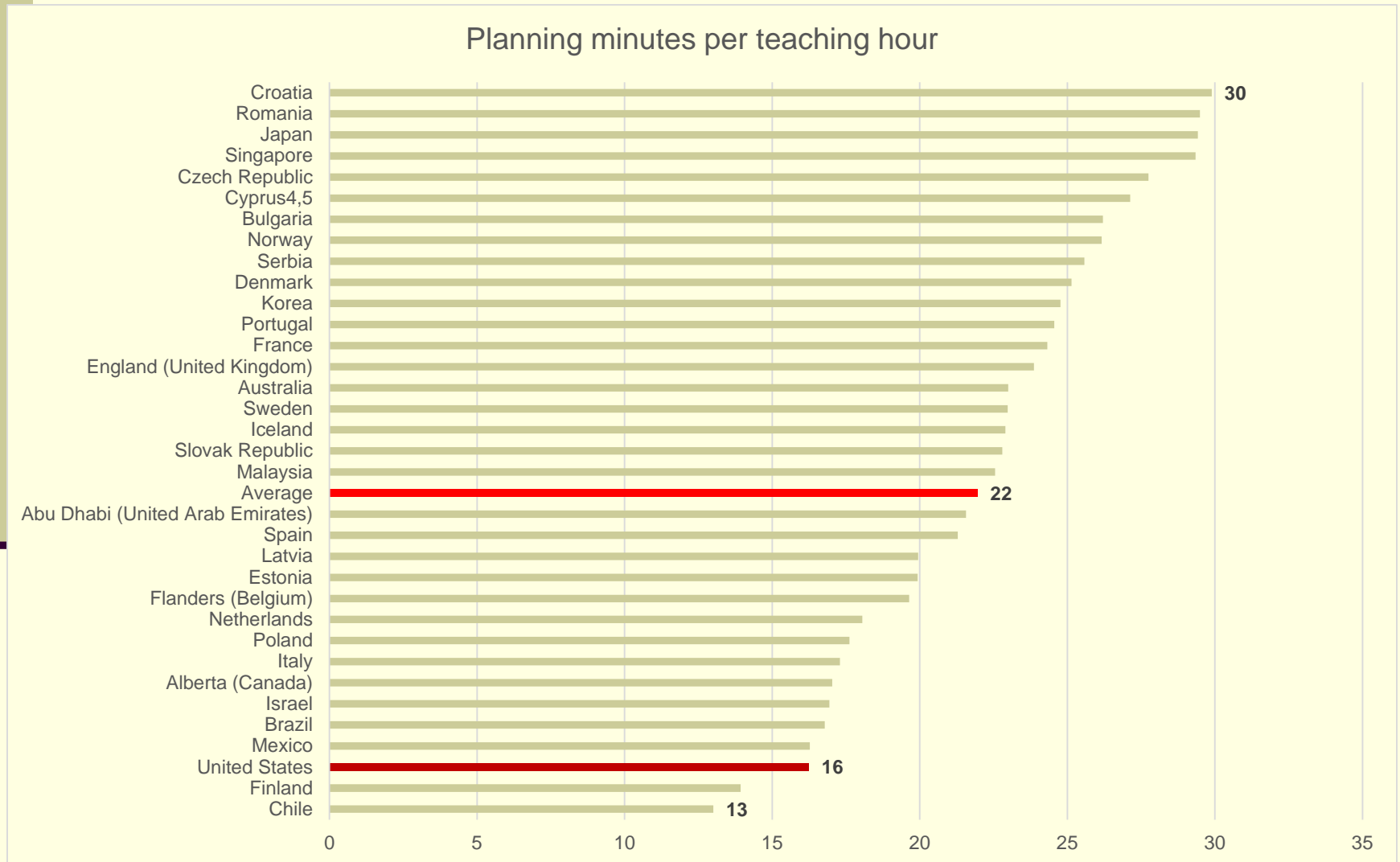- Are less likely to be involved in collaborative planning around curriculum & assessment

US teachers teach
larger classes on average

U.S. Teachers Teach the Most Instructional Hours

Hours spent on teaching

Country	Hours
United States	27
Chile	
Alberta (Canada)	
Brazil	
Mexico	
Abu Dhabi (United Arab Emirates)	
Estonia	
Portugal	
Finland	
Slovak Republic	
England (United Kingdom)	
Croatia	
Average	19
Latvia	
Flanders (Belgium)	
Iceland	
Denmark	
Korea	
Spain	
Poland	
France	
Australia	
Bulgaria	
Serbia	
Israel	
Czech Republic	
Japan	
Sweden	
Italy	
Singapore	
Malaysia	
Netherlands	
Cyprus4,5	
Romania	
Norway	15

US Teachers Have Far Less Planning & Collaboration Time

Planning minutes per teaching hour

Country	Value
Croatia	30
Romania	
Japan	
Singapore	
Czech Republic	
Cyprus4,5	
Bulgaria	
Norway	
Serbia	
Denmark	
Korea	
Portugal	
France	
England (United Kingdom)	
Australia	
Sweden	
Iceland	
Slovak Republic	
Malaysia	
Average	22
Abu Dhabi (United Arab Emirates)	
Spain	
Latvia	
Estonia	
Flanders (Belgium)	
Netherlands	
Poland	
Italy	
Alberta (Canada)	
Israel	
Brazil	
Mexico	
United States	16
Finland	
Chile	13

The more frequently teachers participate in *collaborative practices* with their colleagues,

the higher their level of *self-efficacy and job satisfaction*.

And the more likely they are to use innovative practices.
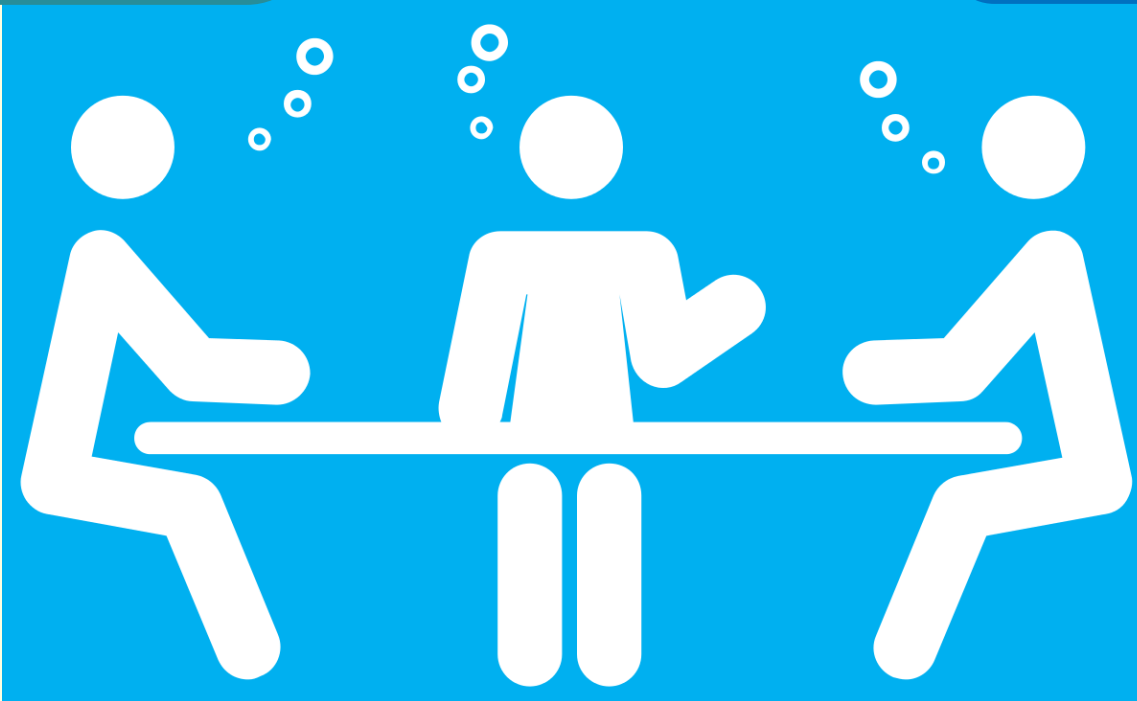
Assembly line vs. Quality work circle

Compensation

- U.S. teachers make about 20% less than other college graduates; 30% by mid-career.

- Salaries have lost ground since the 1990s

- Average starting salaries in 2013 ranged from $27,000 (MT) to $44,000 (AK)

- In more than 30 states, a mid-career teacher heading a family of 4 is eligible for several forms of government assistance

LEARNING POLICY INSTITUTE

Preparation and Mentoring

- Preparation and early mentoring strongly influence teacher effectiveness and retention:
  - Teachers who are unprepared leave within a year at 2-3 times the rates of those who are well-prepared.
  - Those who receive high-quality mentoring and induction stay at twice the rate of those who receive little.

- Funding for both has declined:
  - The debt load for preparation has increased.
  - Only about 2/3 of teachers receive comprehensive preparation before entering.
  - Fewer teachers receive mentoring + principal support (down from 75% in 2008 to 59% by 2012).

Teaching Conditions

- U.S. teachers have more teaching hours and less planning time than others in the world
- Only 15% of teachers report collaborative work environments, down from 30% in 2000
- Resources for teaching declined during the recession; most states are still spending less in constant dollars than in 2007
- Growth in child poverty, homelessness, and trauma makes teaching more challenging

National Headlines, 2016

Teacher shortage keeps area schools scrambling

Washington not alone in hunt for teachers, new report says

Oklahoma school districts look to fill 500 teacher vacancies

Teacher shortage at public schools

Fewer qualified applicants for certified teaching positions

Florida facing teacher shortages in many districts as new school year begins

Help Wanted: Teacher-Shortage Hot Spots

In Utah, schools can now hire teachers with no training whatsoever

RPS dealing with teacher shortage as first day of school looms

Teacher, staff shortage looms as school begins

LEARNING POLICY INSTITUTE

"A new Maryland teacher staffing report just released Tuesday shows every district in the state is dealing with a shortage.

"The results from the teacher staffing report comes just a couple of months into the new school year. What it shows, in part, is a snapshot of frustration. The Maryland State Board of Education admits certified teachers are just hard to come by and even harder to keep on the payroll."
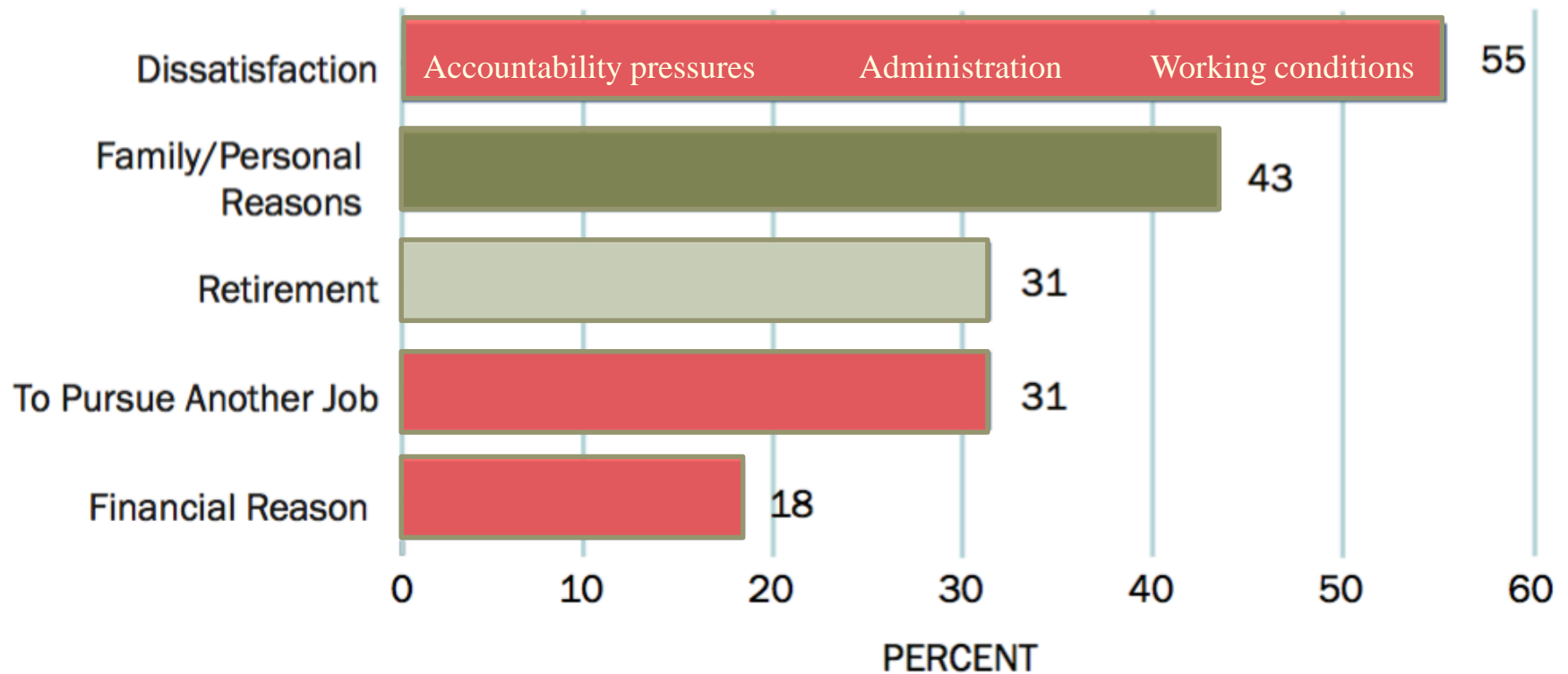
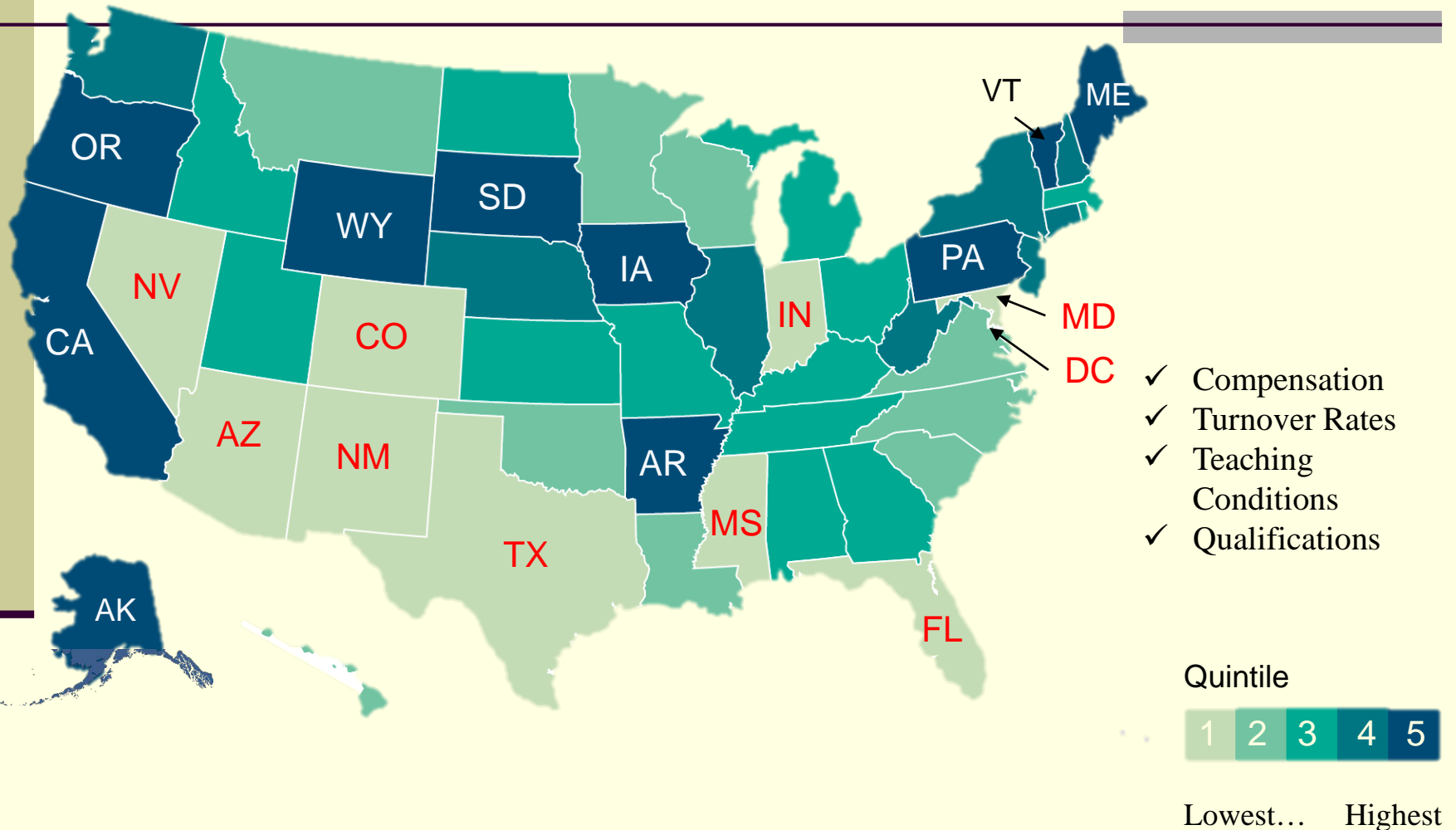# Teacher Preparation Enrollments Down Nationally
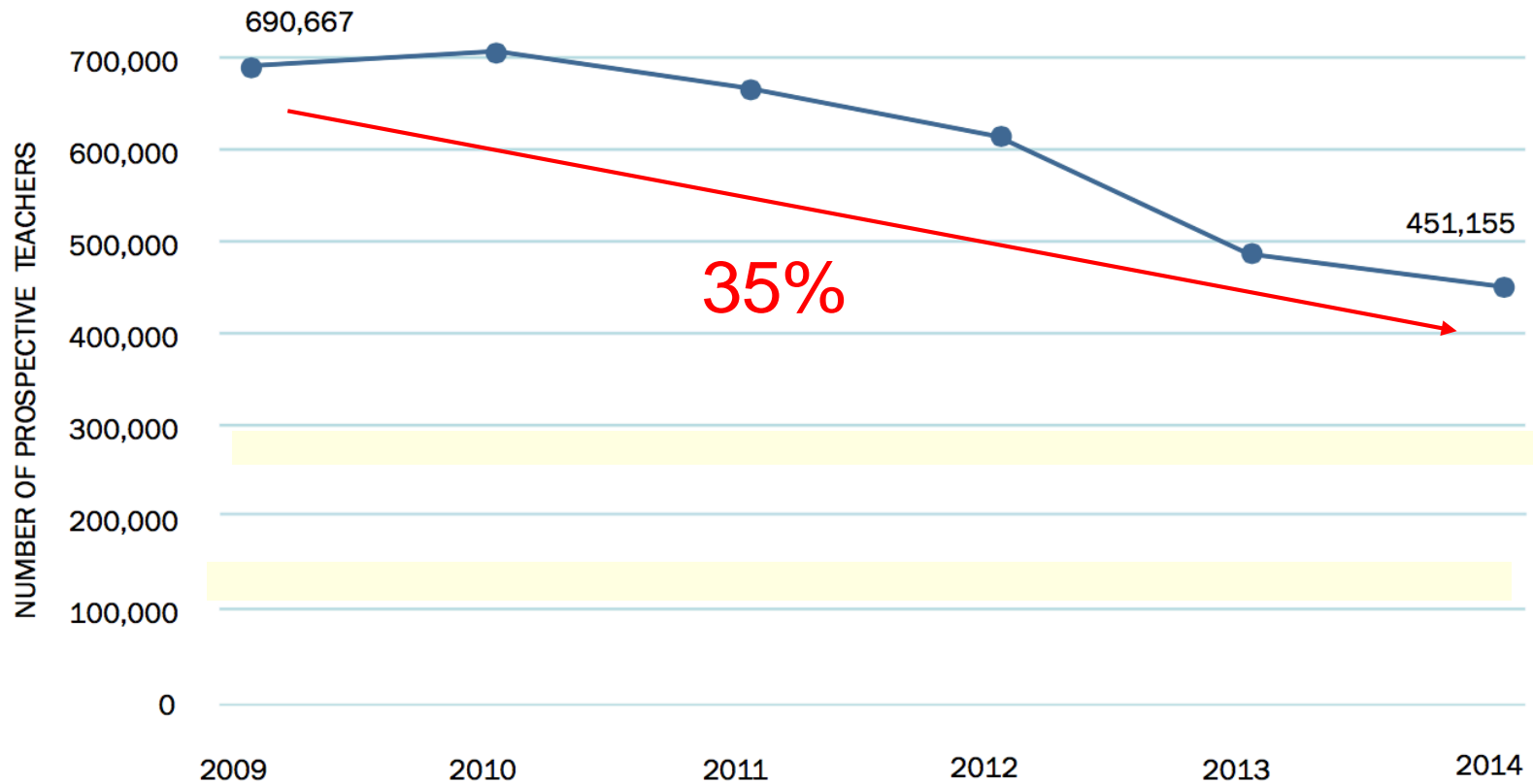
Attrition Drives Shortages
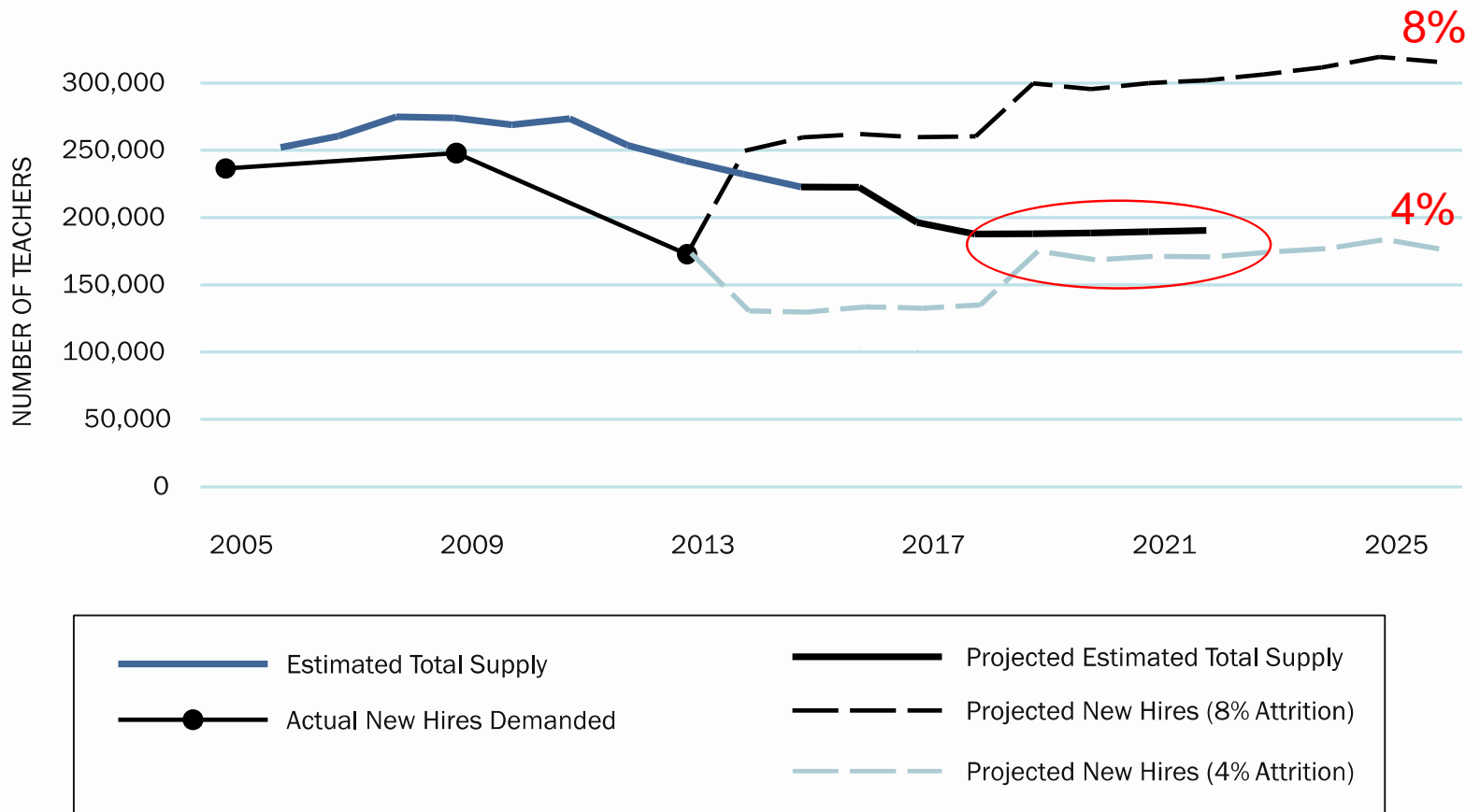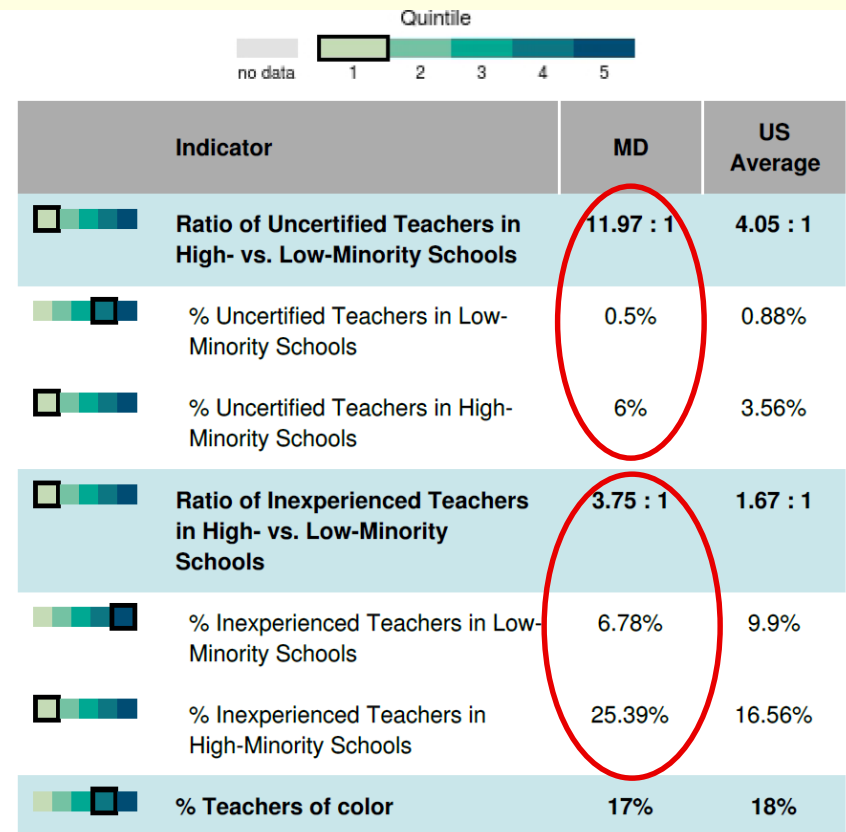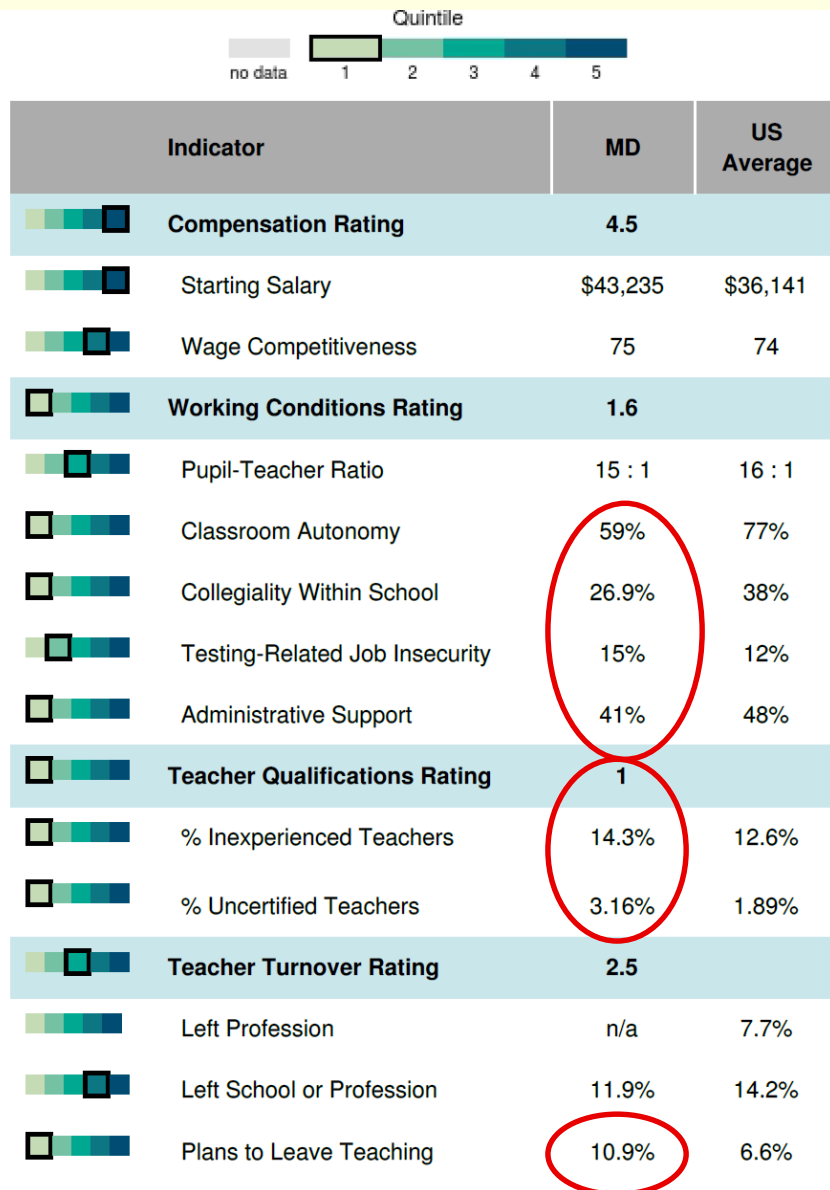
Reasons Given by Teachers for Leaving the Profession
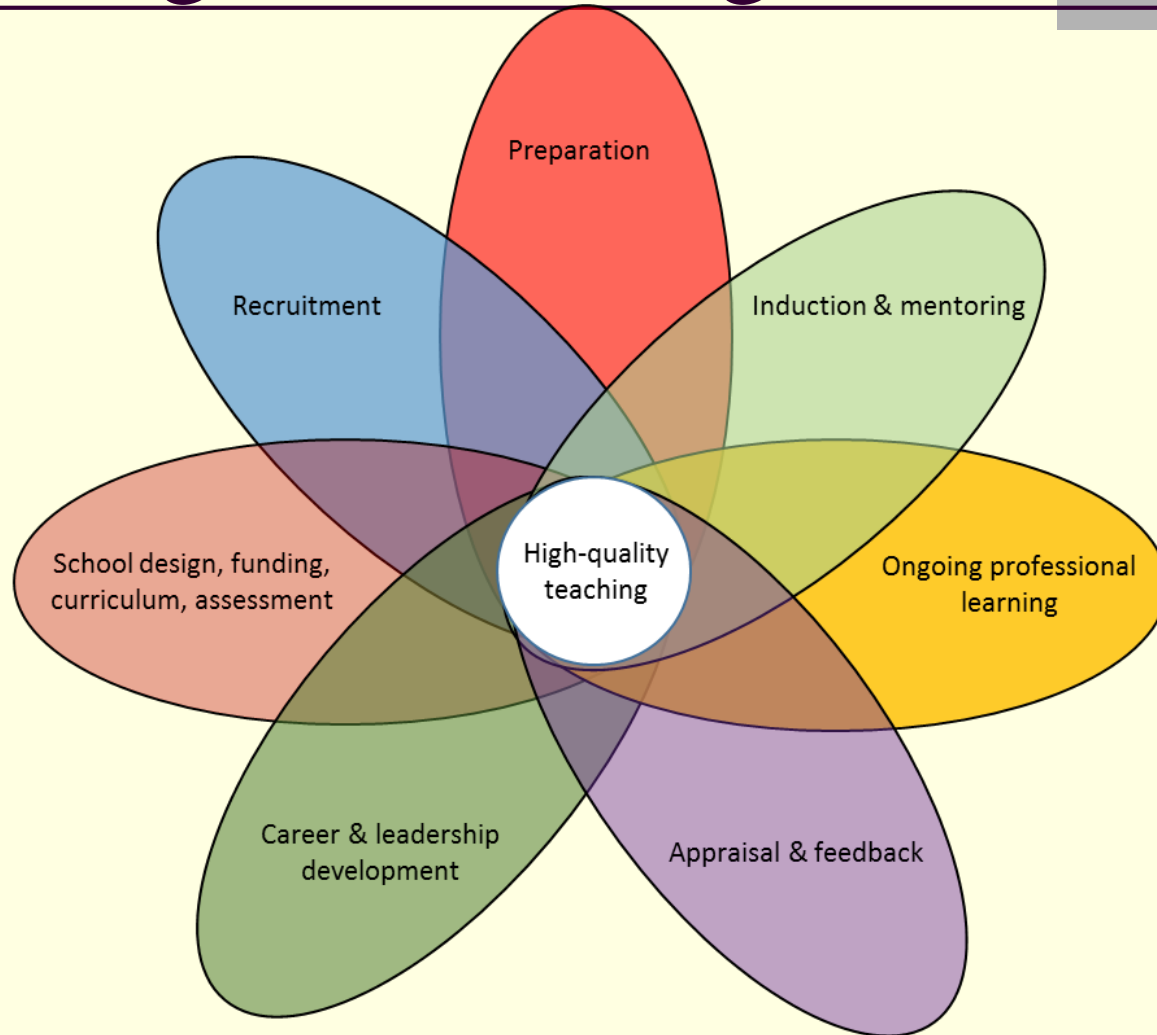
Teaching Attractiveness Varies Across States

- ✓ Compensation
- ✓ Turnover Rates
- ✓ Teaching Conditions
- ✓ Qualifications

Quintile

| 1 | 2 | 3 | 4 | 5 |

Lowest…   Highest

Teaching Attractiveness and Equity in MD

Quintile: no data | 1 | 2 | 3 | 4 | 5

Indicator	MD	US Average
Compensation Rating	**4.5**	
Starting Salary	$43,235	$36,141
Wage Competitiveness	75	74
Working Conditions Rating	**1.6**	
Pupil-Teacher Ratio	15 : 1	16 : 1
Classroom Autonomy	59%	77%
Collegiality Within School	26.9%	38%
Testing-Related Job Insecurity	15%	12%
Administrative Support	41%	48%
Teacher Qualifications Rating	**1**	
% Inexperienced Teachers	14.3%	12.6%
% Uncertified Teachers	3.16%	1.89%
Teacher Turnover Rating	**2.5**	
Left Profession	n/a	7.7%
Left School or Profession	11.9%	14.2%
Plans to Leave Teaching	10.9%	6.6%

Quintile: no data | 1 | 2 | 3 | 4 | 5

Indicator	MD	US Average
Ratio of Uncertified Teachers in High- vs. Low-Minority Schools	**11.97 : 1**	**4.05 : 1**
% Uncertified Teachers in Low-Minority Schools	0.5%	0.88%
% Uncertified Teachers in High-Minority Schools	6%	3.56%
Ratio of Inexperienced Teachers in High- vs. Low-Minority Schools	**3.75 : 1**	**1.67 : 1**
% Inexperienced Teachers in Low-Minority Schools	6.78%	9.9%
% Inexperienced Teachers in High-Minority Schools	25.39%	16.56%
% Teachers of color	**17%**	**18%**

Data are from 2012, 2013, 2014

What Can We Learn from High-Achieving Nations?
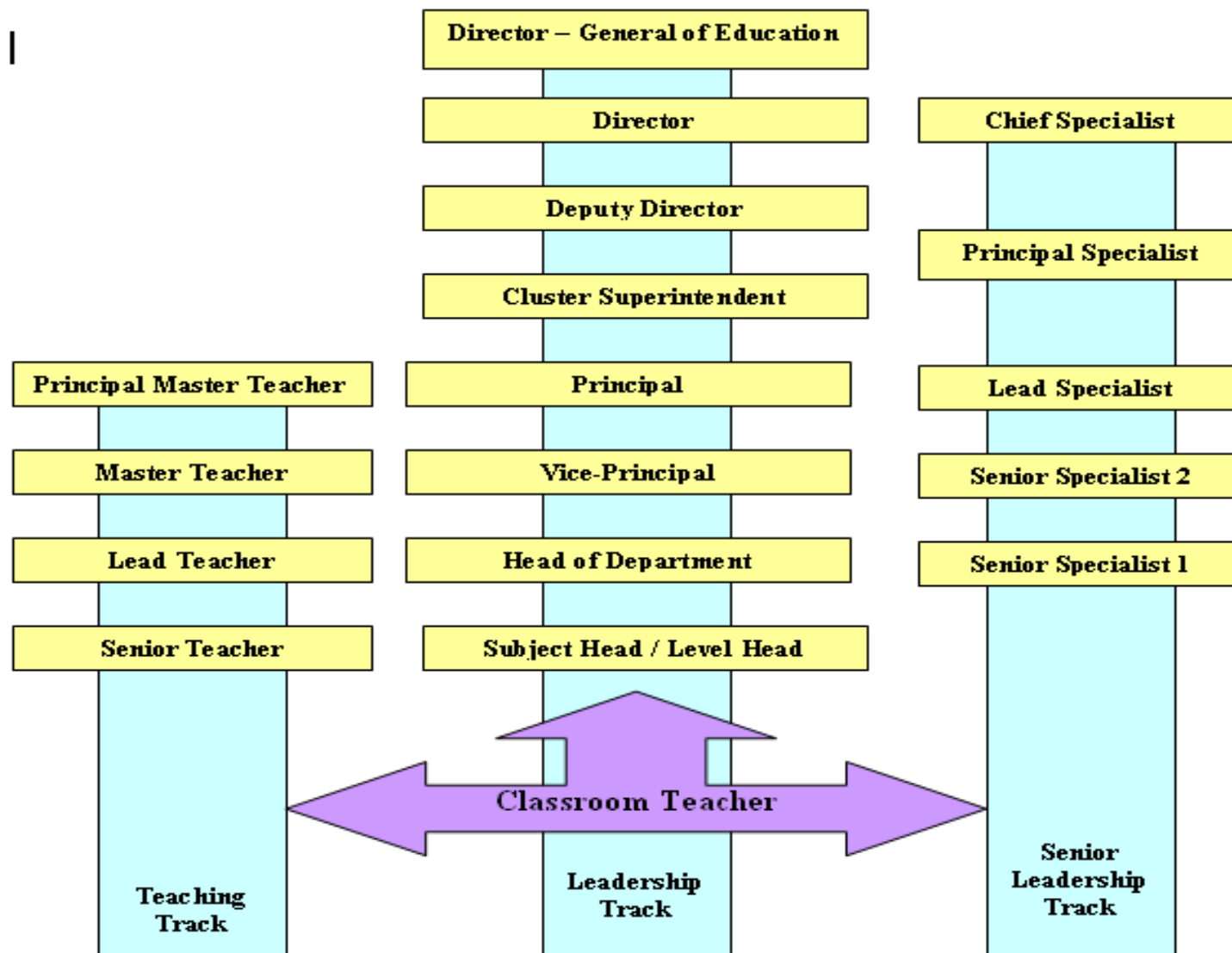
Recruitment

- Competitive recruitment based on academics and dispositions associated with teaching
  - ✓ Research orientation
  - ✓ Commitment to all children & the profession
  - ✓ Interpersonal / verbal skills
- Into a small number of programs of comparable quality and rigor
- Preparation largely or completely paid for
- Some countries also pay stipends/ salaries

Compensation / Career Development

- Salaries comparable to other professions requiring college degree
- Equitable across schools / districts
- Enhanced for teachers taking on additional responsibilities
- Career ladders in Singapore, Shanghai, and Australia / Career lattice in Ontario
- Multiple opportunities for leadership and sharing of expertise

Career Tracks in Education

Teaching Track: Senior Teacher → Lead Teacher → Master Teacher → Principal Master Teacher

Leadership Track: Classroom Teacher → Subject Head / Level Head → Head of Department → Vice-Principal → Principal → Cluster Superintendent → Deputy Director → Director → Director – General of Education

Senior Leadership Track: Senior Specialist 1 → Senior Specialist 2 → Lead Specialist → Principal Specialist → Chief Specialist

Fostering Teacher Growth & Development

SUPPORTS FOR GROWTH

- **Teacher Learning and Leadership Program** (TLLP)

- **Annual Learning Plan** (ALP)
- **Teacher Performance Appraisal** (TPA)

- **New Teacher Induction Program** (NTIP)

- **Initial Teacher Education** (ITE)
- **Building Futures** (BF)

OPPORTUNITIES FOR LEADERSHIP

- **TLLP Project Leader / Team Member**

- **Department Head / Chair**

- **Board Consultant / Coach**

- **NTIP Mentor**

- **Associate Teacher**

- **Community of Practice Member (face to face or online)**

Excellence   Well-Being

All Learners

Equity   Public Confidence

AUTHENTIC LEARNING

- **Inside-Out Transformation**
- **Student-Centered**
- **Collegial Involvement in Planning**
- **Teacher-determined learning goals**
- **Collaborative construction of knowledge**

Preparation

- Guided by Professional Standards of Practice
- Research-Based and Research-Oriented
- Strong Preparation in
  - ✓ Content-Specific Pedagogy focused on 21st Century Skills
  - ✓ Learning and Development
  - ✓ Curriculum and Assessment
- Learning in Practice with Expert Mentors

Professional Teaching Schools

- As in medicine and other professions, teaching schools allow teachers to see and enact best practices linked to research and theory

- Professional teaching schools support learning from expert veterans <u>while</u> candidates are taking tightly linked coursework. They model state-of-the art education for students and teachers as well as opportunities for developing curriculum, new practices, and research.

"Model" Schools in Finland

3 master's degrees and PhD

Mentor Teachers

3 current research projects; Recently published a book

Finishing PhD

Induction for Beginners

- Regularly available to all
- Guided by trained Senior / Mentor Teachers
  - ✓ In-classroom coaching
  - ✓ Curriculum and lesson planning
  - ✓ Seminars on key topics
- Reduced teaching load
- Typically 2 years // 4 years in Toronto

Professional Learning Cycle (Australia)
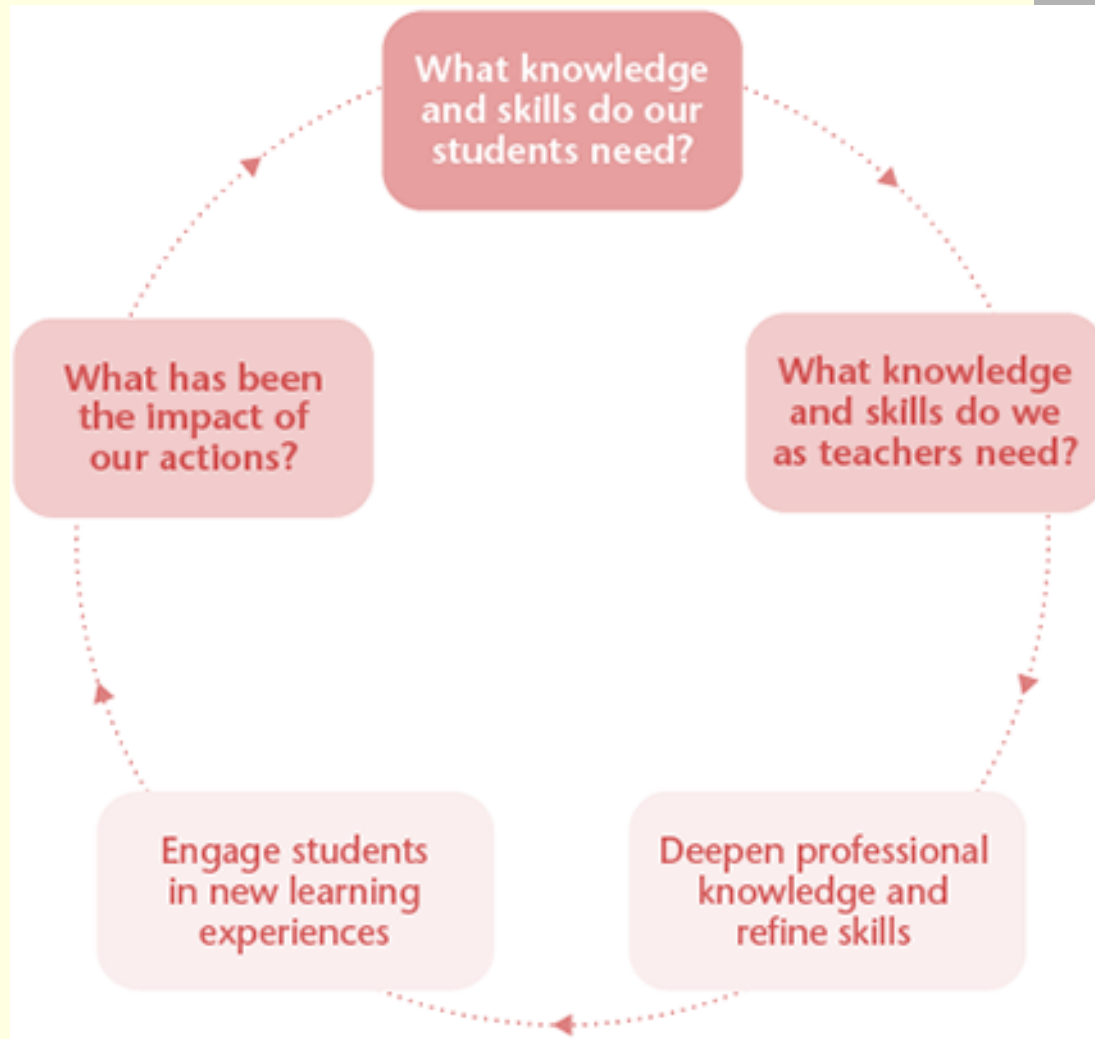
Professional Learning Opportunities

- Rich array of institutes, workshops, conferences "by teachers for teachers"
- Teacher and school networks
- Research grants and collaborative R&D opportunities (+publication and adoption)
- Sustained learning opportunities embedded in practice:
  - Teachers have 15-25 hours a week for planning and collaboration + paid time for professional learning
  - Teachers engage regularly in Lesson Study, Action Research, and Peer Observation and Coaching to evaluate and improve practice.

Professional Learning Opportunities that Impact Practice are:

- ✓ Focused on learning specific curriculum content
- ✓ Organized around real problems of practice
- ✓ Connected to teachers' work with children
- ✓ Linked to analysis of teaching and student learning
- ✓ Intensive, sustained and continuous over time
  - ✓ Supported by coaching, modeling, observation, and feedback
  - ✓ Connected to teachers' collaborative work in professional learning communities
  - ✓ Integrated into school and classroom planning around curriculum, instruction, and assessment

Assessment
of, as, and for Learning

Assessment measures are structured to continuously improve teaching and learning.

Around the World, Teachers Collaborate in Assessment Design, Scoring, and Evaluation

Assessments
Support Teacher Learning

- As models of good instruction

- As exemplars of quality work and standards

- As diagnostic information regarding learning – especially when feedback shows actual performances, not just scores

- As a focus for professional conversation about standards, curriculum, and instruction

- As information to guide investments in professional development

The Challenge Ahead

- All of these best practices exist somewhere in the US
- Nowhere are they yet assembled together into a teaching and learning system
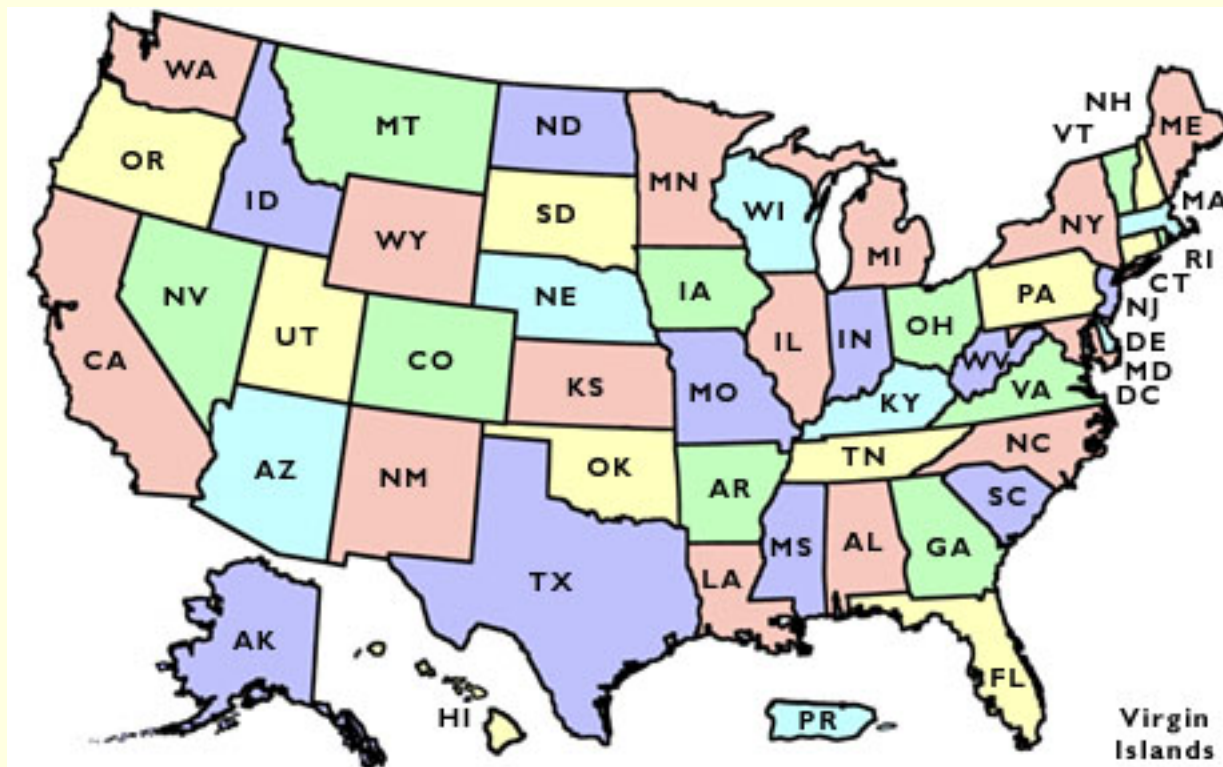
Bureaucratic vs. Professional Approaches to Education

Bureaucratic ⟹ Doing School

- Expertise rests at the top of system
- Teachers have minimal skills
- Research, tests, and texts are aimed at controlling practice
- Decisions are made hierarchically
- Emphasis is on procedures: "Doing things right"
- Practice is standardized
- Schools function as assembly lines

Professional ⟹ Enabling Learning

- Expertise rests in the classroom
- Teachers have extensive knowledge and skill
- Research is aimed at informing practice
- Decisions are made with colleagues based on standards of practice
- Emphasis in on what works: "Doing the right things"
- Schools function as communities of learning

This Problem Has Been Solved Before

In the 1990s, CT and NC both eliminated shortages and increased achievement by:

- Increasing and equalizing salaries
- Offering service scholarships and loans
- Raising standards for teacher preparation
- Introducing strong mentoring systems
- Offering high-quality professional development
- Training principals to support teaching

Better compensation packages:

- Competitive, equitable salaries
- Financial incentives
  - ✓ Housing
  - ✓ Child care

Build lasting teacher supply:

- Forgivable loans, scholarships
- High-retention preparation pathways
  - ✓ Strong clinical teacher education
  - ✓ Grow Your Own programs
  - ✓ Teacher Residencies

Policy recommendations

Improve retention:

- High-quality mentoring
- Collegial work environments
- Administrator training

Enhance mobility:

- License reciprocity
- Pension portability

38

International Lessons in Teacher Education
Linda Darling-Hammond
with
Dion Burns, Carol Campbell, A. Lin Goodwin, and Ee Ling Low

A growing body of research has found that high-performing countries often share a common set of strategies for recruiting, preparing, and supporting teachers (Barber & Mourshed, 2007; Tucker, 2011). These countries not only recruit and train individual educators well, they deliberately organize the sharing of expertise among teachers and administrators within and across schools, so that the system as a whole becomes ever more effective. And they not only cultivate innovative practices, they incorporate them into the system as a whole, rather than leaving them as exceptions at the margins.

This article describes how two high-performing educational systems – Ontario, Canada and Singapore -- create policy systems designed to ensure quality teaching across communities – and compares their systematic approaches to the much less coherent policy system in the United States. These cases are drawn from a recently completed study of international teaching policy in which we examined, with colleagues, seven jurisdictions within five countries around the world that have worked to develop comprehensive teaching policy systems.[1] The broader study from which this article is drawn (Darling-Hammond et al., 2017, in press), describes how governments in these places have carefully developed, planned and implemented what we call a *teaching and learning system*, and the lessons that can be learned from these systems.

Methodology

The study employed a multi-method, multiple case study design in order to investigate the policies and practices that support teaching quality within education systems. In larger countries, both national and state or provincial policies were examined to develop an understanding of the policy system. In these cases, the state or province was treated as a case nested within the larger country case. The research was conducted during 2013-2015 following a common set of research questions and protocols for each type of data collection:

- A review of literature and document analysis regarding teacher development policies, practices, workforce characteristics, and trends for each jurisdiction;
- Analyses of international, national, and, where applicable, state data sources regarding compensation, work hours, surveys of teaching conditions and teachers' views;
- Recorded interviews with policymakers, government officials, education leaders, principals, teachers, and teacher educators in each jurisdiction;
- Detailed observations of activities in schools and classrooms, along with other key meetings and professional learning events in pre-service and in-service settings.

These data were triangulated through an analytic process that sought themes, along with efforts to surface disconfirming evidence, within and across cases.

We discuss the Ontario and Singapore cases here, because in some ways, they are most like states in the U.S. in their size and student demographics. Serving highly diverse student populations with large numbers of immigrants while seeking to meet more challenging learning standards geared to 21st century expectations, each of these jurisdictions has focused intently on how to develop and support higher quality teaching across all of its schools.

Ontario, Canada[2]

One of the highest-performing provinces in one of the highest-performing countries in the world is Ontario, where 28% of students are immigrants, nearly twice the proportion in the United States. In Toronto, the provincial capital, more than 100 languages are spoken. In this diverse context, teaching is a highly-respected profession, with low attrition and such substantial surpluses that many beginning teachers take substitute positions for several years until a permanent position becomes available. Ontario has become well-known for its systemic approach to school improvement that has sharply improved school outcomes over the last decade.

The Context for Teaching

Ontario went through a significant change in government and education policy in 2003, reversing an era of teacher-bashing and cuts to schools. The new government placed a strong emphasis on strengthening the teacher workforce: With investments in teacher preparation and development, a major leadership development initiative, and extra resources with technical assistance to low-performing schools, graduation rates and achievement levels climbed. Provincial and district general funds were even more intensely targeted to schools with greater needs, and the proportion of underperforming schools was cut in half, even as standards for student performance were raised. Achievement gaps between first-language English speakers and English language learners were reduced.

A key feature of the Ministry's approach has been to better connect policy to practice through a staffing model that brings experienced educators into the Ministry on rotating assignments in which they help shape policy and implementation plans.

Curriculum and Assessment. With no national curriculum, each province has developed curriculum guidance and programs of study that help organize teaching and teacher development. In Ontario, the Ministry of Education has established a research-based, educator-involved continuous cycle of curricular review, with the aim of keeping the curriculum current and developmentally appropriate. Periodic assessments in grades 3, 6, and 9 (math) or 10 (literacy) are used to provide feedback for improvement.   Teachers are supported to develop methods that use "assessment as, of, and for learning" in a variety of ways, including "learning conversations, questioning, conferences, homework, tasks done in groups, demonstrations, projects, portfolios, developmental continua, performances, peer and self-assessments, self-reflections, essays, and tests" (Ontario Ministry of Education, 2010).

Attractiveness of the Profession. With strong improvements in the status and attractiveness of teaching, attrition has declined to about 4 percent annually (about half the rate in the U.S.). Salaries begin at or above the average of other occupations that require college degrees. For example, the salary of a fifth-year teacher is well above the average (at the 75th percentile) for individuals with university degrees working one full-time job. New teachers are highly committed to their careers; of those in their first five years, approximately 9 in 10 indicated that they will definitely or probably be in the teaching profession five years hence (Ontario College of Teachers, 2011).

Fewer than half of aspiring candidates are accepted into programs in Ontario. At the largest institution, the Ontario Institute for Studies in Education at the University of Toronto, only one in four candidates is selected. To enter teacher education in Ontario, candidates must demonstrate competencies set by the Ontario College of Teachers' Standards of Practice emphasizing moral commitments as well as knowledge and skills. In order to increase diversity in the teacher population, teacher-candidates who can bring knowledge of Aboriginal issues and connections with Aboriginal communities into their teaching practices are also a priority.

Teacher Education

All of the jurisdictions we studied paid most or all of the cost of teacher education for their candidates. And all were moving increasingly toward graduate level teacher education. In Ontario, the government covers about 60 percent of the cost of candidates' preparation, with additional incentives for those who will teach in high-need locations, such as more remote First Nations communities. A new policy enacted in 2015 doubled the minimum length of teacher education from one year to two years, which can be undertaken during or after the bachelor's degree, and doubled the minimum length of clinical school placements. The reforms also added an enhanced emphasis on diversity and students with special needs, as well as an increased focus on the use of technology.

Many programs are now following the lead of the largest program in the province, the University of Toronto / Ontario Institute for Study of Education (UT / OISE), which created a two-year master's level program for preparing teachers in 2003, with significant clinical practice at partner schools integrated with academic and pedagogical studies. With a strong program focus on equity, diversity, and social justice,[3] teacher candidates learn to undertake their own research as well as using research generated by others – another hallmark of teacher education we saw across multiple countries, from Finland and Singapore to Australia and China.

All programs are expected to support teachers' capacities to serve diverse populations of learners well, and several programs in the province provide models aimed especially at preparing teachers to teach native students. The most extensive is at Lakehead University, in the Northern city of Thunder Bay, which has Canada's only department of Aboriginal Education. Lakehead's set of teacher education programs focused on aboriginal cultures and traditions include courses in Native Languages (Cree & Ojibwe) and Indigenous Learning, as well as courses that address the context of teaching in Aboriginal settings, with clinical experiences that can include apprenticeships with elders or other cultural leaders, research projects, and the design of culturally relevant teaching resources, along with traditional student teaching.

All programs are designed to help candidates achieve Standards of Practice competencies set by the Ontario College of Teachers, which resemble the standards created by the National Board for Professional Teaching Standards in the United States. With a huge surplus of teachers in Ontario, policymakers decided that preparing fewer teachers more thoroughly and enabling them to be more successful from the start made sense. As in Finland and Australia, this greater success is anticipated as a result of merging theory and practice, focusing more on the sophisticated and targeted strategies needed for teaching students with a wide range of needs, and learning how to enact an "equity pedagogy" (Banks & Banks, 1995) in the classroom. A key Ministry official we interviewed noted that the changes

…. were not purely a response to oversupply. It is as well a response to what teachers should bring to the table as 21st century learners and 21st century educators meeting the needs of a 21st century society: It is supporting teacher candidates to develop a mindset and culture of learning as learners who respond to the needs of all students…. (including) special education students and students from our Aboriginal communities. I see these as important issues in the new teacher education curriculum.

Induction

These same goals also inform the two-year New Teacher Induction Program, established in 2006 and funded by the Ministry. Both mentors and mentees receive shared release time for collaborative planning, classroom observation, and assessment of student work designed to enhance teachers' practice and support their commitment to continuous professional learning.

Mentors are selected for their teaching and mentoring skills and are trained within their district. They demonstrate teaching strategies, offer coaching and feedback, provide advice around classroom management and teaching strategies, and offer emotional support. A major emphasis is on helping novices manage professional relationships and learn to seek out the resources they need for ongoing growth and development.

Mentoring is designed to be supportive, rather than evaluative. Principals conduct two performance appraisals throughout the first twelve months, and, if not ready to be certified, teachers are given up to twenty-four months to improve. While a small number of teachers are counseled out, a major goal is to help novices become expert and keep them in the profession. With that in mind, the Toronto School Board – the largest and most diverse district in the province -- has extended mentoring for an additional two years beyond NTIP and has organized the four-year program to offer demonstration classroom learning: focused observations, debriefing, action planning, and co-teaching opportunities in various grades and subjects, along with professional learning for mentors.

The results have been noteworthy. More than 95% of new teachers renew their licenses in the province (Ontario College of Teachers, 2012), and 98 to 99% of Toronto's beginning teachers have been retained annually between 2005 and 2010.   The result is a strong start on a career in teaching. As a University of Ottawa report concluded:

> Beginning teachers across Ontario are confident in their own abilities as teachers responsible for supporting student learning. They are satisfied with their choice of profession; they intend to remain in the teaching profession and a large majority would like to remain in the same school. (Darling-Hammond, 2013, p. 67)

Ongoing Professional Learning

Once teachers have joined the profession, there is a vast array of professional learning opportunities and supports available. The teachers' federations play a significant role, with thousands of teachers participating annually in activities developed "by teachers, for teachers." The government funds hundreds of teacher action research projects each year as part of a Teacher Learning and Leadership Program. These have had a profound effect on schools as they are disseminated through province-sponsored networks, conferences, publications, and other knowledge sharing vehicles. Time is made available for learning: 90% of respondents report

participating in professional learning activities during the school day (Directions Evidence and Policy Research Group, 2014).

Professional learning is linked to teacher evaluation, guided by an Annual Learning Plan, in which teachers set growth goals, along with a rationale, a set of strategies, and an action plan for achieving them. Ontario has a well-developed system for supporting teacher leadership opportunities – as mentors, action researchers, and leaders of school improvement strategies -- and for recruiting and preparing many as principals who are trained to support teacher learning and collaboration and further distribute leadership opportunities within the school. In a virtuous circle, these conditions make teaching attractive, support recruitment of talented individuals, and enable a well-prepared and committed teaching force.

Singapore[4]

A tiny island that became an independent country only in 1965, Singapore has rocketed in the past half century to become an international leader in education, although few of its citizens were educated beyond primary school 50 years ago. This surprising rise to prominence began with the release of results from the 2003 Trends in International Mathematics and Science Study (TIMSS), which showed that 90% of Singaporean students scored above the international average in mathematics and science. Singapore's fifteen-year-olds have also consistently ranked at the top in all subjects on the Program for International Student Assessment (PISA). Today, about 75% of young people complete a postsecondary technical or college degree; the remainder receive a well-resourced up-to-date postsecondary vocational training that prepares them for work, which is increasingly likely to be in one of Singapore's many multinational corporations.

Singapore's diverse multicultural and multilingual society is comprised primarily of Chinese, Malay, and Indian peoples, whose 'mother tongue' languages – Mandarin, Malay, and Tamil – are taught in all schools. Although English is the language of instruction in Singaporean schools, it is not the primary language for most students, all of whom become bilingual.

The Context for Teaching

With few natural resources, Singapore regards its citizens as its most valuable resource, placing education as a central concern in policy and government investment. The nation aims to develop internationally-minded, culturally-competent citizens with a high degree of literacy and technical expertise. Well-trained teachers are seen as a key vehicle to achieving this goal.

Design of the System. With a population about the size of Wisconsin condensed into a much smaller area, Singapore's Ministry of Education (MOE) takes on what would elsewhere be the functions of a national, a state, and a school district. This allows for a tight alignment of policy between schools, the Ministry, and the National Institute of Education, the country's only teacher training facility. The Ministry has organized 30 clusters of 10-13 schools each to support policy implementation, professional learning, and the sharing of good practices across schools. Educators are expected to contribute to the effective functioning of both their school and their school cluster.

A commitment to learning for all students is a feature of education in Singapore. All students are regarded as diverse learners with different potentials, and the role of government is considered to be that of equalizing educational opportunities to allow students to reach that

potential. This informs the approach to curriculum as well as school funding, which is pegged to student needs. Higher education is also heavily subsidized, with low tuitions and need-based aid.

Curriculum and Assessment. Since 1997, Singapore has worked to focus curriculum and teaching on creative thinking and learning for a global economy. The "Thinking Schools, Learning Nation" initiative emphasized the need to move away from rote learning and move towards engaged learning and has stimulated innovative pedagogies and technologies.   The "Teach Less, Learn More" initiative, introduced in 2004, led to changes in the curriculum and examination system, including the introduction of project-based assessments to accompany the more traditional essay and oral components. Assessments are given in grade 6, 9, and high school and have had a strong influence on school curriculum.

Teacher Education

Teaching is a highly attractive profession in Singapore. Salaries are comparable to those of engineers. Tuition for teacher education is free, and candidates receive a salary while they are preparing to teach. In exchange, graduates must teach for 3 or 4 years, depending on whether they complete an undergraduate or graduate program of study. The vast majority stay in teaching for a career: annual attrition rates are typically below 3%. According to a Ministry survey, teachers stay because of a positive professional culture, competitive wages, and ample opportunities for professional development and career growth.

With these attractions, Singapore can be very selective in admissions to initial teacher education. In addition to review of their academic qualifications and an English proficiency test, shortlisted candidates are interviewed by a panel of experienced principals, who assess their aptitude for teaching, communication skills, passion for education, and the potential to be a good role model. Approximately one out of eight applicants makes it through the selection interview.

After an introductory course which treats issues like adopting a growth mindset, lesson planning, assessment for learning, and use of technology, they complete a brief stint as a contract teacher in a school under the wing of a mentor teacher. Only if they receive a good recommendation from the school and pass an assessment can they enter teacher preparation. Candidates can still be dismissed during the program, although this rarely happens. Successful applicants are assured of employment upon program completion.

All pre-service teacher and leadership preparation programs are conducted by the National Institute of Education, as are a range of in-service programs for teachers, mentors, and principals. Teacher education is guided by standards that were developed to support the 21st century competencies established for students and the nation's new vision of teaching and learning. The NIE has established a framework for teacher preparation that articulates the values, skills, and knowledge needed of a 21st Century Teaching professional who can develop learners who are problem solvers, critical thinkers, and contributors to the community. Competencies for teachers-in-training, modeled after those used in the teacher evaluation system for in-service teachers – begin with "nurturing the whole child;" continue with "winning hearts and minds," including helping to develop others; and conclude with "knowing self and others," including integrity, respect, resiliency and adaptability.

Singapore has been moving toward graduate-level training of teachers: about two-thirds of entrants now complete a one-year master's degree program, and one-third completing a four-year undergraduate program. Students complete a major in an academic discipline either before or during their preparation. Primary teachers are prepared to teach three subjects; secondary

teachers are prepared to teach two. Curriculum studies aim to equip student teachers with pedagogical methodologies for teaching specific subjects.

The teacher-education curriculum includes study of the academic subjects for which teachers are responsible; curriculum, teaching, and assessment; information and communication technology; teaching of language and academic discourse skills, character and citizenship, service learning, and research. A new school partnership model engages schools more proactively in supporting trainees during their practicum experiences.

At the NIE, candidates learn to teach in the same way they will be asked to teach. Every student has a laptop, and the entire campus is wireless. The library spaces and a growing number of classrooms are consciously arranged with round tables and groups of three to four chairs, so that students will have places to share knowledge and collaborate, complete with access to full technology supports (e.g., DVD players, video and computer hookups, plasma screens, etc.). The focus is on teaching for problem-based and inquiry learning, on developing collaboration, and on addressing a range of learning styles in the classroom. Teachers learn to develop assessment practices *of, as* and *for* learning: designing assessment tasks, integrating assessment into teaching and learning, providing feedback to help learners improve, helping students learn to self-asses, so that they can become reflective and self-directed.

The practicum component of preparation (22 weeks in the four-year undergraduate program and 10 weeks within the 16-month postgraduate program), is structured to build candidates' skills incrementally as they gradually assume more responsibility and reflect on their practice. In order to ensure that student teachers develop these reflective qualities, they are required to maintain a Teaching and Learning electronic portfolio to organize evidence of their learning, accomplishments, and philosophical development over time.

Induction

All new teachers are immersed a two-year **Beginning Teachers' Induction Program (BTIP)**. The BTIP aims to nurture both ethical commitments and their skills. A structured mentoring program within the school is typically overseen by the School Staff Developer who acts as a "mentor for mentors" while also coordinating professional learning in the school. Novices are assigned a trained mentor, typically in their subject area -- a senior teacher who serves as a pillar of professional support, offering technical assistance and modeling, socio-emotional support, professional development, resource sharing. Novices also receive support from others in the school. Ms Tan Hwee Pin, Principal of Kranji Secondary School, described the support for beginning teachers in this way:

> We welcome our Beginning teachers (or BTs) to our school as part of our Kranji family. It is important to induct them into our school's culture so that they know the role that they play and the expectations and standards required when they interact with our students. Our structured mentoring programme (SMP) is led by a team of seven senior teachers, under the advice of our vice-principal. Every BT or trainee will be given an experienced teacher as their mentor. BTs not only observe lessons of their subject areas, but also teachers from other subjects; I believe that every subject teacher has different strengths and they employ different pedagogies in different disciplines. By casting the net wider, new teachers will be able to assemble a repertoire of strategies, which they can activate when they become a full-fledged teacher.

Beginning teachers are typically given about 80% the teaching workload of an experienced teacher to take advantage of these resources. While novices are being mentored within their school, they attend in-service courses designed specifically for them, covering topics such as classroom management, parent engagement, teacher-student relationships, reflective practice, and assessment literacy.

Experienced teachers also receive mentoring assistance, as mentoring is considered a school-wide practice that benefits all teachers and encourages growth. Teachers in Singapore are much more likely to have an assigned mentor or to be a mentor than teachers in any other country participating in the international TALIS survey (OECD, 2014, p. 332).

Professional Development

Singapore provides substantial investment in the ongoing development of teaching. All teachers are entitled to 100 hours of paid professional development annually. In addition, teachers can make use of their scheduled nonteaching hours – about 20 per week -- to work with other teachers on lesson preparation, visit each other's classrooms to study teaching, or engage in professional discussions and meetings with teachers from their schools or across schools in learning communities. Teachers are also supported to conduct action research, lesson study or other teacher inquiry approaches on their teaching and to continually revise their teaching strategies in response to what they learn.

Both the NIE and the Academy of Singapore Teachers (AST) provide training for teachers, as well as mentors and senior teachers who help guide action research and other projects of each school's professional learning communities. Many teachers are involved in research and innovation projects examining their teaching and learning to better meet the needs of students. Findings from teacher research are shared at the departmental and school level, other local schools, and at local and international conferences.

School networks provide a further important source of professional learning for teachers. The cluster system serves as a professional learning platform for principals and teachers to share practices across schools. The professional learning work of the clusters is managed substantially by teacher leaders from each school, who receive additional training to help to build their leadership capacity so that they can, in turn, build the capacity of teachers in their schools.

Appraisal and Career Development

Much of this is made possible by the teacher appraisal system and career ladder, which are designed to identify teachers' strengths as well as needs, and to support training and growth opportunities for teachers on career paths in teaching, leadership, or senior specialist tracks. Those who embark on the teaching track become the senior teachers, lead teachers, master teachers, and principal master teachers who fulfill many of the mentoring, coaching, and professional development roles described above. The senior specialist track prepares teachers to become experts in areas such as subject matter curriculum, assessment, educational technology, or other strands within schools or the Ministry headquarters.

Those on the leadership track can become department heads, assistant principals, principals, and move into roles at the Ministry. Leaders are identified, cultivated, and recruited from among teachers who demonstrate potential to take on school leadership roles. For all of these tracks, training is provided at government expense before they take on their posts and ongoing development afterward. This well-developed policy system provides a continuum of support for teacher learning and leadership.

The U.S. Context

As we reflect on teacher preparation and development in the United States in light of these systems and others around the world (see, for example, Darling-Hammond, 2012; Darling-Hammond et al., 2017, in press; Wei, Darling-Hammond, & Adamson, 2010), two contrasting conclusions emerge: First, many of the innovative practices we saw in various countries exist and were often launched in the United States, from which they spread elsewhere in the world. Second, no state in the U.S. currently has a set of policies to support quality teaching stitched together in as coherent and continuous a fashion as what we saw in these systems, although some come closer than others.

For this reason, there are substantial teacher shortages emerging once again in the United States, with little purposeful policy to address them. This is function both of a 30% decline in teacher education enrollments since 2009 and the high attrition rates – about 8% annually – that the United States maintains (see Sutcher et al., 2016, in press). Traditional responses to shortages in the U.S. expand hiring by reducing standards rather than increasing incentives. This is especially true for those who teach in under-resourced schools serving low-income and minority students, further expanding the holes in the leaky bucket of teacher supply, as the least prepared leave at rates three times those of fully prepared teachers (Sutcher et al., in press, 2016).

The countries we studied, and others that rarely experience teacher shortages, have made substantial investments in teacher training and distribution in the last two decades, including

- Salaries that are competitive with other professions and equitable across schools (often with additional incentives for hard-to-staff locations),
- High-quality teacher education, usually at the graduate level and largely at government expense, increasingly including extensive practice teaching in linked partnership schools,
- Mentoring for beginners in their first years of teaching from expert teachers, coupled with a reduced teaching load and collaborative planning time,
- Collegial work settings offering ongoing professional learning embedded in 10-20 hours a week of planning and professional development time,
- Opportunities for expert, veteran teachers to lead research and innovation projects, curriculum development, professional learning communities, and mentoring.

While some states have, from time to time, pulled together a systemic set of supports for teaching that have created an integrated approach to improving compensation, standards, recruitment, preparation, induction, ongoing professional learning and career development (see below), these have been dismantled – in whole or in part – by political changes. Piecemeal components remain – more of them in some states than in others – but no state offers the full set of financial and programmatic supports we saw in Ontario and Singapore. Federal efforts to support teaching quality have largely been dismantled over the last 15 years, with few supports for financing candidates or programs of teacher education and little investment in mentoring or professional development.

Unfortunately, the United States lacks a systematic approach to recruiting, preparing, and retaining teachers, or for using the skills of accomplished teachers to help improve schools. With unequal resources across states and districts, and few governmental supports for preparation or mentoring, teachers in the U.S. enter:

- With little financial support for their preparation, except in rare circumstances,

- With dramatically different levels of training -- with those least prepared typically teaching the most educationally vulnerable children,
- Earning salaries typically below those of other occupations (about 70-80% of the wage level of other college graduates even after adjusting for work year differences) -- with those teaching the neediest students often earning the least,
- Working under radically different teaching conditions – with those in the most affluent communities benefiting from small classes and a cornucopia of materials, equipment, specialists, and supports, while those in the poorest communities often teach much larger classes, without adequate books and supplies,
- With little time for collaboration and uneven access to on-the-job mentoring or professional learning to help improve their skills (Darling-Hammond, 2012)

Still, the United States has been a leader in many areas. It was the initial source for articulating professional teaching standards in the 1980s, with the creation of the National Board for Professional Teaching Standards, which outlined standards for accomplished teaching and developed performance-based assessments to measure whether teachers could demonstrate those skills. In addition, more than 40 states have adopted related teaching standards for beginning teacher licensure developed by the Interstate New Teacher Assessment and Support Consortium.

These standards and the idea they could be used as a means to guide preparation, appraisal, feedback, and practice has spread across the globe and is now a feature of virtually all high-performing countries, including the ones we studied. Portfolios and other performance-based assessments for demonstrating competence and teaching strategies are also now a common feature of teacher education internationally, informed by U.S. advances.

Designs for teacher education programs that integrate much more extensive clinical preparation alongside interwoven coursework are also informed by U.S. program models, such as Master of Arts in Teaching models created in flagship up universities during the 1960s and 70s, as well as the pioneering work in Finland. We note, for example, that teacher educators in Singapore, Australia, Canada, China, and many other countries have visited U.S. programs, like those at Stanford, Bank Street College, Teachers College and other well-known graduate-level programs, and took specific ideas back to their programs to incorporate.

Program Features that Matter

Effective teacher education and mentoring programs exist in the U.S. and have been studied in terms of their outcomes regarding teacher preparedness and efficacy, employer ratings, entry and retention rates, and student learning gains. Two studies of highly-rated and highly-effective preparation programs that looked at program features (Darling-Hammond et al., 2006; Boyd, Grossman, Lankford, Loeb, & Wyckoff, 2009) identified similar features, including:
- Significant coursework in content and content pedagogical learning;
- A focus on helping candidates learn specific practices that they apply in classrooms where they are practice teaching alongside their coursework;
- Carefully-selected student teaching experiences, well-matched to the contexts in which candidates will later teach;
- Opportunities to study specific content curriculum;
- A capstone project -- typically a portfolio of work done in classrooms with students.

Other studies reinforce these findings (for a summary, see Darling-Hammond & Bransford, 2005), suggesting that candidates who have more opportunity to *study and apply subject-specific teaching methods* are more effective, and that the *quality, duration, and timing of clinical experiences* also appears to matter. Candidates appear to learn more from their fieldwork and coursework when they have opportunities to connect their coursework in real time to practice opportunities in the classroom. The care with which placements are chosen, the quality of practice that is modeled, the duration of the experience, and the quality and frequency of mentoring candidates receive also influence candidates' learning. And graduates who have trained in well-designed partnership schools--those that have managed to create a shared practice between the school and the university curriculum—tend to feel more knowledgeable and prepared to teach, and are rated as better prepared than other new teachers.

Despite this knowledge, and a substantial number of programs that have adopted these practices and developed strong preparation, the quality of teacher education in the United States is highly variable. For more than a century, efforts to professionalize teaching have contended with initiatives to reduce teachers' preparation through entry pathways that aim instead to be quick and cheap. The lack of funding for teacher education candidates in the U.S. is a major part of this problem, given that candidates must go into debt to enter a low-paying profession. This tug-of-war has played out in recent years as new, more sophisticated models of preparation have emerged at the same time as backdoor routes into teaching have proliferated.

Policy Strategies

The most significant reforms to professionalize teaching in the U.S. were launched in the late-1980s through the late 1990s. Policy initiatives aimed to design professional standards, strengthen teacher education and certification, increase investments in mentoring and professional development, and transform roles for teachers.

Both Connecticut and North Carolina eliminated perennial teacher shortages and improved teacher quality through similar strategies, reminiscent of what we saw in many high-achieving countries. Both states increased and equalized salaries across districts, so that all districts could compete in the marketplace for high-quality teachers, while strengthening teacher education and raising licensing standards to ensure more adequate background in content, pedagogy, and knowledge for teaching diverse learners. North Carolina required all public universities to achieve national accreditation and funded professional development schools. Connecticut strengthened state approval, extended clinical training, and required a master's degree for a professional license. In this way, supply and quality were improved simultaneously.

Both states instituted service scholarships and forgivable loans targeted to individuals preparing to teach in high-demand fields, and strong mentoring programs to keep new teachers in classrooms. Both also invested in extensive professional development for teachers and principals, aiming to create more productive school environments where strong instruction could flourish. North Carolina also adopted a groundbreaking performance-based salary increase—12 percent of base salary—for teachers who achieved National Board Certification – a process of demonstrating accomplished teaching that is associated with greater teacher effectiveness.

Both states experienced steep gains in achievement and reductions in the achievement gap on the National Assessment of Educational Progress, with Connecticut becoming the top-ranked state in the nation after a decade of these investments, and North Carolina posting the largest gains overall and for minority and low-income students of any state during that same

period of time (Darling-Hammond, 2010).   A comprehensive study of North Carolina's teaching workforce also found that student achievement gains were significantly greater for students whose teachers were National Board Certified, as well as for those whose teachers had completed, before entry, the pre-service preparation programs the state's strategic policy investments had leveraged (Clotfelter, Ladd, & Vigdor, 2010).

Nonetheless, during the 2000s, federal incentives and many states' policies introduced a competing agenda to replace the traditional elements of professions--formal preparation, licensure, certification, and accreditation--with market mechanisms that allow more open entry to teaching, without the need to raise or equalize salaries or worry about how teachers could afford to be well-prepared. Advocates of this perspective have argued that teaching does not require highly-specialized knowledge and skill, and that such skills as there are can be learned largely on the job.

As a result of this bimodal approach, prospective teachers in the U.S. may enter with only a few weeks of training before entry, or they may enter through undergraduate or graduate pre-service programs of varying designs and durations. These programs – more than 1200 of them across the country -- differ in structure, content, and quality – and they are regulated differently across the 50 states. The content of courses can be dissimilar across venues and may or may not be connected to a clinical experience. Candidates may experience no student teaching or more than 30 weeks; they might be placed in a school with teachers who "need the extra help" but are not role models for skillful practice, or they might be placed in a professional development school that closely models highly effective practices that are taught in companion courses. As a result of this variability, it is difficult to generalize about teacher education in the United States.

The same is true of mentoring programs and on-going professional learning opportunities. A number of US studies have found that well-designed mentoring programs improve retention rates for new teachers, as well as their attitudes, feelings of efficacy, and instructional skills (for a review, see Ingersoll & Strong, 2011). Those with the best outcomes combine having a trained mentor teacher in the same subject area with released time to provide in-classroom coaching, a reduced teaching load, supportive conversations with the principal, seminars on key issues, and regularly scheduled collaboration and planning time with other teachers (Ingersoll & Strong, 2011). While some excellent programs exist – and are the basis for these studies – as of 2012, the most recent year national data are available, only one-third of U.S. beginners had access to the set of supports described above (Sutcher et al., 2016, in press).

Furthermore, the funding for these programs has been cut in many states in recent years as a function of shrinking budgets, and services have decreased. For example, those working with a mentor and supported by conversations with the principal dropped from 75% to only 59% between 2008 and 2012 (Sutcher et al., in press). Consequently, beginning teachers' access to high-quality mentoring and induction is much more variable than it was a few years ago.

And we know from a growing body of research that professional development that is sustained over time, grounded in collegial work around curriculum development and teaching practices in specific content areas; followed by immediate opportunities to apply these practices, often with peer coaching as a support; and refined by reflecting with others on student work and outcomes, has produced student achievement gains that were significantly greater than those of comparison group teachers (for summaries see Darling-Hammond et al., 2009; Yoon, Duncan, Lee, Scarloss, & Shapley, 2007).

Yet national data show that during the NCLB era, the opportunities for teachers to engage in sustained professional learning opportunities (i.e. professional development of

more than 8 hours in duration) declined, and was increasingly focused on the least effective models of professional development: short-term workshops that research suggests are unlikely to influence practice and student achievement. While 90% of teachers experienced these, fewer than 25% of U.S. teachers engaged in more extended professional learning of the duration recommended by research (Wei et al., 2010, pp. A-58-59.)

By the end of the decade only 16 percent of teachers reported that their schools engaged in collaborative efforts – a decline of more than half since 2000 (when 34 percent did so). This should not be surprising: Data from the first Teaching and Learning International Survey (TALIS) indicate that American teachers spend more time working directly with children (27 hours per week) than those in any other OECD nation and have less time for planning or collaboration. The TALIS average is 19 hours a week with children – fully 8 hours less – which allows much more time for job-embedded professional learning, peer coaching, and collaboration (OECD, 2014).

In brief, the U.S. leads the world in research on what matters and what works in teacher development, and American educators have planted many excellent programs that are comparable to – and often have informed – exemplary work abroad. However, the American political system has lacked the capacity to create and sustain a system for supporting teaching quality in consistent, coherent, and equitable ways. Why that is true and how it might be changed is the topic for a different article.

To be sure, there are some states that have worked harder and more systematically at this agenda through many administrations and with little federal support; some have sustained this work for a length of time (although almost always experiencing pushbacks that undermine gains and require them to be refought). These states have developed more complete and better implemented systems of professional learning and support from which we can and should learn. As U.S. educators and researchers continue to work on these issues, our findings from international analyses suggest it is important to focus attention on the study of teaching and learning *systems* that address recruitment, compensation, preparation, induction, and professional learning in supportive working conditions that, together, create a strong profession. It is also important to learn how to sustain and scale up excellent initiatives, once they have been developed and proven, with policies that make them commonplace rather exceptions that may come and go. Without a greater focus on system-building, we are likely to innovate our way to failure, rather than to success.

References

Barber, M., & Mourshed, M. (2007). *How the world's best-performing school systems come out on top*. London: McKinsey & Company.

Boyd, D. J., Grossman, P. L., Lankford, H., Loeb, S., & Wyckoff, J. (2009). Teacher preparation and student achievement. *Educational Evaluation and Policy Analysis*, *31*(4), 416–440.

Campbell et al. (add full cite)

Clotfelter, C. T., Ladd, H. F., & Vigdor, J. L. (2010). Teacher credentials and student achievement in high school a cross-subject analysis with student fixed effects. *Journal of Human Resources*, *45*(3), 655–681.

Darling-Hammond, L. (2006). *Powerful teacher education: Lessons from exemplary programs.* San Francisco: Jossey-Bass.

Darling-Hammond, L. (2010). *The Flat World and Education: How America's commitment to equity will determine our future*. New York: Teacher College, Columbia University.

Darling-Hammond, L. (2012). Teacher Preparation and Development in the United States: A Changing Policy Landscape. In L. Darling-Hammond & A. Lieberman (Eds.), *Teacher Education Around the World: Changing Policies and Practices* (pp. 130–150). New York, N.Y.: Routledge.

Darling-Hammond, L. (2013). *Developing and Sustaining a High-Quality Teaching Force* (Global Cities Education Network). Stanford, CA: Stanford Center for Opportunity Policy in Education. Retrieved from https://edpolicy.stanford.edu/sites/default/files/publications/developing-and-sustaining-high-quality-teacher-force.pdf

Darling-Hammond, L., & Bransford, J. (Eds.). (2005). *Preparing teachers for a changing world: What teachers should learn and be able to do.* San Francisco: Jossey-Bass.

Darling-Hammond, L., Burns, D., Campbell, C., Goodwin, A. L., Hammerness, K., Lieberman, A., Low, E.E., MacIntyre, A., Sato, M., Zeichner, K. (2017). *Empowered Educators: How Leading Nations Design Systems for Teaching Quality*. San Francisco, CA: Jossey-Bass.

Darling-Hammond, L., Ruth Chung Wei, Nikole Richardson, Alethea Andree, and Stelios Orphanos (2009). Professional Learning in the Learning Profession: A Status Report on Professional Development in the U.S. and Abroad. Washington DC: National Staff Development Council and Stanford, CA: School Redesign Network at Stanford University.

Directions Evidence and Policy Research Group. (2014). *The Elementary Teachers' Federation of Ontario (ETFO) Teacher workload and professionalism study*. Vancouver, Canada: Directionx Evidence and Research Policy Group. Retrieved from http://www.edu.gov.on.ca/eng/policyfunding/memos/nov2014/ETFO_TeacherWorkload Report_EN.pdf

Ingersoll, R. M., & Strong, M. (2011). The Impact of Induction and Mentoring Programs for Beginning Teachers: A Critical Review of the Research. *Review of Educational Research*, *81*(2), 201–233. http://doi.org/10.3102/0034654311403323

Low et al. [Add full cite]

Banks, C. A., & Banks, J. A. (1995). Equity pedagogy: An essential component of multicultural education. *Theory into Practice*, *34*(3), 152–158.

OECD. (2014). *TALIS 2013 Results: An International Perspective on Teaching and Learning*. OECD Publishing. Retrieved from http://dx.doi.org/10.1787/9789264196261-en

Ontario College of Teachers. (2011). *Transition to Teaching 2011: Early-Career Teachers in Ontario Schools*. Toronto, Ontario: Ontario College of Teachers. Retrieved from http://www.oct.ca/-/media/PDF/Transition%20to%20Teaching%202011/EN/transitions11_e.ashx

Ontario College of Teachers. (2012). *Transition to Teaching 2012: Teachers face tough entry-job hurdles in an increasingly crowded Ontario employment market*. Toronto, Canada. Retrieved from http://www.oct.ca/-/media/PDF/Transition%20to%20Teaching%202012/T2T%20Main%20Report_EN_web_accessible0313.ashx

Ontario Ministry of Education. (2010). *Growing Success: Assessment, Evaluation, and Reporting in Ontario Schools*. Toronto. Retrieved from https://www.edu.gov.on.ca/eng/policyfunding/growSuccess.pdf

Tucker, M. (2011). Surpassing Shanghai.

Wei, R. C., Darling-Hammond, L., & Adamson, F. (2010). *Professional development in the United States: Trends and challenges*. Dallas, TX: National Staff Development Council.

Yoon, K. S., Duncan, T., Lee, S. W.-Y., Scarloss, B., & Shapley, K. L. (2007). Reviewing the Evidence on How Teacher Professional Development Affects Student Achievement. Issues & Answers. REL 2007-No. 033. *Regional Educational Laboratory Southwest (NJ1)*. Retrieved from http://eric.ed.gov/?id=ED498548

---

[1] The seven jurisdictions are: Singapore and Finland, the states of New South Wales and Victoria in Australia, the provinces of Alberta and Ontario in Canada, and the province of Shanghai in China.

[2] This section draws on Campbell et al. (2017, in press). [Title] San Francisco: Jossey-Bass.

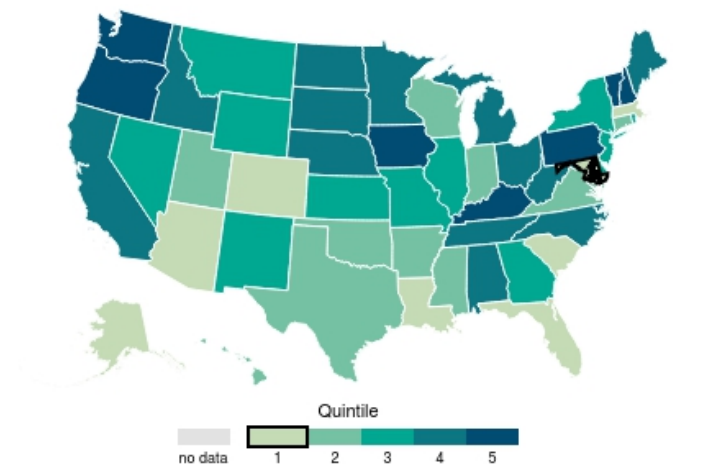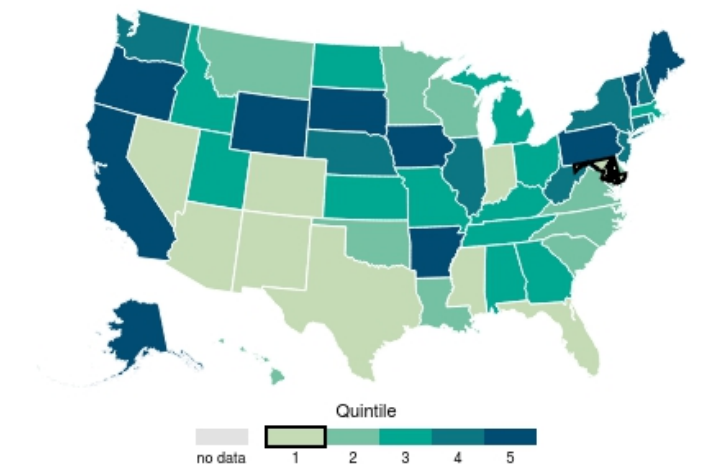[3] http://www.oise.utoronto.ca/ite/Home

[4] This section draws on Low et al., (2017, in press). [Title]. San Francisco: Jossey-Bass.

Maryland: Understanding Teacher Shortages

This map highlights a number of key factors that reflect and influence teacher supply and attrition and signal whether states are likely to have an adequate supply of qualified teachers to fill their classrooms. Based on these data - which treat compensation, teacher turnover, working conditions, and qualifications - each states is assigned a "teaching attractiveness rating," indicating how supportive it appears to be of teacher recruitment and retention and a "teacher equity rating", indicating the extent to which students, in particular students of color, are assigned uncertified or inexperienced teachers. Ratings are on a 1-5 scale, with 1 (the lightest color) being the least desirable and 5 (the darkest color) being the most desirable.

Teaching Attractiveness Rating: 2.18

Quintile — no data — 1 2 3 4 5

Teacher Equity Rating: 2.2

Quintile — no data — 1 2 3 4 5

Indicator	MD	US Average
Compensation Rating	**4.5**	
Starting Salary	$43,235	$36,141
Wage Competitiveness	75	74
Working Conditions Rating	**1.6**	
Pupil-Teacher Ratio	15 : 1	16 : 1
Classroom Autonomy	59%	77%
Collegiality Within School	26.9%	38%
Testing-Related Job Insecurity	15%	12%
Administrative Support	41%	48%
Teacher Qualifications Rating	**1**	
% Inexperienced Teachers	14.3%	12.6%
% Uncertified Teachers	3.16%	1.89%
Teacher Turnover Rating	**2.5**	
Left Profession	n/a	7.7%
Left School or Profession	11.9%	14.2%
Plans to Leave Teaching	10.9%	6.6%

Indicator	MD	US Average
Ratio of Uncertified Teachers in High- vs. Low-Minority Schools	**11.97 : 1**	**4.05 : 1**
% Uncertified Teachers in Low-Minority Schools	0.5%	0.88%
% Uncertified Teachers in High-Minority Schools	6%	3.56%
Ratio of Inexperienced Teachers in High- vs. Low-Minority Schools	**3.75 : 1**	**1.67 : 1**
% Inexperienced Teachers in Low-Minority Schools	6.78%	9.9%
% Inexperienced Teachers in High-Minority Schools	25.39%	16.56%
% Teachers of color	**17%**	**18%**

The data are drawn from national data sources, representing the most recent data available for analysis. Interpretations of the data should keep in mind that, depending on the specific statistic, these sources are from 2012, 2013, or 2014. Some states may have recently experienced changes in policies or conditions which would change the statistic reported if it were collected today. In addition, in some cases, sample sizes are relatively small. We do not report data for states where the samples are too small to meet NCES guidelines for reporting. Complete notes and source information are available at http://learningpolicyinstitute.org/understanding-teacher-shortages-notes-sources.

Definitions and Sources

Teaching Attractiveness Rating: The average quintile rank (1-5) of each indicator in the categories compensation, teacher turnover, working conditions, and teacher qualifications.

Compensation Rating: The average quintile rank (1-5) of starting salary and salary competitiveness.

Starting Salary: Average starting salary in 2013. *Source: NEA Collective Bargaining/Member Advocacy's Teacher Salary Database, based on affiliate reporting as of December 2013, see http://www.nea.org/home/2012-2013-average-starting-teacher-salary.html.*

Wage Competitiveness: Estimated annual teacher wage as percentage of estimated annual non-teacher wage, holding constant age, education level, and hours worked. *Source: Baker B., Farrie D., & Sciarra D.G. (2016). Mind the gap: 20 years of progress and retrenchment in school funding and achievement gaps, Table 5. Educational Testing Service: Princeton, NJ. pp. 15.*

Working Conditions Rating: The average quintile rank (1-5) of administrative support, testing-related job insecurity, collegiality, teacher autonomy, and pupil-teacher ratios.

Pupil-Teacher Ratio: Pupil-Teacher Ratio in 2014. *Source: National Center for Education Statistics. (2015). Digest of Education Statistics. Public and private elementary and secondary teachers, enrollment, pupil/teacher ratios, and new teacher hires: Selected years, fall 1955 through fall 2025. Washington, D.C.: U.S. Department of Education.*

Classroom Autonomy: Percentage of teachers who report they have control in their classroom in the following areas of planning and teaching: textbooks and class materials, content and skills to be taught, teaching techniques, evaluating students, discipline, and homework. *Source: LPI analysis of the Public School Teacher File, 2012, from the Schools and Staffing Survey, National Center for Education Statistics.*

Collegiality Within School: Percentage of teachers who strongly agree that there is a great deal of cooperative effort among the staff members. *Source: LPI analysis of the Public School Teacher File, 2012, from the Schools and Staffing Survey, National Center for Education Statistics.*

Testing-Related Job Insecurity: Percentage of teachers who strongly agree that they worry about the security of their job because of the performance of their students or school on state and/or local tests. *Source: LPI analysis of the Public School Teacher File, 2012, from the Schools and Staffing Survey, National Center for Education Statistics.*

Administrative Support: Percentage of teachers who strongly agree that their school administration's behavior toward the staff is supportive and encouraging. *Source: LPI analysis of the Public School Teacher File, 2012, from the Schools and Staffing Survey, National Center for Education Statistics.*

Teacher Qualifications Rating: The average quintile rank (1-5) of uncertified teachers and inexperienced teachers.

% Inexperienced Teachers: Percentage of first- and second-year teachers in 2014. *Source: LPI analysis of the Civil Rights Data Collection, Public-Use Data File 2013-14, National Center for Education Statistics.*

% Uncertified Teachers: Percentage of teachers who have not met state certification requirements in 2014, including those teaching while still finishing their preparation, or teaching with an emergency-style credential. *Source: LPI analysis of the Civil Rights Data Collection, Public-Use Data File 2013-14, National Center for Education Statistics.*

Teacher Turnover Rating: The average quintile rank (1-5) of plans to leave teaching, left profession, and left school or profession.

Left Profession: Percentage of teachers who left the teaching profession between the 2011-12 school year and the 2012-13 school year, also known as "leavers." *Source: LPI analysis of the Teacher Follow-Up Survey, 2013, from the Schools and Staffing Survey, National Center for Education Statistics.*

Left School or Profession: Percentage of teachers who moved schools or who left the teaching profession between the 2011-12 school year and the 2012-13 school year, also known as "movers and leavers." *Source: LPI analysis of the Public School Teacher File, 2012, from the Schools and Staffing Survey, National Center for Education Statistics; Teacher Follow-Up Survey, 2013, from the Schools and Staffing Survey, National Center for Education Statistics.*

Plans to Leave Teaching: Percentage of teachers planning to leave teaching as soon as possible or as soon as a more desirable job opportunity arises. *Source: LPI analysis of the Public School Teacher File, 2012, from the Schools and Staffing Survey, National Center for Education Statistics.*

Ratio of Uncertified Teachers in High- vs. Low-Minority Schools: Percentage of uncertified teachers in high-minority schools / Percentage of uncertified teachers in low-minority schools. *Source: LPI analysis of the Civil Rights Data Collection, Public-Use Data File 2013-14, National Center for Education Statistics.*

Teacher Equity Rating: The average quintile rank (1-5) of the ratio of uncertified teachers in high- vs. low-minority schools, the ratio of inexperienced teachers in high- vs. low-minority schools, uncertified teachers in high-minority schools, uncertified teachers in low-minority schools, inexperienced teachers in high-minority schools, and inexperienced teachers in low-minority schools.

% Uncertified Teachers in Low-Minority Schools: Percentage of teachers in low-minority schools who are not certified. *Source: LPI analysis of the Civil Rights Data Collection, Public-Use Data File 2013-14, National Center for Education Statistics.*

% Uncertified Teachers in High-Minority Schools: Percentage of teachers in high-minority schools who are not certified. *Source: LPI analysis of the Civil Rights Data Collection, Public-Use Data File 2013-14, National Center for Education Statistics.*

Ratio of Inexperienced Teachers in High- vs. Low-Minority Schools: Percentage of inexperienced teachers in high-minority schools / Percentage of inexperienced teachers in low-minority schools. *Source: LPI analysis of the Civil Rights Data Collection, Public-Use Data File 2013-14, National Center for Education Statistics*

% Inexperienced Teachers in Low-Minority Schools: Percentage of first- or second-year teachers in low-minority schools. *Source: LPI analysis of the Civil Rights Data Collection, Public-Use Data File 2013-14, National Center for Education Statistics.*

% Inexperienced Teachers in High-Minority Schools: Percentage of first- or second-year teachers in high-minority schools. *Source: LPI analysis of the Civil Rights Data Collection, Public-Use Data File 2013-14, National Center for Education Statistics.*

% Teachers of color: Percentage teachers of color in 2012. *Source: LPI analysis of the Public School Teacher File, 2012, from the Schools and Staffing Survey, National Center for Education Statistics.*

Complete notes and sources at http://learningpolicyinstitute.org/understanding-teacher-shortages-notes-sources

Maryland Elementary Teacher Preparation Programs

Maryland Commission on Innovation and Excellence in Education
January 9, 2017
Rob Rickenbrode

National Council on Teacher Quality

NCTQ

- Non-partisan research and advocacy non-profit founded in 2000.

- Dedicated to the vision of an excellent teacher in front of every child

- Focused policy and institutional improvement

- Work at federal, state, district, and local levels

- Key projects:
  - State Policy Yearbook
  - Teacher Contract Database
  - Teacher Preparation Review

Teacher Prep Review: Why?

Learning gains or losses of average student

Legend:
- Traditionally certified
- Alternatively certified
- Uncertified
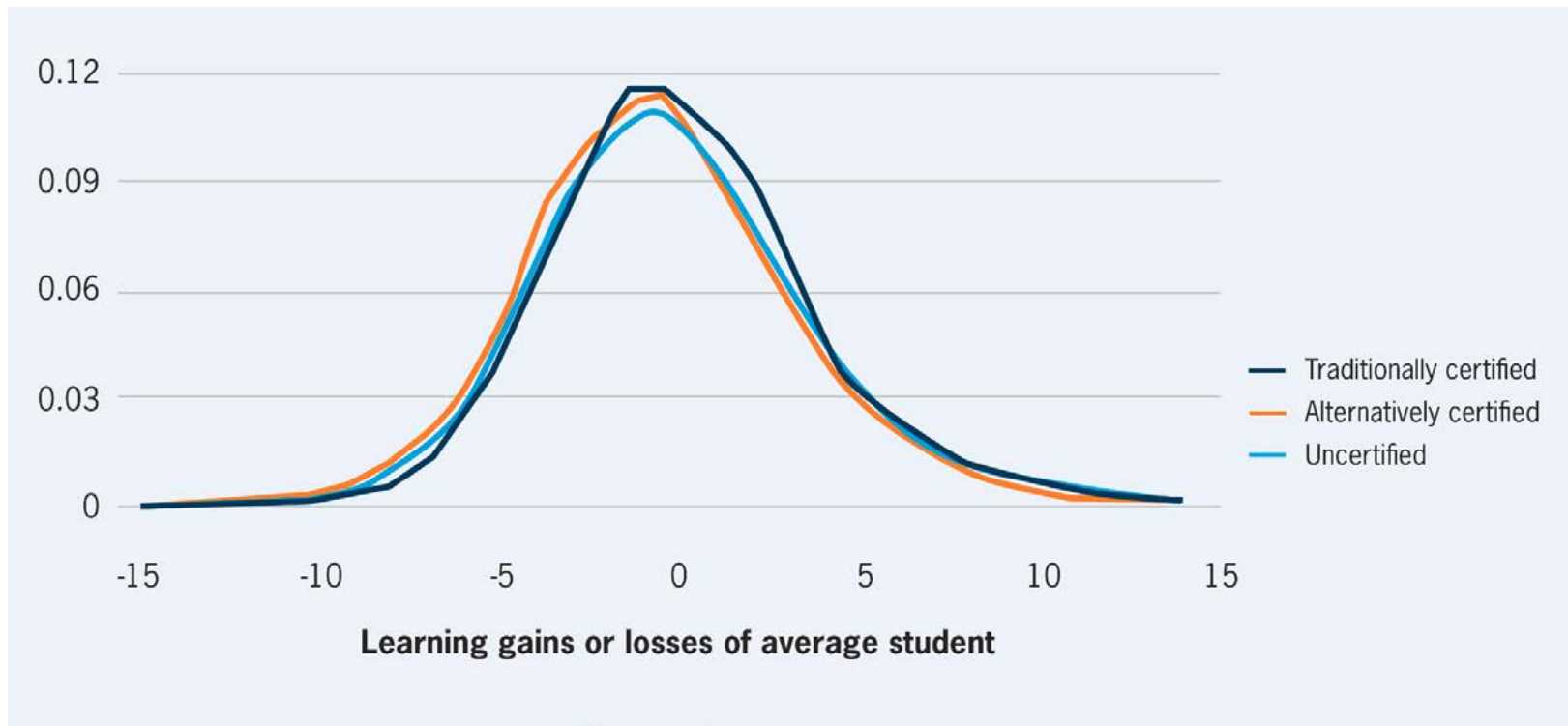
Teacher Prep Review: Strategy

- Provide indicators of key design elements
  - 2,500 teacher preparation programs
  - 1,200 universities and alternative certification providers (24 in Maryland)

- Applies the same set of standards
  - Specific to elementary, secondary, and special education
  - At both undergraduate and graduate levels
  - Developed over a decade

- First publication in 2013. Updated and expanded in 2014.

- Most recent release - undergraduate elementary programs in December 2016.

Teacher Prep Review: Strategy

UNDERGRADUATE ELEMENTARY

2016 Rating

University of Maryland - College Park

NATIONAL PERCENTILE:

98

College Park, Maryland

Enrollment: 37610 Graduates: 335
Degree: Bachelor of Science in Elementary Education with Certification

Admissions

Selection Criteria	A+

Knowledge

Early Reading	A
Elementary Mathematics	A
Elementary Content	D

Practice

Student Teaching	D
Classroom Management	C

ratings notes:

Programs which meet the requirements for an A and also meet additional, related criteria earn an A+.

Pass/Not Pass scores are earned where we have sufficient, but incomplete, evidence.

Blank scores indicate that we were either unable to obtain sufficient data or the information that we obtained was inconclusive.

You can see this program's scores in previous editions of the *Teacher Prep Review*:
2014 edition
2013 edition

Teacher Prep Review: Standards

Key Areas

1. Admissions
   Are potential teachers very capable academically?

2. Subject matter knowledge
   Do potential teachers know the subjects they will be teaching?

3. Practice
   Do potential teachers have sufficient, structured practice with expert feedback?

Teacher Prep Review: Elementary

Admissions
Are potential teachers very capable academically?

Undergraduate

- Is the university selective? (Above average SAT/ACT scores or Barron's rating)

- Is the education department selective? (Above average SAT/ACT scores for admitted students, high GPA admissions requirements, high average GPA of admitted students)

Graduate

- Is the program selective? (High GPA admissions requirements, high average GPA of admitted students, requires GRE or similar test; requires an audition)

Teacher Prep Review: Elementary

Subject Matter Knowledge
Do potential teachers know the subjects they will be teaching?

For elementary teachers this includes:

- A broad liberal arts background
  - These folks typically teach all subjects

- Specific topics focused on teaching children mathematics
  - These folks need to know how to explain invert and multiply for fraction division

- How to teach reading
  - These folks have this awesome responsibility

Specifically…

Teacher Prep Review: Elementary

Subject Matter Knowledge
Do potential teachers know the subjects they will be teaching?

A broad liberal arts background means college-level coursework (or equivalent) in:

- World literature, American literature, composition, and children's literature

- Early American history, modern American history/government, ancient world history, modern world history, and geography

- Biology, chemistry, and physics/physical science/earth science (hopefully with one or more lab sections

Teacher Prep Review: Elementary

Subject Matter Knowledge
Do potential teachers know the subjects they will be teaching?

Specific topics focused on teaching children mathematics means several college-level courses (or equivalent) focused on topics such as:

- Numbers and operations (systems, place-value, decimals, algorithms, fractions, decimals)

- Algebra (variables, equations, graphs & functions)

- Geometry (measurement, plane geometry, polygons, circles, perimeter, area, volume)

- Data and statistics (average, mode, probability, graphs)

Teacher Prep Review: Elementary

Subject Matter Knowledge
Do potential teachers know the subjects they will be teaching?

How to teach reading means college-level courses (or equivalent) with extensive instruction on the Big Five components of early reading:

- Phonemic awareness (hearing the sounds that make up English)

- Phonics (mapping between sound and written symbols)

- Fluency (ability to reading accurately, quickly, and expressively)

- Vocabulary

- Reading comprehension

Teacher Prep Review: Elementary

Practice
Do potential teachers have sufficient, structured practice with expert feedback?

For ALL teachers this includes:

- A semester-long student teaching experience in a classroom with an effective teacher (who is also a capable mentor) with regular, structured feedback

- That feedback includes guidance on five elements of classroom management (setting behavior expectations; maintaining and managing engagement, time, materials, environment; using praise; managing minor misbehavior; managing severe misbehavior.)

Teacher Prep Review: Elementary

To sum up for elementary:

Key Area	Standards
Admissions	Selection criteria
Subject matter knowledge	Elementary reading
	Elementary math
	Elementary content
Practice	Student teaching
	Classroom management

Teacher Prep Review: Highlights

- Slightly fewer than half of programs are selective in admissions
  - College Park earned strong design for being selective and relatively diverse

- Slightly fewer than half of programs cover all 5 early reading components
  - Most cover phonics, vocabulary, and comprehension
  - Half cover phonemic awareness and fluency

- One-third adequately address the topics of elementary mathematics

Teacher Prep Review: Highlights

- Only one program earns an "A" in elementary content (seeking to ensure broad liberal arts knowledge)
  - Most address composition and children's literature; none require an adequate American literature course
  - History/geography and the sciences are inadequately addressed by the majority of programs (typically by giving candidates too many course options or options inadequate for preparing future elementary teachers)

- No program earns an "A" in student teaching
  - A majority of programs require at least 4 observations
  - No program ensures that the cooperating teachers are BOTH effective themselves and able to mentor novice teachers

Teacher Prep Review: Highlights

- Only able to review 4 programs for classroom management
  - Only one of those enables feedback on five elements of classroom management in all student teaching observations

Teacher Prep Review: Policy Context

- Drawn from NCTQ's 2015 State Policy Yearbook Database

- Admissions
  - Maryland requires neither standardized test nor GPA requirement for teacher prep admissions
  - Except for a subset of institutions which must be accredited by CAEP (enrollment of 2,000 or more)

- Elementary Reading
  - The state does not require teacher candidates to pass an assessment that measures knowledge of scientifically based reading instruction prior to certification or at any point thereafter.
  - The state requires 12 credit hours of courses that should cover the five essential components of early reading

Teacher Prep Review: Policy Context

- Elementary Mathematics
  - The required Instructional Practice and Applications test does not adequately address the topics necessary for elementary mathematics
  - Maryland requires elementary teaching candidates to earn at least 12 semester hours of credit in mathematics. However, the state stipulates neither the requisite content of these classes nor that they must meet the needs of elementary teachers.

- Elementary Content
  - The state does not require a licensure test on elementary *content* (required Instructional Practice and Applications test focuses on pedagogy)
  - Prospective teachers must complete a major in interdisciplinary studies OR an academic field taught in elementary education OR have at least 48 semester hours of content course work

Teacher Prep Review: Policy Context

- Student Teaching
  - In Maryland, either a supervised experience or a year's worth of successful full-time teaching
  - The state does not articulate any requirements for cooperating teachers

Want to learn more?

Rob Rickenbrode

Senior Managing Director, Teacher Preparation Strategies

National Council on Teacher Quality

rrickenbrode@nctq.org

202-393-0020 x106

Adequacy of Education Funding in Maryland

**Presentation to the Commission on
Innovation and Excellence in Education**

**Department of Legislative Services
Office of Policy Analysis
Annapolis, Maryland**

January 9, 2017

Presentation Overview

- Adequacy Targets

- Adequacy in Fiscal 2002, 2008, and 2015

- Progress toward Adequate Funding

- Federal, State, and Local Funding

- Slowing Progress; Federal, State, and Local

- Comparing Actual Funding to Targets and Augenblick, Palaich and Associates (APA) Proposal

Adequacy Targets

- Adequacy: Funding should be sufficient to acquire the total resources needed to reasonably expect that **all** students can meet academic performance standards

- The Department of Legislative Services' calculation of adequacy targets:
  - Base per pupil cost of $5,969 in fiscal 2002 inflated by implicit price deflator (IPD) for State and local government expenditures.
  - Foundation program adjusted by regional cost index (GCEI)
  - Additional costs for at-risk students

    - Special education student: 1.17 x base per pupil cost
    - Economically disadvantaged student: 1.10 x base per pupil cost
    - Limited English proficient student: 1.00 x base per pupil cost

Fiscal 2002 Adequacy Analysis

| County | ($ in Millions) | | | Per Pupil | | | Percent of |
	Adequacy Target	Adjusted Revenue*	Adequacy Gap**	Adequacy Target	Adjusted Revenue*	Adequacy Gap	Adequacy Funded**
Allegany	$100.6	$78.3	$22.3	$10,171	$7,913	$2,258	77.8%
Anne Arundel	607.2	563.6	43.6	8,198	7,610	589	92.8%
Baltimore City	1,141.4	871.0	270.4	12,087	9,224	2,864	76.3%
Baltimore	924.0	858.8	65.2	8,879	8,252	627	92.9%
Calvert	128.5	117.7	10.8	7,876	7,214	662	91.6%
Caroline	53.3	36.3	17.0	9,885	6,737	3,149	68.1%
Carroll	210.9	191.0	19.9	7,554	6,839	715	90.5%
Cecil	133.7	109.6	24.1	8,562	7,017	1,545	82.0%
Charles	194.9	164.8	30.1	8,387	7,092	1,295	84.6%
Dorchester	47.0	36.1	10.9	10,138	7,792	2,346	76.9%
Frederick	294.6	262.0	32.6	7,891	7,017	874	88.9%
Garrett	45.5	36.3	9.2	9,601	7,659	1,942	79.8%
Harford	316.2	264.8	51.4	8,095	6,779	1,316	83.7%
Howard	348.7	376.3	0.0	7,639	8,243	0	107.9%
Kent	25.0	24.1	0.9	9,697	9,361	336	96.5%
Montgomery	1,203.4	1,288.7	0.0	8,953	9,587	0	107.1%
Prince George's	1,352.1	968.3	383.8	10,236	7,330	2,906	71.6%
Queen Anne's	57.2	52.3	4.9	8,163	7,468	696	91.5%
St. Mary's	126.4	107.8	18.6	8,528	7,270	1,258	85.3%
Somerset	30.1	24.8	5.3	10,365	8,524	1,842	82.2%
Talbot	38.3	32.7	5.6	8,784	7,510	1,274	85.5%
Washington	173.7	143.2	30.5	8,880	7,323	1,557	82.5%
Wicomico	128.9	101.2	27.7	9,198	7,224	1,974	78.5%
Worcester	59.6	57.1	2.5	8,949	8,569	380	95.7%
State Total	**$7,741.2**	**$6,766.7**	**$1,087.4**	**$9,207**	**$8,048**	**$1,293**	**86.0%**

*Selected Financial Data, Fiscal 2002, Maryland State Department of Education. Figures exclude unallocated revenues and revenues spent on student transportation and other revenues not linked to adequacy.

**State total excludes funding that exceeds adequacy targets.

Fiscal 2002 Adequacy Summary

- There was a statewide adequacy gap of nearly $1.1 billion

- Statewide, adequacy was funded at 86.0%

- Four counties achieved 95.0% or above funding of their adequacy targets; including Howard and Montgomery which exceeded their targets

- Another five counties were funded at more than 90.0% of their adequacy targets

- Seven counties were funded at less than 80.0% of adequacy

Fiscal 2008 Adequacy Analysis

| County | ($ in Millions) | | | Per Pupil | | | Percent of |
	Adequacy Target	Adjusted Revenue*	Adequacy Gap**	Adequacy Target	Adjusted Revenue*	Adequacy Gap	Adequacy Funded**
Allegany	$110.7	$118.4	$0.0	$12,307	$13,165	$0	107.0%
Anne Arundel	745.6	823.4	0.0	10,385	11,469	0	110.4%
Baltimore City	1,172.0	1,177.7	0.0	15,095	15,168	0	100.5%
Baltimore	1,157.3	1,193.4	0.0	11,509	11,867	0	103.1%
Calvert	165.8	184.5	0.0	9,736	10,836	0	111.3%
Caroline	64.1	57.5	6.6	11,975	10,742	1,232	89.7%
Carroll	264.7	299.1	0.0	9,451	10,680	0	113.0%
Cecil	168.3	169.5	0.0	10,673	10,747	0	100.7%
Charles	261.3	286.1	0.0	10,097	11,055	0	109.5%
Dorchester	54.4	51.7	2.7	12,258	11,642	616	95.0%
Frederick	401.4	438.3	0.0	10,141	11,072	0	109.2%
Garrett	50.8	49.7	1.1	11,545	11,307	239	97.9%
Harford	390.3	417.3	0.0	10,191	10,896	0	106.9%
Howard	461.4	633.1	0.0	9,497	13,031	0	137.2%
Kent	26.2	27.7	0.0	12,158	12,870	0	105.9%
Montgomery	1,550.1	1,922.4	0.0	11,510	14,275	0	124.0%
Prince George's	1,605.7	1,526.1	79.6	13,043	12,396	646	95.0%
Queen Anne's	74.0	75.6	0.0	9,892	10,099	0	102.1%
St. Mary's	172.6	171.2	1.4	10,704	10,619	84	99.2%
Somerset	35.2	36.4	0.0	12,875	13,297	0	103.3%
Talbot	44.9	44.3	0.6	10,607	10,473	134	98.7%
Washington	242.0	233.6	8.4	11,418	11,023	394	96.5%
Wicomico	171.8	165.1	6.7	11,929	11,466	463	96.1%
Worcester	69.7	89.8	0.0	10,920	14,068	0	128.8%
State Total	**$9,460.3**	**$10,192.0**	**$106.9**	**$11,554**	**$12,447**	**$131**	**98.9%**

*Selected Financial Data, Fiscal 2008, Maryland State Department of Education. Figures exclude unallocated revenues and revenues spent on student transportation and other revenues not linked to adequacy.

** State total excludes funding that exceeds adequacy targets.

Fiscal 2008 Adequacy Summary

- There was a statewide adequacy gap of $106.9 million.

- Statewide, adequacy was funded at 98.9%.

- All but one county (Caroline) achieved 95.0% or more of their adequacy targets; including 16 that exceeded their targets.

Fiscal 2015 Adequacy Analysis

County	($ in Millions)			Per Pupil			Percent of
	Adequacy Target	Adjusted Revenue*	Adequacy Gap**	Adequacy Target	Adjusted Revenue*	Adequacy Gap	Adequacy Funded**
Allegany	$131.5	$117.6	$13.9	$15,735	$14,066	$1,669	89.4%
Anne Arundel	1,075.3	983.1	92.2	13,882	12,692	1,190	91.4%
Baltimore City	1,587.1	1,297.0	290.1	19,755	16,144	3,611	81.7%
Baltimore	1,634.3	1,400.9	233.4	15,396	13,197	2,199	85.7%
Calvert	194.9	205.7	0.0	12,466	13,155	0	105.5%
Caroline	85.4	66.2	19.2	16,135	12,514	3,621	77.6%
Carroll	313.8	315.6	0.0	12,298	12,368	0	100.6%
Cecil	218.7	188.9	29.8	14,641	12,648	1,993	86.4%
Charles	348.8	332.0	16.8	13,721	13,062	660	95.2%
Dorchester	75.6	61.4	14.2	16,496	13,401	3,094	81.2%
Frederick	525.9	490.1	35.8	13,253	12,350	902	93.2%
Garrett	53.1	50.0	3.1	14,313	13,468	845	94.1%
Harford	493.8	438.7	55.1	13,431	11,932	1,499	88.8%
Howard	651.1	790.8	0.0	12,390	15,047	0	121.4%
Kent	30.5	28.9	1.6	15,482	14,680	802	94.8%
Montgomery	2,274.3	2,199.1	75.2	15,129	14,629	500	96.7%
Prince George's	2,230.9	1,678.8	552.1	18,301	13,772	4,529	75.3%
Queen Anne's	97.9	88.4	9.5	13,088	11,820	1,269	90.3%
St. Mary's	226.5	201.7	24.8	13,349	11,887	1,462	89.0%
Somerset	47.7	41.1	6.6	17,453	15,047	2,407	86.2%
Talbot	64.0	52.0	12.0	14,639	11,884	2,755	81.2%
Washington	323.0	279.2	43.8	14,834	12,822	2,012	86.4%
Wicomico	230.9	184.1	46.8	15,868	12,654	3,214	79.7%
Worcester	90.9	104.7	0.0	14,488	16,693	0	115.2%
State Total	**$13,005.9**	**$11,595.9**	**$1,576.0**	**$15,396**	**$13,727**	**$1,866**	**87.9%**

*Selected Financial Data, Fiscal 2015, Maryland State Department of Education. Figures exclude unallocated revenues and revenues spent on student transportation and other revenues not linked to adequacy.

**State total excludes funding that exceeds adequacy targets.

7

Fiscal 2015 Adequacy Summary

- There was a statewide adequacy gap of $1.6 billion.

- Statewide, adequacy was funded at 87.9%.

- Six counties achieved 95.0% or above funding of their adequacy targets; including four that exceeded their targets.

- Another five counties were funded at more than 90.0% of their adequacy targets.

- Three counties were funded at less than 80.0% of adequacy.

Fiscal 2002 to 2008 Progress

County	Adequacy Gap ($ in Millions)			Adequacy Gap Per Pupil			Percent of Adequacy Funded		
	FY 2002	FY 2008	Progress	FY 2002	FY 2008	Progress	FY 2002	FY 2008	Progress
Allegany	$22.3	$0.0	$22.3	$2,258	$0	$2,258	77.8%	107.0%	29.2%
Anne Arundel	43.6	0.0	43.6	589	0	589	92.8%	110.4%	17.6%
Baltimore City	270.4	0.0	270.4	2,864	0	2,864	76.3%	100.5%	24.2%
Baltimore	65.2	0.0	65.2	627	0	627	92.9%	103.1%	10.2%
Calvert	10.8	0.0	10.8	662	0	662	91.6%	111.3%	19.7%
Caroline	17.0	6.6	10.4	3,149	1,232	1,916	68.1%	89.7%	21.6%
Carroll	19.9	0.0	19.9	715	0	715	90.5%	113.0%	22.5%
Cecil	24.1	0.0	24.1	1,545	0	1,545	82.0%	100.7%	18.7%
Charles	30.1	0.0	30.1	1,295	0	1,295	84.6%	109.5%	24.9%
Dorchester	10.9	2.7	8.1	2,346	616	1,731	76.9%	95.0%	18.1%
Frederick	32.6	0.0	32.6	874	0	874	88.9%	109.2%	20.3%
Garrett	9.2	1.1	8.2	1,942	239	1,704	79.8%	97.9%	18.2%
Harford	51.4	0.0	51.4	1,316	0	1,316	83.7%	106.9%	23.2%
Howard	0.0	0.0	N/A	0	0	N/A	107.9%	137.2%	29.3%
Kent	0.9	0.0	0.9	336	0	336	96.5%	105.9%	9.3%
Montgomery	0.0	0.0	N/A	0	0	N/A	107.1%	124.0%	16.9%
Prince George's	383.8	79.6	304.2	2,906	646	2,259	71.6%	95.0%	23.4%
Queen Anne's	4.9	0.0	4.9	696	0	696	91.5%	102.1%	10.6%
St. Mary's	18.6	1.4	17.3	1,258	84	1,173	85.3%	99.2%	14.0%
Somerset	5.3	0.0	5.3	1,842	0	1,842	82.2%	103.3%	21.0%
Talbot	5.6	0.6	5.0	1,274	134	1,140	85.5%	98.7%	13.2%
Washington	30.5	8.4	22.1	1,557	394	1,162	82.5%	96.5%	14.1%
Wicomico	27.7	6.7	21.0	1,974	463	1,511	78.5%	96.1%	17.6%
Worcester	2.5	0.0	2.5	380	0	380	95.7%	128.8%	33.1%
State Total	**$1,087.4**	**$106.9**	**$980.4**	**$1,293**	**$131**	**$1,163**	**86.0%**	**98.9%**	**12.9%**

Fiscal 2002 to 2008 Progress

- Statewide, the adequacy gap was narrowed by $980.4 million in fiscal 2008; nearly all of the gap since 2002.

- The adequacy gap was eliminated in 14 counties.

- In 14 other counties, the per pupil gap was reduced by more than $1,000.

- In another six counties, the per pupil gap was reduced by more than $500.

- The percentage of adequacy funded increased to almost 100%.

Fiscal 2002 to 2015 Progress

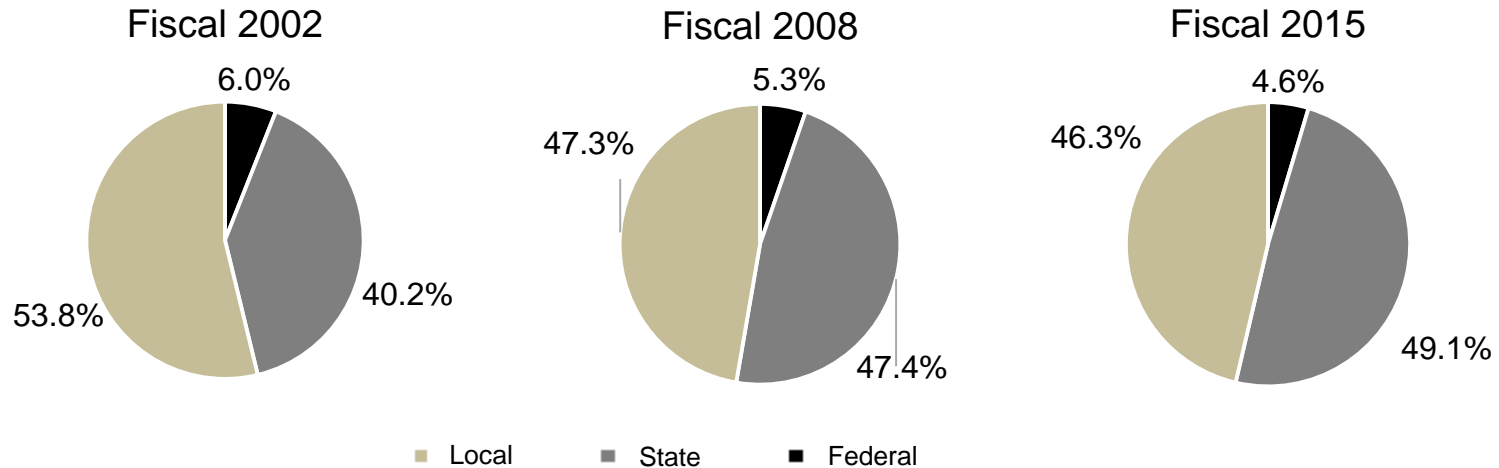| County	Adequacy Gap ($ in Millions)			Adequacy Gap Per Pupil			Percent of Adequacy Funded		
	FY 2002	FY 2015	Progress	FY 2002	FY 2015	Progress	FY 2002	FY 2015	Progress
Allegany	$22.3	$13.9	$8.4	$2,258	$1,669	$589	77.8%	89.4%	11.6%
Anne Arundel	43.6	92.2	-48.6	589	1,190	-602	92.8%	91.4%	-1.4%
Baltimore City	270.4	290.1	-19.7	2,864	3,611	-748	76.3%	81.7%	5.4%
Baltimore	65.2	233.4	-168.2	627	2,199	-1,572	92.9%	85.7%	-7.2%
Calvert	10.8	0.0	10.8	662	0	662	91.6%	105.5%	13.9%
Caroline	17.0	19.2	-2.2	3,149	3,621	-472	68.1%	77.6%	9.4%
Carroll	19.9	0.0	19.9	715	0	715	90.5%	100.6%	10.0%
Cecil	24.1	29.8	-5.6	1,545	1,993	-447	82.0%	86.4%	4.4%
Charles	30.1	16.8	13.3	1,295	660	636	84.6%	95.2%	10.6%
Dorchester	10.9	14.2	-3.3	2,346	3,094	-748	76.9%	81.2%	4.4%
Frederick	32.6	35.8	-3.2	874	902	-28	88.9%	93.2%	4.3%
Garrett	9.2	3.1	6.1	1,942	845	1,097	79.8%	94.1%	14.3%
Harford	51.4	55.1	-3.7	1,316	1,499	-183	83.7%	88.8%	5.1%
Howard	0.0	0.0	N/A	0	0	N/A	107.9%	121.4%	13.5%
Kent	0.9	1.6	-0.7	336	802	-466	96.5%	94.8%	-1.7%
Montgomery	0.0	75.2	-75.2	0	500	-500	107.1%	96.7%	-10.4%
Prince George's	383.8	552.1	-168.3	2,906	4,529	-1,623	71.6%	75.3%	3.6%
Queen Anne's	4.9	9.5	-4.6	696	1,269	-573	91.5%	90.3%	-1.2%
St. Mary's	18.6	24.8	-6.2	1,258	1,462	-205	85.3%	89.0%	3.8%
Somerset	5.3	6.6	-1.2	1,842	2,407	-565	82.2%	86.2%	4.0%
Talbot	5.6	12.0	-6.5	1,274	2,755	-1,481	85.5%	81.2%	-4.3%
Washington	30.5	43.8	-13.4	1,557	2,012	-455	82.5%	86.4%	4.0%
Wicomico	27.7	46.8	-19.1	1,974	3,214	-1,240	78.5%	79.7%	1.2%
Worcester	2.5	0.0	2.5	380	0	380	95.7%	115.2%	19.5%
State Total	**$1,087.4**	**$1,576.0**	**-$488.6**	**$1,293**	**$1,866**	**-$572**	**86.0%**	**87.9%**	**1.9%**

Fiscal 2002 to 2015 Progress

- Statewide, the adequacy gap increased by $488.6 million in fiscal 2015; nearly half since fiscal 2002.

- In four counties, the per pupil gap increased by more than $1,000.

- In another six counties, the per pupil gap increased by $500 or more.

- On a per pupil basis, six counties gained ground toward filling the gap.

- The percentage of adequacy funded increased by 1.9 percentage points.

School System Funding Trends by Source

Revenue Source	FY 2002 to 2008 Annual % Change	FY 2008 to 2015 Annual % Change	Fiscal 2002 to 2015 Annual % Change
Federal Aid*	4.9%	-0.1%	2.2%
State Aid**	10.2%	2.4%	5.9%
Local Appropriations	4.9%	1.6%	3.1%
Total	**7.2%**	**1.9%**	**4.3%**

* Not including food service.
** Not including unallocated State aid.

Fiscal 2002

6.0%

47.3% 53.8% 40.2%

Fiscal 2008

5.3%

47.3% 47.4%

Fiscal 2015

4.6%

46.3% 49.1%

■ Local   ■ State   ■ Federal

Source: Selected Financial Data

13

Using Different Annual Per Pupil Foundation Amounts

($ per Pupil)

Per Pupil Foundation Amount	Fiscal 2002	Fiscal 2008	Fiscal 2015
Actual*	$4,124	$6,694	$6,860
Full Adequacy Using IPD**	$5,443	$6,694	$8,171
$ Difference	$1,319	$0	$1,311
% Difference	32%	0%	19%
Full Adequacy Using Lesser of CPI-U and IPD***	$5,443	$6,694	$7,639
$ Difference	$1,319	$0	$779
% Difference	32%	0%	11%

*Actual reflects statutory changes made after the enactment of the Bridge to Excellence in Public Schools Act of 2002 that altered the per pupil foundation amounts in fiscal 2009 through 2015.

**Fiscal 2009 through 2015 are inflated annually by the actual implicit price deflator (IPD) for State and local government expenditures.

***Fiscal 2009 through 2015 are inflated by the lesser of IPD or the Consumer Price Index for All Urban Consumers for the Washington-Baltimore metropolitan area (CPI-U) capped at 5% annually.

State Education Aid Using Different Per Pupil Foundation Amounts

($ in Millions)

	FY 2008	FY 2009	FY 2010	FY 2011	FY 2012	FY 2013	FY 2014	FY 2015
Actual State Aid*	$4,170.0	$4,276.5	$4,324.2	$4,439.4	$4,509.2	$4,621.2	$4,747.1	$4,869.6
IPD (actual)**	4,170.0	4,449.5	4,724.9	4,858.2	5,063.4	5,318.6	5,489.4	5,712.1
Difference vs. Actual	**$0.0**	**-$173.1**	**-$400.7**	**-$418.8**	**-$554.2**	**-$697.4**	**-$742.3**	**-$842.4**
Lesser of CPI-U and IPD***	4,170.0	4,363.5	4,571.0	4,700.6	4,811.1	5,058.2	5,217.2	5,349.6
Difference vs. Actual	**$0.0**	**-$87.0**	**-$246.8**	**-$261.2**	**-$301.9**	**-$437.1**	**-$470.1**	**-$479.9**

*Actual reflects statutory changes made after the enactment of the Bridge to Excellence in Public Schools Act of 2002 that altered the per pupil foundation amounts in fiscal 2009 through 2015.

**Fiscal 2009 through 2015 are inflated annually by the implicit price deflator (IPD) for State and local government expenditures.

***Fiscal 2009 through 2015 are inflated by the lesser of IPD or the Consumer Price Index for All Urban Consumers for the Washington-Baltimore metropolitan area (CPI-U) capped at 5% annually.

Fiscal 2015 State and Local Funding – Actual, Target, and APA Proposed
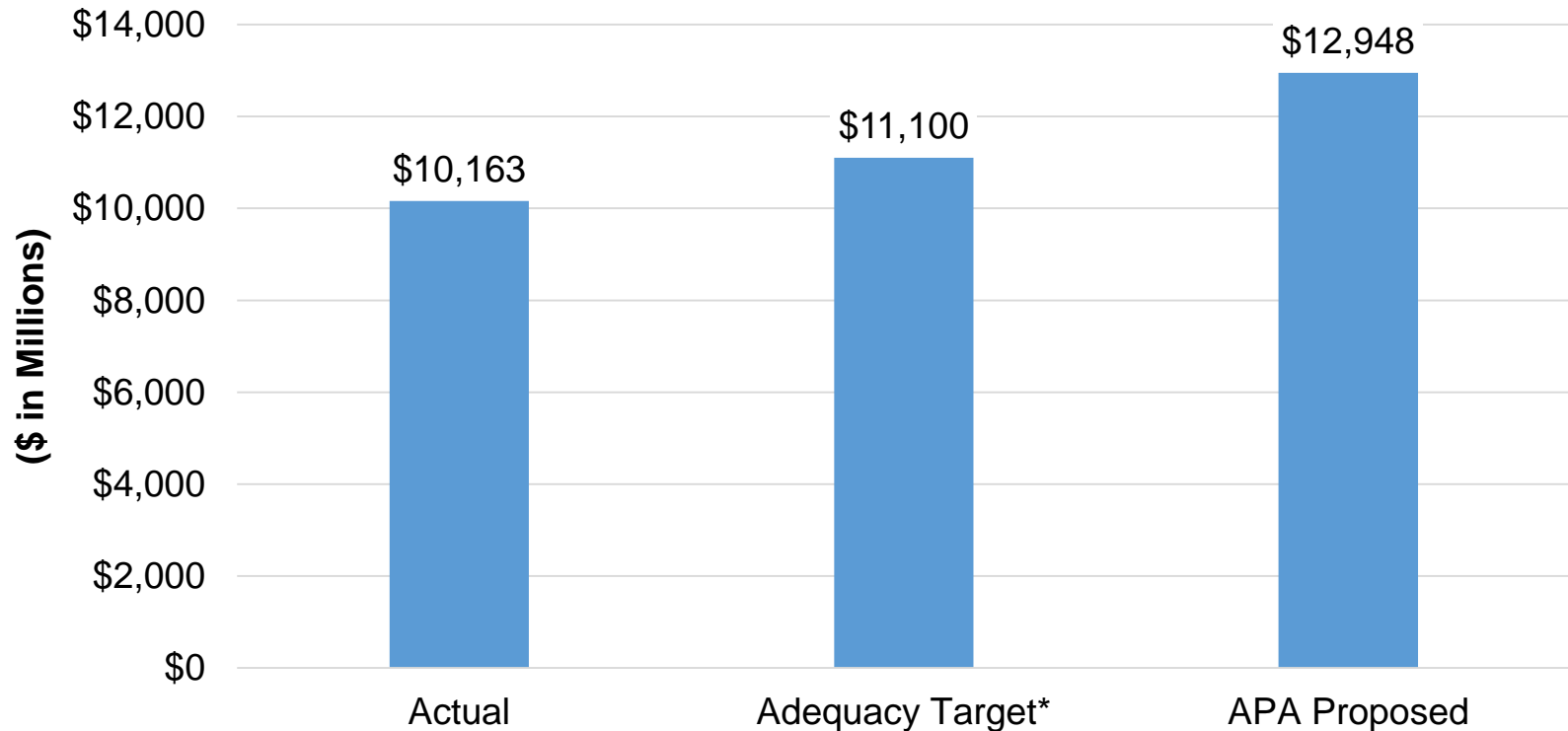
Note: For comparability, all funding excludes transportation, retirement, and other funding not associated with adequacy. Also excludes federal funds.

*Target weights for compensatory education, limited English proficiency, and special education aid formulas are adjusted for federal funds.

Source: Department of Legislative Services

Appendix

State Aid Trend

County	($ in Millions)			Average Annual % Change	
	FY 2002	**FY 2008**	**FY 2015**	**2002 to 2008**	**2008 to 2015**
Allegany	$47.9	$88.9	$85.2	10.8%	-0.6%
Anne Arundel	203.2	313.0	396.2	7.5%	3.4%
Baltimore City	584.3	889.8	982.9	7.3%	1.4%
Baltimore	308.3	572.1	684.6	10.9%	2.6%
Calvert	49.7	94.7	96.5	11.4%	0.3%
Caroline	24.5	45.2	53.2	10.7%	2.4%
Carroll	89.4	158.0	156.0	10.0%	-0.2%
Cecil	57.9	107.1	114.9	10.8%	1.0%
Charles	81.4	161.1	184.4	12.0%	1.9%
Dorchester	19.7	33.7	41.6	9.4%	3.0%
Frederick	113.6	222.0	266.9	11.8%	2.7%
Garrett	20.2	28.1	24.5	5.7%	-1.9%
Harford	128.3	231.8	235.1	10.4%	0.2%
Howard	117.6	222.5	281.3	11.2%	3.4%
Kent	9.1	11.7	11.9	4.2%	0.2%
Montgomery	278.5	511.6	787.0	10.7%	6.3%
Prince George's	514.0	995.8	1,104.8	11.7%	1.5%
Queen Anne's	20.9	34.0	39.7	8.5%	2.3%
St. Mary's	52.5	99.2	111.3	11.2%	1.7%
Somerset	13.9	25.6	31.9	10.6%	3.2%
Talbot	7.5	12.9	17.0	9.4%	4.1%
Washington	69.8	147.8	183.9	13.3%	3.2%
Wicomico	54.5	113.7	142.0	13.0%	3.2%
Worcester	11.1	22.4	26.3	12.4%	2.3%
State Total	**$2,877.8**	**$5,142.6**	**$6,059.0**	**10.2%**	**2.4%**

Note: Includes transportation and other State aid programs not linked to adequacy. Excludes unallocated State aid.

Local Funding Trend

County	Local Appropriation ($ in Millions)			Average Annual % Change	
	FY 2002	FY 2008	FY 2015	2002 to 2008	2008 to 2015
Allegany	$26.0	$28.4	$29.4	1.5%	0.5%
Anne Arundel	367.6	514.3	603.5	5.8%	2.3%
Baltimore City	210.3	200.4	254.7	-0.8%	3.5%
Baltimore	546.0	617.9	738.1	2.1%	2.6%
Calvert	68.9	95.4	115.8	5.6%	2.8%
Caroline	10.7	12.3	13.4	2.3%	1.3%
Carroll	107.2	151.1	171.0	5.9%	1.8%
Cecil	50.9	64.4	75.5	4.0%	2.3%
Charles	85.7	135.9	161.9	8.0%	2.5%
Dorchester	14.4	16.7	18.5	2.5%	1.5%
Frederick	149.6	228.4	233.5	7.3%	0.3%
Garrett	15.1	21.9	26.7	6.4%	2.9%
Harford	138.3	199.6	223.7	6.3%	1.6%
Howard	274.5	427.2	530.4	7.6%	3.1%
Kent	13.5	16.2	17.2	3.1%	0.8%
Montgomery	1,030.0	1,449.8	1,476.9	5.9%	0.3%
Prince George's	468.4	584.5	630.2	3.8%	1.1%
Queen Anne's	31.0	43.9	51.2	6.0%	2.2%
St. Mary's	52.5	76.0	93.9	6.4%	3.1%
Somerset	8.7	8.8	9.6	0.2%	1.3%
Talbot	24.1	31.7	35.3	4.7%	1.6%
Washington	69.6	85.6	94.8	3.5%	1.5%
Wicomico	43.7	49.4	40.4	2.1%	-2.8%
Worcester	44.5	66.7	77.7	7.0%	2.2%
State Total	**$3,851.1**	**$5,126.4**	**$5,723.5**	**4.9%**	**1.6%**

Source: Selected Financial Data

Federal Funding Trend

County	($ in Millions)			Average Annual % Change	
	FY 2002	FY 2008	FY 2015	2002 to 2008	2008 to 2015
Allegany	$9.0	$8.6	$10.4	-0.7%	2.7%
Anne Arundel	28.0	39.3	41.9	5.8%	0.9%
Baltimore City	125.0	138.2	119.8	1.7%	-2.0%
Baltimore	40.2	65.8	64.2	8.6%	-0.4%
Calvert	6.3	6.9	8.5	1.7%	2.9%
Caroline	3.8	4.4	4.6	2.4%	0.8%
Carroll	8.6	10.7	11.1	3.7%	0.5%
Cecil	7.2	7.9	10.0	1.7%	3.5%
Charles	8.0	11.8	12.1	6.6%	0.4%
Dorchester	4.2	5.2	5.5	3.7%	0.8%
Frederick	11.6	14.3	16.5	3.6%	2.0%
Garrett	4.2	4.1	3.9	-0.4%	-0.7%
Harford	14.9	16.9	19.2	2.2%	1.8%
Howard	9.5	17.2	19.5	10.4%	1.8%
Kent	2.9	2.3	2.2	-3.3%	-0.9%
Montgomery	43.8	77.3	74.0	9.9%	-0.6%
Prince George's	59.0	88.5	84.2	7.0%	-0.7%
Queen Anne's	3.9	4.1	4.7	1.2%	1.7%
St. Mary's	10.0	10.8	14.0	1.4%	3.7%
Somerset	3.9	5.1	3.8	4.5%	-4.3%
Talbot	3.0	2.7	3.4	-1.7%	3.6%
Washington	9.0	12.8	16.4	6.2%	3.5%
Wicomico	8.2	10.8	12.3	4.7%	1.9%
Worcester	5.1	6.6	7.7	4.5%	2.2%
State Total	**$429.1**	**$572.6**	**$569.9**	**4.9%**	**-0.1%**

Source: Selected Financial Data. Excludes food service funding.
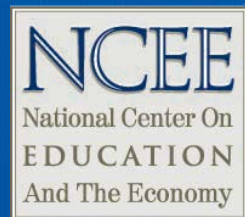
October Meeting

- At your Oct. meeting we:
  - Analyzed what makes top performing international education systems successful,
  - Compared those systems to US student outcomes and policies, and
  - Summed up our findings in the *9 Building Blocks for World-Class Education Systems.*

NCEE's Gap Analysis

- Based on the *9 Building Blocks* Framework and working with the State Department of Education, Higher Education, and other relevant agencies, NCEE will:
  - Look at how Maryland's policies and practices compares to top performing jurisdictions nationally and internationally on the *9 Building Blocks and*
  - Analyze that information and present it to you as you deliberate on where you hope to see Maryland's education system going in the next decade.

Timeline

- This work takes approximately **three months** and includes updating our international data now that both TIMSS and PISA have been released.

- Top performing countries have moved ahead in new areas, such as Singapore's approach to student-centered and problem-based learning or Massachusetts' efforts to develop teacher career advancement systems.

- And, of course, we will gather the most up to date Maryland information in collaboration with the state.

What We Expect to Find

- Our expectation, because Maryland is already such a strong performer, is that the results will help you identify policy priorities building upon the good work and outcomes we already see in the state.
- For example, we know that Maryland's instructional system and high school graduation requirements, compared to other U.S. states is rigorous and comprehensive.
- There has been progress on early childhood education and care.
- Maryland has grown a set of quality pathways to college and career for high school students.

Continuous Improvement

- But the top performers continue to get better.
- They keep setting new and more challenging targets.
- The have continuous improvement systems that enable them to reach those targets.

Continuous Improvement

- The information we will provide the Commission is a deep understanding of what the top US states on NAEP (MA, NH and NJ) and top performers on PISA (Ontario, Canada; Finland; Singapore; and Shanghai) do in each of the Building Blocks as well as their results – in terms of student performance, equity and efficiency – as a consequence of their policies.

Learning from Various Systems

- The top performing systems have not implemented all of the *9 Building Blocks* equally well.

- They use different implementation strategies.

- By looking at multiple systems, a state can see many opportunities to improve both their policies and practices and their implementation strategies.

Other Work from NCEE

- NCEE pioneered this approach to gap analysis when asked by the OECD to do a similar project for the U.S. (*Strong Performers and Successful Reformers*).

- NCEE has also done this sort of gap analysis for the State of Kentucky and is now starting similar projects in Pennsylvania and Indiana.

In Sum

- The gap analysis will only work if the data for Maryland is accurate and up to date. We will be working in collaboration with your state agencies to gather the baseline data for Maryland on each building block.
- We will organize, synthesize and analyze this data against similar data from the top performing states and countries and help you use that data to identify the gaps and establish priorities for Maryland's education system.
- Our plan is to produce interim reports keyed to the topics scheduled for your meetings, so that you can consider the gaps between your performance and the performance of the top performers as you think about what you want for Maryland.

We look forward to working with you

NCSL Elements of World-Class Education Systems

9 Building Blocks for a World-Class Education System

Element #1: Children come to school ready to learn, and extra support is given to struggling students so that all have the opportunity to achieve high standards

Building Block #1: Provide strong supports for children and their families before students arrive at school

Building Block #2: Provide more resources for at-risk students than for others

Element #2: A world-class teaching profession supports a world-class instructional system, where every student has access to highly effective teachers and is expected to succeed

Building Block #3: Develop world-class, highly coherent instructional systems

Building Block #4: Create clear gateways for students through the system, set to global standards, with no dead ends

Building Block #5: Assure an abundant supply of highly qualified teachers

Building Block #6: Redesign schools to be places in which teachers will be treated as professionals, with incentives and support to continuously improve their professional practice and the performance of their students

Building Block #8: Create a leadership development system that develops leaders at all levels to manage such systems effectively

Element #3: A highly effective, intellectually rigorous system of career and technical education is available to those preferring an applied education

Building Block #7: Create an effective system of career and technical education and training

Element #4: Individual reforms are connected and aligned as parts of a clearly planned and carefully designed comprehensive system

Building Block #9: Institute a governance system that has the authority and legitimacy to develop coherent, powerful policies and is capable of implementing them at scale

Prospectus for a

Gap Analysis

Comparing Maryland's Education System to
Top U.S. States and Top-Performing
Jurisdictions Worldwide On Education
Performance, Policies and Practices

January 2017

NCEE
National Center On
EDUCATION
And The Economy

A GAP ANALYSIS FOR THE STATE OF MARYLAND

What follows is a description of a gap analysis to be performed at the request of the Maryland Commission on Innovation and Excellence in Education. The purpose of the gap analysis is to help the Commission to compare the performance of the state's education system to that of the top-performing state education systems in the United States and the top-performing education systems in the world. That comparison will be designed to enable the Commission to identify specific polices and practices Maryland could put in place to achieve results comparable to top performing states and international top performers.

This research and analysis will be performed by the Center on International Education Benchmarking of the National Center on Education and the Economy (NCEE). NCEE has been researching the strategies used by the countries with the best-performing education systems in the world since 1989. In 2011, Arne Duncan, then U.S. Secretary of Education, asked the OECD to prepare a report on the strategies used by the best-performing and most rapidly improving education systems in the world. The OECD turned to NCEE to produce the report. Based on its years of experience in this field, NCEE created a conceptual framework to guide the research and asked the world's leading experts in this field to review the framework. That framework, updated by subsequent research, will be used to guide this gap analysis. A similar project has been conducted in Kentucky and others are underway in Indiana and Pennsylvania.

The logic of the work is straightforward. The conceptual framework is provided in a document titled 9 Building Blocks of a World-Class Education System. Each building block represents an arena of policy and practice in which the top performers pursue similar policies and practices with similar underlying principles. The 9 Building Blocks document describes policies and practices typically found in the high-performing systems. The gap analysis is performed by comparing the target state or country to the top performers world wide on each of the building blocks, using the typical policies and practices as indicators. Thus the question is, how does the target state or country compare to the top performers not just with respect to the outcomes of interest, but also the specific policies and practices used by the top performers to achieve their top positions on the world's education league tables? By asking the question this way, the target state or nation can identify the gaps between its own policies and practices and the policies and practices of the top performers and choose which policies and practices it wants to pursue if it wants to achieve the levels of student achievement and equity reached by the top performers.

This is not a mechanical process. None of the top performers are the best in all of the arenas of interest. All are better at some things than others. All have used implementation strategies different from others. In every case, some options open to a country or state are not open to others that might be interested in matching their outcomes. Virtually no top performer simply copies another. Adaptation is always the order of the day. And the top performers are always looking across countries and states, taking one thing from one country and something else from another. Because they want these things to work in harmony with one another, they are always adapting what they see in another country or state for use in their own, not only to

make it fit with their values, history and politics, but also so that it will fit with the other things they are borrowing. So the development of strategy is always a matter of judgment.

But it could not be clearer that the top performers are where they are in part because they put a lot of effort into constantly benchmarking their most able competitors, for the same reason that businesses and atheletes do the same thing. The surest way to fall behind the state-of-the-art is to be unaware of what it is.
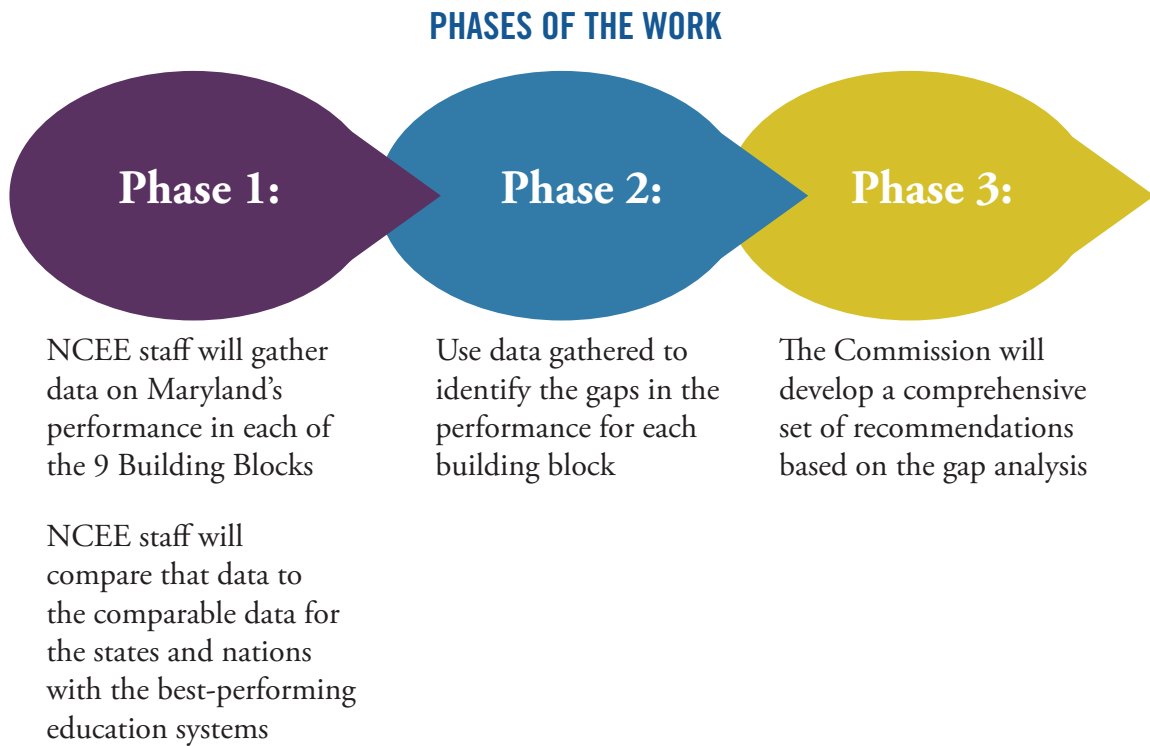
THE STRUCTURE OF THIS DOCUMENT

This document is organized into five major parts:

- A description of how the gap analysis will be done;
- A list of the nine building blocks for a world-class state education system;
- An overview of how the indicators for the 9 building blocks were chosen;
- An explanation of how benchmark jurisdictions were selected for comparison with Maryland;
- An overview of the benchmarked jurisdictions, with a table of comparative data;
- A full list of the key indicators for each of the nine building blocks.

NCEE'S GAP ANALYSIS PROCESS

Researchers at the National Center on Education and the Economy have been studying the strategies used by the countries with the best education systems for more than a quarter of a century. They have identified 9 Building Blocks for a World-Class Education System. Not all of the best-performing countries are equally strong in all of these areas, but, again and again, the researchers have seen that the stronger a country or a state is in these arenas, the more likely it is that they will find a very high performing system.

Between January and April 2017, NCEE staff will be engaged in gathering data on Maryland's performance in each of the 9 Building Blocks, comparing that data to the comparable data for the states and nations with the best-performing education systems. That information will be used to identify the gaps in the performance for each building block, and that information, in turn, will be used by the Commission to develop a comprehensive set of recommendations to position Maryland to be a world leader in the global economy and to enable its citizens to enjoy broadly shared prosperity for many years to come.

PHASES OF THE WORK

Phase 1:

Phase 2:

Phase 3:

NCEE staff will gather data on Maryland's performance in each of the 9 Building Blocks

NCEE staff will compare that data to the comparable data for the states and nations with the best-performing education systems

Use data gathered to identify the gaps in the performance for each building block

The Commission will develop a comprehensive set of recommendations based on the gap analysis

THE NINE BUILDING BLOCKS FOR A WORLD-CLASS STATE EDUCATION SYSTEM

The following nine points summarize what NCEE has learned about the steps that top performing country, state and provincial education systems have taken to get to the top of the world's education league tables:

1. Provide strong supports for children and their families before students arrive at school;

2. Provide more resources for at-risk students that need additional help;

3. Develop world-class, highly coherent instructional systems;

4. Create clear gateways for students through the system, set to global standards, with no dead ends;

5. Assure an abundant supply of highly competent teachers with the necessary dispositions, knowledge and skills;

6. Redesign schools to be places in which teachers, as professionals, work collaboratively with incentives and support to continuously improve their professional practice and the performance of their students;

7. Create an effective system of career and technical education and training;

8. Create a leadership development system that develops leaders at all levels to manage such systems effectively; and

9. Institute a governance system that has the authority and legitimacy to develop coherent, powerful policies and is capable of implementing them at scale.

KEY INDICATORS OF SUCCESS

NCEE has identified key indicators for each of the 9 Building Blocks that will enable Maryland to compare itself to the countries and American states with the most effective education systems. These indicators are listed in full at the end of this document. After these indicators have been discussed and the data to support them has been documented with help from the corresponding state agencies, a gap analysis will be conducted by NCEE to help the Commission understand where Maryland stands on each indicator, how far it has to go to meet the targets represented by each indicator.

WHICH STATES AND COUNTRIES IS MARYLAND BEING COMPARED TO? WHY THESE STATES AND COUNTRIES?

NCEE chose jurisdictions for comparison on the basis of data collected by the Organization for European Cooperation and Development (OECD) by their Programme on International Student Assessment (PISA). This is the largest and most highly regarded comparative survey of student performance in the world. It is intended to measure not what students can recall from the curriculum they have studied, but what they can do with what they have learned. It is therefore the best data available anywhere on the kind of learning that is useful to young people as they enter the workforce. These surveys measure student achievement in mathematics, reading and science. NCEE took the most recent data for each of these subjects and, taking an average of national performance in all three subjects, constructed a league table of national performance, identifying the top performers. We then took two of the top performing countries from Asia (China and Singapore), one from North America (Canada) and one from Europe (Finland) for the comparisons with Maryland. These choices were intended to produce a set of countries very different from each other in national culture, type of government, structure of the education system and so on. What unifies these countries is their top performance. Finally, because China and Canada are very large countries that delegate a great deal of education policymaking to their provinces and municipalities, we chose two high performing jurisdictions from within those countries – Ontario in Canada and Shanghai in China – for the purpose of comparing to a state the size of Maryland. Although our analysis includes background on the governance and history of Canada and China at large, for the most part we compare Maryland to the policies and practices of Shanghai and Ontario specifically.

NCEE also chose three states for comparison to Maryland. These states are the three top achievers on the National Assessment of Education Progress (NAEP), the survey that the United States uses to compare student achievement across the states. Massachusetts, New Jersey and New Hampshire scored at or near the top in performance across subject areas, both reading and math, and grade levels, both fourth and eighth grade.

The benchmark international jurisdictions (Shanghai, China; Singapore; Finland and Ontario, Canada) all scored at or near the top out of 70 jurisdictions in reading, mathematics and science on the 2015 PISA examinations and were specifically chosen to represent different models of education system design and governance models, all of which are highly successful.

NAEP 2013 8th Grade
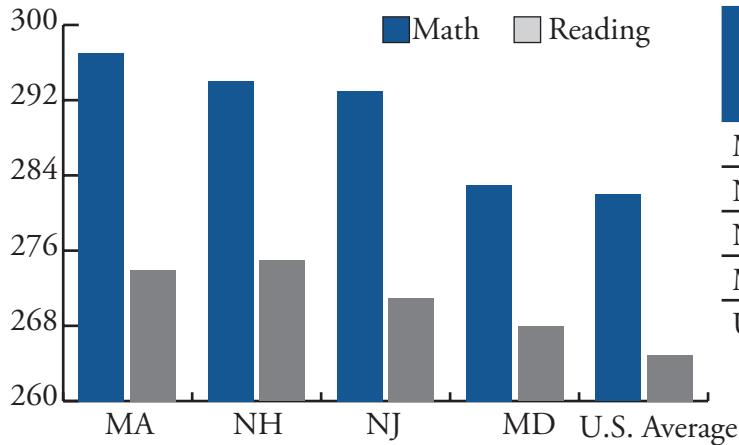
State	Math Score	Reading Score	Science Score*
MA	297	274	162
NH	294	275	165
NJ	293	271	156
MD**	283	268	155
U.S. Average	282	265	155

*The NAEP Science exam, administered in 2015, has a substantially smaller sample size compared to the Reading and Math exams. Therefore, less weight was given to science results when selecting benchmark states.

**Maryland was ranked 26th in mathematics, 15th in reading, and 26th in science for NAEP 2015 for 8th grade.

PISA 2015
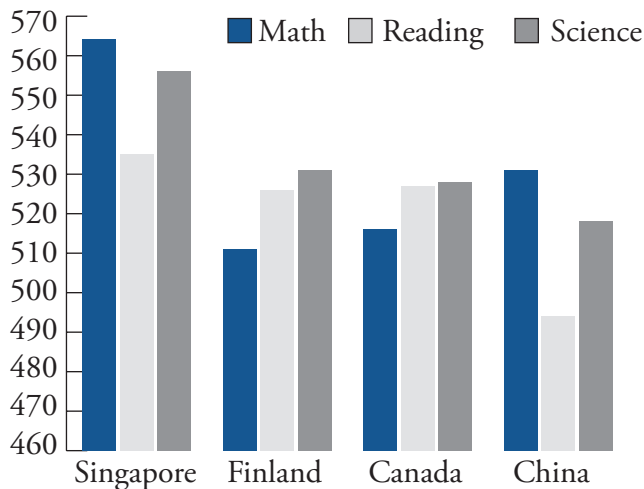
Country	Math Score	Reading Score	Science Score
Singapore	564	535	556
Finland	511	526	531
Canada **	516	527	528
China *	531	494	518
Average from 70 Participating Countries	490	493	493
United States	470	497	497

* Scores for China include four provinces: Shanghai (the province described in the gap analysis), Guangdong, Beijing, and Jiangsu.
** Scores for Canada include all provinces. This gap analysis focuses on the province of Ontario for the purposes of comparison with a U.S. state.

AN OVERVIEW OF MARYLAND AND THE BENCHMARKED JURISDICTIONS

Maryland's future depends on becoming a much stronger economic competitor within an ever-expanding circle of states and nations. To meet the challenges of an increasingly interconnected, knowledge-driven global economic landscape—and in so doing preserve the quality of life and well-being of its residents—Maryland must build the systems and processes to produce a highly skilled workforce. Failing to do so may not be immediately catastrophic, but the long-term impact of the status quo's incremental progress in these key areas will be felt

nonetheless through a slow slide toward economic and wage stagnation across the state and increasing poverty for a steadily growing number of Maryland's citizens.

The chart that follows this analysis offers an at-a-glance understanding of key attributes and characteristics of each of the comparison jurisdictions. Maryland ranks 3rd among U.S. states in terms of innovation and entrepreneurship, making it among the most competitive states. In addition, its per capita GDP is similar to the top performing states and is a bit higher than that of the top performing international jurisdictions even when accounting for parity of purchasing power. The challenge for Maryland is whether it can maintain this edge into the future. Maryland has consistently ranked in the middle or slightly above average in measures of student proficiency such as NAEP. But above average is, as the chart shows, still below the top of the U.S. rankings and far below the world's education leaders. The data show not only that the average U.S. high school student scores very poorly relative to high school students in other countries, but also that American millennials in the workforce are not only among the least well educated in the industrial world, they are less well educated than they used to be. Maryland's economic prospects, if it is indeed producing new workers with skills below those of a growing number of other countries and producing workers whose skills now rank near the bottom of the rankings of the workers in all the industrialized countries, are worrisome indeed.

Well-documented links exist between socioeconomic status and academic achievement and Maryland's poverty rate—10.3 percent—puts it squarely in the middle of domestic comparison jurisdictions. However, deep and widespread poverty has not prevented Shanghai and Singapore from creating education systems capable of topping the world's league tables. Indeed, China, Ontario and Singapore have relative poverty rates well above Massachusetts, New Hampshire, New Jersey and Maryland, but their students now substantially out-perform students in the U.S. states.

Maryland has the highest rate—by a wide margin—of students meeting the federal Free and Reduced Lunch (FRL) income requirements of the comparison states, while Shanghai and Singapore have much higher rates of student poverty than both Finland and Ontario. The rate of FRL is even higher in Baltimore, at over 80 percent. It should be noted that the FRL threshold for need is higher than that used for the poverty rate in the U.S., with 49.6 percent of school children qualifying for FRL and only 23 percent of school children meeting the poverty definition. Given that distinction, it it likely that both Shanghai and Singapore would have proportions of FRL-eligible, low-income students higher than Maryland's.

The broader demographic make-up of the jurisdictions shows wide variations, but also substantial similarities. New Hampshire, Shanghai and Finland have more demographically homogenous populations than Maryland and the rest of the comparison jurisdictions, while New Jersey, Massachusetts, Singapore and Ontario—all of which outperform Maryland—have more diverse populations resembling Maryland's. That being said, while New Hampshire may be homogeneous, it has by far the largest proportion of its population living in rural areas— around 40 percent.

At 6.5 percent, Maryland's proportion of students who are non-native English speakers is below the figures for both Massachusetts and New Jersey, but much higher than New Hampshire's 2 percent. Of the international jurisdictions, only Finland has a percentage of foreign-born students—a proxy for non-native speakers for the international jurisdictions—that is in the single digits. Both Ontario and Singapore have much higher rates of foreign-born students and China faces similar linguistic diversity with migrant students a significant proportion of its school population. This linguistic diversity, frequently seen as a challenge unique to U.S. schools, has not prevented those top performing jurisdictions from rapidly improving their education systems.

Understanding the student body of the comparison jurisdictions is critical, but so too is the actual organization of that student body. While Finland and Singapore have smaller total student populations than Maryland's 880,000, when the number of schools in each jurisdiction is taken into account, a very different picture emerges. With 1,442 schools in the state, Maryland's average school size is 610 students. With only 365 schools, Singapore's average school population is by far the largest—1430 students—while Finland's average school population is by far the smallest at just 162 students per school. Maryland's 610 average school size is similar to Massachusetts' and New Jersey's average school populations, 514 and 540 students respectively.

Education spending as a percentage of gross domestic product is fairly similar across all jurisdictions, between 3.5 and 4.2 percent, with New Jersey—5 percent—and Singapore—2.8 percent—as outliers on the high and low ends respectively. Annual per pupil spending, on the other hand, varies widely. At $13,829, Maryland spends more per pupil than the U.S. average ($10,700), and slightly less than top performing state Massachusetts ($14,515). But both Maryland and the domestic comparison jurisdictions get very different returns on their investments than the international top performers. Singapore—a jurisdiction that spends only $7,862 per pupil—and Finland – only $9,180 – have the highest secondary school completion rates by significant margins (99 and 93 percent, respectively), while the U.S. jurisdictions—including Maryland—and Ontario have completion percentages in the mid-80s. With respect to education attainment, Ontario and Massachusetts have the highest percentage of adults with higher education degrees or diplomas and Shanghai and Singapore have the lowest. However, the rates of higher education completion in Shanghai and Singapore – jurisdictions that have dramatically rebuilt their education systems within the lifetimes of most of the adults currently working – are rising rapidly.

The benchmark jurisdictions are at once exceedingly different and at the same time possess striking similarities. Many of the comparison jurisdictions have risen from extremely challenging and disadvantaged positions to their current place at the top of the league tables for student performance. Their experience and progress, despite those obstacles, demonstrate that a country, state, or city, committed to the proposition that its future is inextricably linked to the rapid improvement of its education system can reverse its fortunes and build the high-skill, innovation-centered economy necessary to compete globally.

Demographic Data	Maryland	Massachusetts	New Hampshire	New Jersey	U.S.	Shanghai	Singapore	Finland	Ontario
Population (2015)[1]	6.0 million	6.8 million	1.3 million	8.9 million	316 million	23.9 million	5.4 million	5.4 million	13.6 million
Ethnic Makeup (2015)[2]	52% White, 31% African American, 9% Hispanic, 7% Asian	74% White, 11% Hispanic, 8% African American, 7% Asian	91% White, 3% Hispanic, 3% Asian, 2% African American	56% White, 20% Hispanic, 15% African American, 10% Asian	64% White, 16% Hispanic, 13% African American, 5% Asian, 2% Other	92% Han Chinese, 8% Other	77% Chinese, 14% Malay, 8% Indian, 1.4% Other	93% Finn, 6% Swede, .5% Russian, .3% Estonian, .1% Roma, .1% Sami	28% British, 23% French, 15% Other European, 2% Native, 32% Other
Percent of Population Living in Rural Areas (2010)[3]	12.8%	8.00%	39.70%	5.32%	19.30%	10.70%	0%	16%	14% (2011)
Relative Poverty Rate (Percent of Population Below 50% Median Income)[4] (China 2015, Singapore 2011, Ontario, U.S. and Finland 2010)	No Data	No Data	No Data	No Data	17%	16%* (China)	26%	7%	13.9%
Absolute Poverty Rate (2012)[5]	10.3%	11.9%	10%	10.8%	16%	No Data	No Data	No Data	No Data
Economic Data									
GDP (2016 in current dollars)[6]	$372 billion	$485 billion	$75 billion	$580 billion	$16.7 trillion	$352 billion	$339 billion	$260 billion	$695 billion
GDP (in comparable USD$ using purchasing power parity of PPP) for 2013[7]	No data	No data	No data	No data	$16.7 trillion	$436 billion	$298 billion	$242 billion	$862 billion
Composition of Economy (U.S. Data 2015, International Data 2011)[8]	Agriculture 0% Services 64%, Manufacturing 5%, Trade 10%, Government 21%	Agriculture 0% Services 70%, Manufacturing 10%, Trade 9%, Government 11%	Agriculture 0% Services 63%, Manufacturing 11%, Trade 14%, Government 12%	Agriculture 0% Services 48%, Manufacturing 8%, Trade 14%, Government 11%	Agriculture 1%, Services 63%, Manufacturing 12%, Trade 12% Government 12%,	Services 46%, Industry 44%, Agriculture 10%	Services 71%, Industry 29%, Agriculture 0%	Services 72%, Industry 25%, Agriculture 3%	Services 70%, Industry 28%, Agriculture 2%
GDP Per Capita (U.S. Data 2015, in 2009 dollars adjusted for inflation over time. International Data 2010)[9]	$54,388	$62,918	$49,225	$56,721	$49,844	$11,361	$37,293	$35,918	$46,304 (2010)
GDP Per Capita (in comparable USD$ using PPP) for 2013[10]	No data	No data	No data	No data	$47,495	$14,088	$32,818	$33,404	$57,417
Unemployment Rate (2015)[11]	5.2%	5.0%	3.4%	5.6%	5.3%	4.1%	1.9%	8.1%	7.5%
Youth Unemployment Rate (2015)[12]	16.9%	12.2%	13.4%	18.2%	16.2%	9.7%	10.2%	17.7%	12.9% (2013)
Competitiveness Data									
World Economic Forum Global Competitiveness Rank (2014)[13]	No Data	No Data	No Data	No Data	3rd	28th (China)	2nd	4th	15th (Canada)
Innovation and Entrepreneurship State Ranking (2015)[14]	3rd	5th	18th	14th	No Data	No Data	No Data	No Data	No Data

	Maryland	Massachusetts	New Hampshire	New Jersey	U.S.	Shanghai	Singapore	Finland	Ontario
Student Population Data									
Public School Enrollment (2015)[15]	879,601	943,700	180,500	1,362,000	49,522,000	1,837,800 (2012)	522,000	542,100	2,000,000
Number of Schools (2014)[16]	1,442	1,865	482	2,508	98,271	2,964 (2012)	365	3,347 (2005)	4,897
Average Class Size, Lower Secondary (2011-12)[17]	Not available as reporting standards not met	25	24	25	26	35	35.5	17.8	25
Percent of Children Ages 0-17 Living In Households With Equivalent Incomes Below 50% of National Median (International) And % of Children Eligible For Free and Reduced Lunch (U.S. States) 2011-12[18]	46% (2015)	35.1% FRL	26.3% FRL	35.5% FRL	49.6% FRL or 23% using 50% median income measure	29%* (China)	26%	3%	14%
Percent of Students Who Are Non-Native Speakers (U.S. Data 2014)/Intl Data (2011-12)[19]	2.5%	7.9%	2%	4%	9.1%	20% Migrant Students	16.6% Non-Official Language Speakers	5% Foreign-Born Students	27% Foreign-Born Students
Education Spending Data									
Percent of GDP Spent on Primary, Secondary, and Non-tertiary Education (U.S. Data 2010/Intl Data 2010)[20]	4.0%	3.7%	4.2%	5.0%	7.3%	3.5%	2.8%	4.1%	4.1%
Annual Per Pupil Primary and Secondary Expenditures (U.S. Data 2013/Intl Data 2011)[21]	$13,829	$14,515	$13,721	$17,572	$10,700	$3,602	$7,862	$9,180	$10,273
Annual Per Pupil Primary and Secondary Expenditures Adjusted for Regional Cost Differences (2013)	$12,679	$13,546	$14,718	$15,742	$11,841	No Data	No Data	No Data	No Data
Student Outcomes Data									
Percentage of Students Who Complete Secondary School (2014)[22]	86%	86%	88%	89%	82%	79.2%	98%	93%	83.1%
Percentage of Adults Ages 25-64 with a Tertiary Degree/Diploma (2014)[23]	49.9%	55.4%	49.2%	50.1%	45.3%	13.7%	25.8% (2008)	40%	53%
Programme for the International Assessment of Adult Competencies (PIAAC) 2013, Literacy Rank out of 23 Countries[24]	No data	No data	No data	No data	16	No data	No data	2	11
Programme for the International Assessment of Adult Competencies (PIAAC) 2013, Numeracy Rank out of 23 Countries[25]	No data	No data	No data	No data	23	No data	No data	1	17
Programme for the International Assessment of Adult Competencies (PIAAC) 2013, Problem Solving Rank out of 23 Countries[26]	No data	No data	No data	No data	19	No data	No data	1	15
Change in Percent of 25-64 Year-Olds with a Tertiary Degree from 2008 to 2014[27]	+6.0%	+5.8%	+3.2%	+5.5%	+7.4%	+7.1%	+14.9%	+5%	+3.3%

KEY INDICATORS WITH SUBQUESTIONS

1. Provide strong supports for children and their families before students arrive at school

Context: Overview of day care and preschool systems

What proportion of children have access to high quality childcare options?
- What percent of young children use childcare?
- Is childcare considered affordable?
- What public funding is provided for low-income families to obtain childcare?
- What is the quality of the childcare professionals (pay, qualifications, turnover)?

What proportion of children have access to high quality early childhood education?
- What percentage of children are enrolled in preschool?
- What is the preschool enrollment rate for low income students?
- How is preschool funded: is preschool universally funded or income-based?
- What percentage of preschool students attend full-day programs?
- What are the qualifications for preschool teachers?
- What systems are in place to ensure preschool quality?
- What proportion of young children are ready for kindergarten or the first year of compulsory education?

2. Provide more resources for at-risk* students than for others

Context: Overview of how resources are allocated to at-risk students

Do at-risk students receive more or less resources than other students, and if so how much?
- Do at risk students receive more funding?
- Do at risk students have access to high quality teachers?
- Are student-teacher ratios lower for at-risk students than for other students?

*For example, low income, ELL, and students with disabilities. But definitions vary by jurisdiction and information will be provided about what resources are available from all public sources—national, state, and local.

3. Develop world-class, highly coherent instructional systems

Context: Overview of instructional systems, including standards, assessment and curricula

To what extent are standards internationally benchmarked in the core subjects* and in the competencies demanded of a 21st century workforce?
- Are standards internationally benchmarked?
- Are standards set for a full range of core subjects?
- Are standards set for 21st century skills?
- Are national and state standards aligned?

*(Native language, mathematics, sciences, history, the arts)

To what extent are curriculum frameworks, syllabi and curriculum provided to guide teachers?

- Are aligned curriculum frameworks, syllabi and curriculum provided to teachers?
- How systematically are teachers trained to use those materials?

Are high quality assessments that measure the knowledge and skills students need to succeed in the 21st century being used?

- Do assessments include a combination of summative and formative assessments?
- Are the assessments used to provide incentives? Are there consequences for students, teachers and/or schools?
- Do the assessments have multiple formats which measure critical thinking skills, including essays and multi-step problems?
- Are past exam questions and samples of answers to those questions released so that teachers, students and parents are clear about the expectations?

To what extend is the instructional system aligned?

- Are standards, curriculum/frameworks and assessments aligned?
- Are exit standards for secondary school aligned to entrance requirements for tertiary/ post-secondary?

4. Create clear gateways for students through the system, set to global standards, with no dead ends

Context: Overview of pathways through the education systems, including gateways and qualifications

Are there clear gateways for students through the primary, secondary and post-secondary systems with no dead-ends?

- Are there clear college and career readiness standards and gateway exams set to those standards?
- Does the system define courses and grades in those courses or cut scores on examinations necessary to move from one program of study or pathway to the next?
- To what extent is support available to students who do not meet those qualifications?
- Do all secondary school options include a path to post-secondary education?
- To what extent are students prepared to enter college or career training without remediation?
- Is there a regular, timely and relevant guidance system that helps students develop their future plans? What is the ratio of guidance counselors to students?

5. Assure an abundant supply of highly qualified teachers with the necessary dispositions, knowledge and skills

Context: Overview of the systems' efforts to recruit and train high quality teachers

Are systems in place to manage the supply of teachers in relation to the demand for them?
- Does the state produce the appropriate supply of teachers annually? That is, how many are needed and how many graduate statewide in each area of specialization?

How qualified are the candidates admitted to teacher preparation programs?
- From what quartile of college-bound high school graduates are teacher education students drawn?
- What are requirements for entry to the teacher preparation program?
- Are requirements for entry competitive? (E.g., how many people apply? What percent get in? How do admissions rates for teacher preparation compare to preparation programs for high-status professions?)

How rigorous is the program of instruction for teacher preparation?
- What is required for completion? (How many years and what kind of courses? Is there a clinical experience and if so, how long?)
- To what extent is teacher education being conducted in research universities?
- To what extent are teacher being provided with research skills & being taught diagnosis and prescription?
- To what extent are teachers required to have mastery of the subject(s) they will teach?
- What percentage of teachers are teaching without being traditionally prepared?

6. Redesign schools to be places in which teachers, as professionals, work collaboratively with opportunities, incentives and support to continuously improve their professional practice and the performance of their students

Context: Overview of school organization and professional learning to support high quality teaching and teachers

How competitive are teachers' salaries with the compensation in the high status professions?
- What is teachers' starting salary? Is it competitive relative to high-status professions?
- What is a teachers' average salary? Is it competitive relative to high-status professions?
- Is there a career ladder for educators?
- How is the career ladder for teachers organized?
- What are the criteria for moving along these ladders?
- Is there a formal method for identifying first-rate teachers and for assigning them to

mentor new and junior teachers for a significant period of time?

Does the way the school is organized promote teacher growth and improvements in student learning?
- Are there strong incentives for teachers to continuously improve their performance?
- Are there formal structures that provide the time and incentives for teachers to learn from other teachers?
- Is there substantial time available for teachers to work together in teams to improve instruction?
- Are there resources available to teachers to gain the knowledge they need to build their expertise and improve their practice?

7. Create an effective system of career and technical education and training

Context: Overview of Career and Technical Education systems

Is there a Career and Technical Education (CTE) system that supports 21st century careers?
- To what extent is training available to students in a wide range of high-skill, high-demand and well-paying careers?
- To what extent does training occur in authentic work environments which include up-to-date equipment, academic integration and work-based learning?
- Are there enough apprenticeship slots for all CTE students who want them?
- To what extent are instructors provided the opportunity to become familiar with state-of-the-art practices?
- To what extent is information available to students, parents and counselors that will help students make informed career choices?

Do CTE programs lead to industry-recognized qualifications?
- Do all programs lead to qualifications that are widely recognized by industry?
- Are qualifications continuously adjusted to the needs of economic sectors at the state, national, and global levels?

Is the CTE system attractive to a broad range of students and parents?
- What proportion of students choose to pursue a CTE program of study?
- What percent complete those programs at the secondary level?
- What percent go on to post-secondary education or training or work?

8. Create a leadership development system that develops leaders at all levels to manage such systems effectively

Context: Overview of systems of developing high quality school leaders, including recruitment, training, and support

Does the system prepare school leaders effectively?
- How are principals recuited and selected?
- What form does principal training take?
- Are principals prepared to manage professionals effectively?
- Does the system develop school leaders continuously throughout their careers?

Does a career ladder for school leaders exist that provides incentives for increasing roles and responsibilities?
- If so, what does it look like? Does it extend to district and state level? Who establishes it? Is it aligned with goals for improvement?

9. Institute a governance system that has the authority and legitimacy to develop coherent, powerful policies and is capable of implementing them at scale

Context: Overview of education governance systems

Are there shared goals across the system?
- Are goals known to all partners in the system?

Is there a place where the buck stops?
- Responsible for pre-school, K12, teacher education, higher education and vocational education?
- Is it clear what the roles of various partners are?
- Are there clear lines of authority to make and implement policies?
- Is system progress tracked, publicized and easily located?

Is there an effective way to hold the other parts of the system accountable and to provide effective help to non-performing parts of the system?
- Does the system have an effective way of identifying non-performing teachers, principals, schools, districts and schools of education?
- Does the system have a way to help less successful teachers and principals?
- Does the system have a way to help less successful schools and districts?

References

1. **International Jurisdictions**: World Bank, 2013, http://data.worldbank.org/indicator/SP.POP.TOTL
   U.S. States: U.S. Bureau of the Census, 2010, http://www.factmonster.com/ipka/A0004986.html

2. **International Jurisdictions**: CIA World Factbook, 2015, https://www.cia.gov/library/publications/resources/the-world-factbook/
   U.S. States: U.S. Bureau of the Census, Statistical Abstract of the U.S. 2012, Table 19, http://www.indexmundi.com/facts/united-states/quick-facts/all-states/asian-population-percentage#map

3. **Canada**: Statistics Canada, http://www.statcan.gc.ca/tables-tableaux/sum-som/l01/cst01/demo62g-eng.htm. **Other International Jurisdictions**: World Population Review, http://www.worldpopulationreview.com
   U.S. States: U.S. Bureau of the Census, 2010 Census of Population, http://www.census.gov/geo/www/ua/2010urbanruralclass.html

4. **China**: "On the Relevance of Relative Poverty for Developing Countries" Working Paper No. 314 by Christopher Garroway and Juan R. de Laiglesia, OECD, September 2012. http://www.oecd.org/dev/americas/WP314%20AE.pdf
   Ontario: Statistics Canada's Low-Income Measure ; "Ontario Poverty Progress Profile". www.cwp-csp.ca. Canada Without Poverty. 2012.
   Singapore: The Heart Truths, "26% of Signaporeans Live Below Poverty Line in Singapore", http://thehearttruths.com/2013/10/25/26-of-singaporeans-live-below-poverty-line-in-singapore/
   US and Finland: OECD Society at a Glance 2014 Highlights, http://www.oecd.org/els/societyataglance.htm

5. **U.S. States**: Poverty: 2000 to 2012 American Community Survey Briefs by Alemayehu Bishaw, US Department of Commerce, US Census Bureau, September 2013. https://www.census.gov/prod/2013pubs/acsbr12-01.pdf

6. **International Jurisdictions**: CIA World Factbook, https://www.cia.gov/library/publications/the-world-factbook/geos/xx.html
   U.S. States: U.S. Department of Commerce, Bureau of Economic Analysis, http://www.bea.gov/newsreleases/regional/gdp_state/gsp_newsrelease.htm

7. **International Jurisdictions**: CIA World Factbook, https://www.cia.gov/library/publications/the-world-factbook/geos/xx.html
   U.S. States: US Census Bureau, Statistical Abstract of the United States 2012, Table 672 GDP By Selected Industries and State: 2009

8. **U.S and International Jurisdictions:** converted to PPP using the World Bank's PPP conversion factor, GDP retrieved from: http://data.worldbank.org/indicator/PA.NUS.PPP

9. **International Jurisdictions**: OECD 2010, *Strong Performers and Successful Reformers*
   U.S. States: U.S. Dept of Commerce, Bureau of Economic Analysis

10. **International Jurisdictions:** converted to PPP using the World Bank's GDP Per Capita, PPP (current international $) retrieved from: http://data.worldbank.org/indicator/NY.GDP.PCAP.PP.CD

11. **International Jurisdictions**: CIA World Factbook, https://www.cia.gov/library/publications/the-world-factbook/geos/xx.html
    U.S. States: U.S. Dept of Labor, Bureau of Labor Statistics,"Labor Force Statistics from the Current Population Survey," http://data.bls.gov/pdq/SurveyOutputServlet

12. **International Jurisdictions**: CIA World Factbook, https://www.cia.gov/library/publications/the-world-factbook/geos/xx.html
    U.S. States: U.S. Dept of Labor, Bureau of Labor Statistics,"Labor Force Statistics from the Current Population Survey," http://data.bls.gov/pdq/SurveyOutputServlet

13. World Economic Forum, http://www.weforum.org/reports/global-competitiveness-report-2014-2015

14. U.S. Chamber's Enterprising States Dashboard, http://archive.freeenterprise.com

15. **Singapore and Shanghai:** OECD 2010, *Strong Performers and Successful Reformers,*
    Onatrio: OECD 2010, "Reform to Support High Achievement in a Diverse Context for Ontario" http://www.oecd.org/pisa/pisaproducts/46580959.pdf;
    Finland: Statistics Finland, http://www.stat.fi/til/opiskt/2012/opiskt_2012_2014-01-29_tie_001_en.html;
    U.S. States: NCES Digest of Education Statistics, Table 203.20: Enrollment in public elementary and secondary schools, by region, state, and jurisdiction: Selected years, fall 1990 through fall 2023, http://nces.ed.gov/programs/digest/d13/tables/dt13_203.20.asp

16. **Singapore:** OECD 2010, *Strong Performers and Successful Reformers*
    Finland: OECD, "Improving School Leadership in Finland," http://www.oecd.org/finland/38529249.pdf
    Shanghai: NCEE, "Aligned Instructional Systems," Paper by Tina Isaacs (unpublished)

Ontario: Ontario Ministry of Education, http://www.edu.gov.on.ca/eng/educationFacts.html#note1
U.S. States: NCES Selected Statistics from the Public Elementary and Secondary Universe: School Year 2012-13, Table 2, http://nces.ed.gov/pubs2014/2014098.pdf

17. **Finland and Singapore:** OECD Teaching and Learning International Survey, 2013, http://www.oecd.org/edu/school/talis.htm
Ontario: average class size mandated by the state, http://www.edu.gov.on.ca/eng/educationFacts.html#note1
Shanghai: http://www.telegraph.co.uk/education/educationnews/10490480/How-pushy-parents-helped-make-Shanghais-children-the-cleverest-in-the-world.html
U.S. States: NCES, Schools and Staffing Survey. Table 7. Average Class Size in Public Primary Schools, Middle Schools, High Schools, and Schools with Combined Grades, by classroom type and state: 2011-12, http://nces.ed.gov/surveys/sass/tables/sass1112_2013314_t1s_007.asp

18. **China:** (2002) World Family Map 2014: "Mapping Family Change and Child Well-Being Outcomes." http://worldfamilymap.org/2014/e-ppendix/figure7
Other International Jurisdictions: Washington Post Map: How 35 Countries Compare on Child Poverty (the US is ranked 34th) by Max Fisher, April 15, 2013. http://www.washingtonpost.com/blogs/worldviews/wp/2013/04/15/map-how-35-countries-compare-on-child-poverty-the-u-s-is-ranked-34th/
U.S. States: NCES Digest of Education Statistics 2013 Table 204.10 Number and Percentage of Public School Students Eligible for Free or Reduced-Price Lunch, by State: SelectedYears, 2000-01 through 2011-12. Retrieved from: http://nces.ed.gov/programs/digest/d13/tables/dt13_204.10.asp

19. **Shanghai:** 2010, OECD *Strong Performers and Successful Reformers*, p95
Singapore: Per SingStat's data table on languages: In Singapore, 83.4 percent of children aged 5 and over lived in homes where one of the official languages (English, Mandarin, Malay, Tamil) was "mostly frequently spoken" (2010). 14.3 percent of children aged 5 and over lived in homes where Chinese dialects other than Mandarin were most frequently spoken; 2.3 percent lived in homes where other languages were most frequently spoken. See: http://www.singstat.gov.sg/docs/default-source/default-document-library/publications/publications_and_papers/cop2010/census_2010_release1/cop2010sr1.pdf
U.S. States: NCES, Digest of Education Statistics, Table 204.20. Number and percentage of public school students participating in programs for English language learners, by state: Selected years, 2002-03 through 2011-12, http://nces.ed.gov/programs/digest/d13/tables/dt13_204.20.asp

20. **Ontario:** 2010, Statistics Canada, Education Indicators in Canada: An International Perspective, Chart B.2.a. Public and Private Expenditure on Educational Institutions as a Percentage of GDP, by Level of Education, 2010. http://www.statcan.gc.ca/pub/81-604-x/2014001/c-g/desc/descb.2.1-eng.htm
Finland and Singapore: 2010, World Bank, Public Spending on Educaiton, total (% of GDP). http://data.worldbank.org/indicator/SE.XPD.TOTL.GD.ZS/
Shanghai: 2012, Data on education budget taken from Shanghai Press Release: "Shanghai's 12th Five-Year Plan for Educational Reform and Development" April 1, 2012. 70b yuan spending figure converted to US $ in comparison to $321 b GDP in 2012.
U.S. States: National Center for Education Statistics, Revenues and Expenditres for Public Elementary and Secondary Education. Cited by Annie E. Casey Foundation's Kids Count Data Center. Retrieved from: http://datacenter.kidscount.org/data/tables/5199-per-pupil-educational-expenditures-adjusted-for-regional-cost-differences?loc=1#detailed/2/2-52/false/868,867,133,38,35/any/11678

21. **U.S. States:** 2012, US Census Bureau, Public Education Finances: 2012. Issued May 2014. http://www2.census.gov/govs/school/12f33pub.pdf. Adjusted for cost of living.
Finland: 2011, OECD (2014), "Indicator B1: How much is spent per student?", in Education at a Glance 2014: OECD Indicators, OECD Publishing. Retrieved from: http://www.oecd.org/edu/EAG2014-Indicator%20B1%20(eng).pdf"
Canada: 2011, Statistics Canada Education Indicators in Canada: An International Perspective. Table B.1.1.1. Annual Expenditure by Educational Institutions, per Student for all Services, by Educational Level, Canadian dollars, Canada, provinces and territories, 2010/2011. http://www.statcan.gc.ca/pub/81-604-x/2014001/t/tblb.1.1.1-eng.htm. Average of primary/secondary expenditure coverted fron Canadian dollars to USD.
Shanghai: 2013, Ministry of Education of the People's Republic of China. Statistical Bulletin of Education Funding 2013. http://www.moe.edu.cn/publicfiles/business/htmlfiles/moe/s3040/201411/178035.html. Average of primary and lower secondary is 22,482 RMB. Converted to USD.
Singapore: 2011, Government Funding for Operating Expenses Per Student cited in Head K Ministry of Education Singapore Budget 2014. http://www.singaporebudget.gov.sg/data/budget_2014/download/27%20MOE%202014.pdf. Average of primary and secondary.

22. **U.S. States:** 2013, NCES Common Core of Data. Public High School 4-Year Adjusted Cohort Graduation Rate for the US, the 50 States, and the District of Columbia: School Years 2010-11 to 2012-13. http://nces.ed.gov/ccd/tables/ACGR_2010-11_to_2012-13.asp
Shanghai: 2009, *Surpassing Shangahi: An Agenda for American Education Built on the World's Leading Systems*. Ed. Marc Tucker. Harvard Education Press, 2011, p27. Enrollment rate (both general and vocational) for senior secondary school.
Singapore: CIEB's Singapore Instructional Systems overview, http://www.ncee.org/programs-affiliates/center-on-international-education-benchmarking/top-performing-countries/singapore-overview/singapore-instructional-systems
Finland: 2010, OECD, Finland: A Non-Competitive Edcuation for a Competitive Economy. 2012. http://pasisahlberg.com/wp-content/uploads/2013/01/OECD-Finland-Lessons-for-Japan-2012.pdf
Ontario: 2013, Ontario Ministry of Education News Release: High School Graduation Rate Stays Strong: Ontario Seeing Steady

Increase in Four-Year Rate. April 4, 2014. http://news.ontario.ca/edu/en/2014/04/high-school-graduation-rate-stays-strong.html

23. **U.S. States:** US 2012 Census, American Communty Survey. Source: Lumina Foundation report, A Stronger Nation Through Higher Education: Closing the Gaps in College Attainment. Retrieved from: http://strongernation.luminafoundation.org/report/
Shanghai: 2012data: Chart from Jackie "Educational Attainment of Employed Persons by Age and Sex." Main data from 2012 Labor Force Survey. Based on employed population.
Singapore: 2008 data from World Bank. Retrieved from: http://www.tradingeconomics.com/singapore/labor-force-with-tertiary-education-percent-of-total-wb-data.html. Labor force with tertiary education.
Finland: 2012 data:OECD (2014), Education at a Glance 2014, Chart A1.1, available at http://dx.doi.org/10.1787/888933114951

24. OECD Programme for the International Assessment of Adult Competencies (PIAAC) http://www.oecd.org/site/piaac/#d.en.221854

25. OECD Programme for the International Assessment of Adult Competencies (PIAAC) http://www.oecd.org/site/piaac/#d.en.221854

26. OECD Programme for the International Assessment of Adult Competencies (PIAAC) http://www.oecd.org/site/piaac/#d.en.221854

27. **U.S. States:** NCHEMS Information Cente for Higher Education Policymaking, data from Census American Community Survey 2005 and 2012, "5-64 year old with an AA or higher (2005/2012)" http://www.higheredinfo.org/dbrowser/index.php?measure=93
Finland and U.S.: OECD Education at a Glance 2014, http://www.oecd.org/edu/eag.htm
Ontario: Data is for 2006-2011, http://www.fin.gov.on.ca/en/economy/demographics/census/cenhi06-10.pdf
Shanghai: Labor Force Survey 2006-2012, data is for employed persons only
Singapore: Singapore Stats 2014, data is for years 2004-2014, www.singstat.gov.sg/statistics/visualising-data/charts/educational-attainment

Maryland Commission on Innovation and Excellence in Education
2017 Schedule and Work Plan
Draft 1/9/17 Subject to Change

All meetings will be held from 10am - 4pm in Room 120 House Office Building, Annapolis unless noted. Meeting topics will include policy discussions and related funding/finance policies. Time will be reserved at the end of each meeting for public comment on the topics being discussed at each meeting.

Meeting Topics:	Meeting Date:
High Quality Teachers	January 9, 2017
High Quality Teachers (Continued) and School Leadership Development	late April/early May 2017
Early Childhood Education and Career and Technical Training	late May 2017
World Class Learning Systems with No Dead Ends	mid-late June 2017
Resource Equity	mid-late July 2017
Governance/Accountability/Innovative Strategies and Work Session – Draft Recommendations on Making Maryland a Top Performing System in the World	late August 2017
Work Session – Base and Weights, accountability, etc.	mid September 2017
Work Session – Enrollment counts, Prek expansion, local wealth, etc.	mid October 2017
Work Session – GCEI/CWI, CTE, distribution of funding, etc.	mid November 2017
Work Session – Draft recommendations on Funding, etc.	early December 2017
Work Session – Final recommendations on Making Maryland a Top Performing System in the World and Funding	mid December 2017

Memorandum

TO: Chairperson Kirwan and Commission members

FROM: Mark Fermanich, Bob Palaich and Justin Silverstein, Augenblick, Palaich and Associates

DATE: January 6, 2017

SUBJECT: Responses to Questions Posed at December 8, 2016 Meeting Regarding Variation in Recommended Base Costs and At Risk Weights by School Level; Transportation Funding; and School Size, Configurations and Student Achievement

---

This memo is delivered in response to a number of the questions posed by the Commission following the study team's presentation on December 8, 2016 including:

1. What is the variation in the recommended base cost by school level?
2. What is the variation in at risk weights by school level?
3. What are states the Commission could examine that have strong transportation formulas?
4. Were there any recommendations for school size based on grade configurations?

Additionally, the Commission asked for a full list of the 111 successful schools, which is provided at the end of this memo in table format.

What is the Variation in Base Cost and At Risk Weights by School Level

This section addresses the first two questions regarding the variance in the recommended base cost and at risk weights by school level (elementary, middle and high school).

Base Cost[1]

In the *Final Report of the Study of Adequacy of Funding for Education in Maryland,* the study team recommended a base cost, prior to adjusting for federal funds, of $10,970. This figure was derived

---

[1] [1] This summary is based on the analysis reported in the final adequacy report and is cited as follows: Augenblick, Palaich & Associates. (2016). *Final Report of the Study of Adequacy of Funding for Education in Maryland*. Denver, CO: APA Consulting.

using the blended adequacy model that reconciled the results of the evidence-based (EB) and professional judgment (PJ) approaches. The base cost figure is intended to represent the resources a student with no special needs in a district with no special circumstances needs to meet state standards and includes the following key resources:

- Small class sizes (15:1 grades K-3, 25:1 grades 4-12);
- Staffing to support (but not limited to) the following areas: art, music, PE, world languages, technology, CTE, and advanced courses;
- Significant time for teacher planning, collaboration, and imbedded professional development;
- Additional instructional staff including instructional coaches and librarian/media specialists;
- High level of student support, such as counselors, nurses, behavior specialists, or social workers, for all students;
- Administrative staff to allow for instructional leadership, data-based decision making, and evaluation;
- Technology rich learning environments, resourced at a level that would allow for one-to-one student devices;
- Resources for instructional supplies and materials, assessment, textbooks, and student activities; and
- District-level personnel and other resources to support schools.

Please refer to *Final Report of the Study of Adequacy of Funding for Education in Maryland* Chapter II (pages 14-17) and Chapter III (pages 39-57) for a detailed description of the resources identified from the EB and PJ approaches, respectively, as well as Chapter V (pages 73-77) that discusses the key resource areas that were modified to blend the two approaches to create the final recommended base figure.

As noted, a single base figure was recommended. It was derived by combining the resources at the three school levels proportionally based on the number of students in each grade and then adding that per pupil amount to the per pupil district costs. Table 1 presents the calculated base cost for each school level based on adding each school level's per pupil resources to the per pupil district level costs separately.

Table 1
Base Cost by School Level

	Elementary	Middle	High School	Combined
Base	$11,822	$10,401	$10,128	$10,970

Source: APA

As shown, there was variation in the base amount by school level, with the identified cost at the elementary level more than $1,000 per student higher than at the middle and high school levels, where the costs were similar. The higher base at the elementary level is due to the smaller class sizes identified for kindergarten through third grade (15:1) compared to the 25:1 class size

identified for grades four and above as noted above. Pupil supports and administration were similar across the three levels.

At Risk Weights

Prior to adjustments for federal funds, the study team recommended a .40 weight for at risk students. This weight was based on a review of the results from the EB and PJ approaches with the recommended figure coming most directly from the PJ work. As such, the weights by school level shown in Table 2 are based on the resources identified through the PJ approach in relation to the blended base cost; at risk weights are presented for three concentration levels (25, 50, and 75 percent) as well as the average weight at each school level.

Table 2
At Risk Weights by School Level

	Elementary	Middle	High School	Combined
At Risk Weights				
25% Concentration	0.47	0.22	0.20	0.34
50% Concentration	0.57	0.40	0.28	0.45
75% Concentration	0.37	0.38	0.27	0.35
Average	***0.47***	***0.34***	***0.25***	***0.39***

Source: APA

As was seen for the base cost, weights for at risk varied by school level, with the highest weights generated at the elementary school level and the lowest weights at the high school level. This is based upon the more intensive interventions identified in elementary schools (such as before/after school and summer school programs for 100 percent of elementary at risk students and more interventionist support during the day) that are intended to reduce the amount of intervention that would be needed in later grades.

For more specific detail on the resources that led to the at risk weights by school level above, in the *Final Report of the Study of Adequacy of Funding for Education in Maryland* please refer to: Table 3.8a (pages 43-44) for specific at risk personnel by school level; Table 3.9 (page 47) for school-level non-personnel costs; and Table 3.10a-c (pages 49-50) for additional programs.

Student Transportation Funding in Maryland and Other States

This section examines the various approaches states use to fund transportation and identifies three state transportation formulas the Commission may want further examine. It begins with a brief summary of Maryland's current transportation formula and then provides information on other states.

Transportation in Maryland Today[2]

Maryland's Transportation Subsidy Formula is comprised of a Transportation Base Grant for non-disabled riders and an additional amount for disabled riders (currently set at $1,000 per disabled rider). Each district's Transportation Base Grant consists of its Transportation Base Grant for the prior year adjusted both by the transportation component of the Consumer Price Index for the Baltimore-Washington metropolitan area and by a factor for enrollment increases of $277.55 (for fiscal year 2014-15) for each additional student over the prior fiscal year's enrollment. Districts are guaranteed a minimum annual increase of 1.0 percent in their Base Grant. The formula does not, however, decrease funding in response to enrollment decreases. Until 1982, a committee of the State Board of Education established the per district funding amount. The current formula was adopted by the Legislature in 1982. In 2002, the formula was further adjusted to increase the base student transportation grant for the 15 districts that experienced enrollment increases between 1980 and 1995 – a time during which the formula did not adjust funding in response to enrollment increases.

Transportation expenditures amounted to 5.3 percent of total public school spending in 2012-13. Overall transportation costs are determined by the number of students transported, driver compensation, maintenance costs, vehicle fuel costs, and other operating costs. The population density of a district influences costs because areas with lower population densities tend to require buses to drive more miles than areas with higher population densities. Even with longer miles driven, the need to maintain reasonable ride times may not allow the seating capacity to be fully used. In urbanized areas, traffic congestion may also require longer drive times at higher labor rates. More strategic travel routes and better utilization of available seats can influence bus route efficiency.

Statewide, the total number of non-disabled students being transported declined slightly between 2005-06 and 2014-15. However, significant changes in the number of non-disabled students transported have occurred for specific districts. Some of these changes have resulted from district policy and practice changes that have made more students eligible for transportation services. Shifts in district total enrollment have also driven some of the transportation figures. Statewide, there was a 2.7 percent decrease in the number of regular students transported. However, two districts experienced much larger changes in the number of non-disabled students transported. Calvert County experienced a 25.7 percent decrease (a reduction of 4,430 students), while Talbot County saw a 58.8 percent increase (a gain of 1,599 students). Other districts that saw large decreases in numbers, but not percentages, included Baltimore City (1,372), Carroll County (2,380), Frederick County (5,046), Harford County (3,292), and Prince George's County (7,115).

Transportation of disabled students is often very expensive. Disabled students tend to be placed in highly specialized programs in distant locations. These students may require wheelchair-accessible vehicles or other specialized vehicles. The passenger capacity of such vehicles is typically low. Over the

---

[2] This summary is based on the analysis reported in the final report on increasing and declining enrollment in Maryland Public Schools prepared for the Maryland Adequacy Study contract and is cited as follows. Hartman, W. & Schoch, R. (2015). *Final Report of the Study of Increasing and Declining Enrollment in Maryland Public School*s. Denver, CO: APA Consulting.

last 10 years, most districts have experienced both a decrease in special education enrollment and an increase in numbers of disabled students transported. For example, in Talbot County, special education enrollment decreased by more than 10 percent, while the number of disabled students transported increased by 100 percent.

Transportation costs for the total number of combined non-disabled and disabled students transported increased by 41 percent between 2005-06 and 2012-13. The average cost per pupil transported in 2005-06 was $751 compared to $1,058 in 2012-13 (transportation costs were not available broken out by each category). Prince George's County had the highest per pupil transportation costs in both five-year periods ($1,589). Cecil County had the lowest cost in both five-year periods ($564).

In the past decade, a number of Maryland districts have expanded transportation services. The number of students eligible for transportation has increased along with the levels of transportation services offered. According to interviews with transportation managers, service level expansion could include more frequent bus stops, more stops located at homes, and more air conditioned vehicles. All of these factors affect transportation costs.

The study team's Increasing and Declining Enrollment study presented an analysis of the Transportation Base Grant in relation to a number of factors that affect transportation costs. These factors included route miles traveled, vehicles utilized, and population densities. Based on an analysis of all of the factors that impact transportation costs and revenues, no single factor appeared to strongly influence the Transportation Base Grant amounts provided to districts. Because a large number of factors affect transportation cost, many states use a more complex transportation formula in an attempt to account for a variety of cost factors when calculating transportation funding. Under Maryland's current transportation funding formula, the highest-funded county received approximately double the amount of the lowest-funded county. Table 3, below, summarizes the wide variations across districts in the amounts provided by the transportation funding formula factors examined for this analysis.

Table 3
Summary of Transportation Base Grant Amounts by Factor

Transportation Funding Formula Measure	State Average	Low	High
Per Non-Disabled Student Transported in 2013-	$396	$325	$785
Per Route Vehicle in 2013-14	$32,034	$25,635	$54,462
Per Route Mile in 2013-14	$2.88	$1.96	$49.07
Transportation Grant as a Percentage of Total Transportation Expenditures 2005-06	43%	34%	67%
Transportation Grant as a Percentage of Total Transportation Expenditures 2012-13	42%	33%	70%

Source: MSDE

Transportation Funding in Other States

Several states have recently studied and revised their transportation funding formulas to address historical inequities and promote cost effective transportation services. Studies done in the states of Washington and Montana[3] have identified as many as six approaches to transportation funding across the country:

1. Provide funding to support all K-12 educational programs, but no funds explicitly for pupil transportation.
2. Allocate block grant funding for transportation separate from the basic education funding. These funds can be distributed based on total enrollment or students transported.
3. Allocate state funds based on approved costs, identifying each specific type of expenditure that will be reimbursed. States may reimburse all or a percentage of approved costs.
4. Provide per unit funding for specified and measurable units. The units used vary from the total miles driven, the number of students transported, the number of trips per day, and other measurable units related to costs.
5. Allocate funds based on expected costs. A set of factors defining demographic and geographic differences as well as transportation activities is analyzed with a multivariate statistical methodology that computes the expected costs for each district. The state then funds a district's expected, rather than actual, costs. These formulas are intended to promote certain transportation service levels and efficiencies.
6. Provide funding levels based on efficiency and best practice. This approach provides adjustments for factors beyond the control of local school districts.

Typically, transportation funding formulas aim to provide transportation funding that: (1) is closely related to factors influencing transportation costs; (2) is understandable; (3) rewards efficiency or penalizes inefficiency; (4) promotes student safety; and (5) accommodates special circumstances. The most sophisticated formulas incorporate statistical analyses of the factors influencing transportation costs into their financial models. In this way, these formulas determine the appropriate state and local shares of transportation funding. Using formulas effectively requires accurate data, usually transportation operations information from the prior school year.

The study team feels that Florida, North Carolina and Pennsylvania have transportation systems that have strong data systems, that offer help to districts in route planning, and that have formulas that address the principles listed above. It would be recommended that the Commission further examine these states formulas as they look into transportation funding.

---

[3] Management Partnership Services, Inc., *Development of Student Transportation Funding Methodology Options for Washington State,* State of Washington Office of Financial Management, November, 2008. The Montana review was conducted by the Montana Legislative Council in the early 1990s.

School Size, Configuration and Student Achievement

The commission asked for information on impact of school size by grade configuration. The study team provided three school size reports during the course of the study. This section provides an overview of the results of the school size work, which provide insights into the school size question.

Summary[4]

This section provides an overview of the effects of school size and configuration on student achievement. The findings summarized here were originally presented in the final report of the study team's school size study. While there is a significant body of research on the effects of school size, the literature is not conclusive. However, two consistent themes may be drawn from the literature. First, smaller school sizes do not directly impact student achievement but instead enable other conditions that do, such as a positive school climate, supportive relationships between staff and students, and greater student engagement in academics and extracurricular activities. Successful smaller schools also benefited when accompanied by strong school leadership and a high-quality instructional program. Second, smaller schools particularly benefit students who are at risk of underperforming or failing in school, such as students in poverty, English language learners, and students receiving special education services.

Given the potentially beneficial impacts of smaller learning communities on student learning, especially for at risk students, a number of organizations invested in smaller learning communities and smaller schools as strategies in the 2000s to boost student achievement. These organizations, including the U.S. Department of Education, the Bill and Melinda Gates Foundation, and the Carnegie Corporation, were guided by the hypothesis that smaller schools lead to better academic outcomes. Several comprehensive reform models for creating smaller schools or smaller learning environments emerged from these efforts. These include:

- School within a school/school within a building;
- Smaller learning communities;
- Career academies;
- Autonomous small schools;
- Alternative schools; and
- Magnet schools or theme-based schools.

Each of these models is described later in this section.

An examination of the relationship between school size, the concentration of poverty in schools (i.e. the percent of students eligible for the federal free- and reduced-price meals, or FRPM, program), and the percent of student proficient or above on State assessments found that in middle schools and high schools, student performance on State assessments increased with school

---

[4] This summary is based on literature and analysis reported in the final school size report prepared for the Maryland Adequacy Study contract and is cited as follows. Humann, C., Palaich, R., Fermanich, M., and Griffin, S. (June 2015). *Final School Size Study: Impact of Smaller Schools*. Denver, CO: APA Consulting.

enrollment until enrollment reached 1,200 to 1,600 students. Performance began to decline in secondary schools with enrollment exceeding 1,600 students. The smallest secondary schools tended to be low performing. However, there were relatively few of these schools and in most cases these schools housed special programs for serving at risk students.

There was little relationship between school size and student performance at the elementary school level in schools with lower poverty concentrations (less than 60 percent FRPM). Student performance in higher poverty elementary schools was greatest in schools with enrollment between 450 and 650 students – a finding that is consistent with the school size literature. Schools that were both smaller and larger than this range produced somewhat lower performance.

The remainder of this memo provides more detail on 1) the research literature on school size and student achievement; 2) models of smaller schools or learning communities; 3) the impacts of school size on student achievement in Maryland; and 4) the impact of school size on school climate.

The Literature

Researchers have examined the correlation between school size and student achievement for many years. However, a confluence of events – investment in small schools by the Bill and Melinda Gates Foundation, a special project of the National Governor's Association (NGA), and investment from the U.S. Department of Education – brought renewed attention to the issue in the early 2000s, especially for high schools. These investments in smaller school models were accompanied by strategy and outcome evaluations, contributing to the current understanding of the impacts of small schools.

A meta-analysis of studies of small schools (Rochford, 2005) found that school size functions primarily as an enabler of improved student outcomes. The meta-analysis found that the schools that were able to improve student outcomes were also the schools that had decreased their enrollment numbers as part of a suite of related reform efforts. Early implementers and proponents of small schools speculated that, with fewer students, school staff would be able to form deeper and more supportive relationships with learners. Indeed, this hypothesis was proven to be true – but only in the schools that also changed their approaches to community engagement, instruction, and school structure.

First and foremost, these small schools benefited from leadership that both set a tone that encouraged personalization and distributed responsibility for reform efforts among multiple staff as well as the community at large. Successful small schools focused on improving the quality of instruction, often implementing new curricula or approaches to teaching. Teachers and leaders participated in professional development to learn new methods of content delivery and relationship-building skills. Teachers and leaders also participated in follow-up meetings to discuss implementation of these new skills. Furthermore, smaller schools were more successful when district leaders, boards of education, and community members were supportive of the work. In short, a school's staff, leaders, and surrounding community needed to work collaboratively to make the small school learning environment successful (Howley, 2002).

It is also critical to note that research shows smaller schools and smaller learning environments have an even more pronounced effect on children from low-income families (Friedkin & Necochea, 1988;

Greenwald, Hedges, & Laine, 1996). Indeed, in addition to improved grades and standardized test scores, low-income elementary-aged students attending small schools have better attendance, fewer behavior problems, and increased participation in extracurricular programs compared to low-income students in larger schools.

It is also true, however, that research around outcomes in smaller schools is not uniformly favorable. Several recent studies have found a performance advantage for larger schools (Steiner, 2011; Tanner & West, 2011). In the case of high schools, proponents of larger schools have argued that larger enrollments are needed to support more diverse course offerings (Conant, 1959; Hoagland, 1995). Other research, however, suggests that this advantage of larger schools may be overstated. Unks (1989) found that smaller schools provide a broader array of learning experiences than the published course offerings may suggest, while Monk (1987) found that the relationship between school size and curricular diversity begins to decrease with school enrollments above roughly 400 students.

Academic Achievement of Students in Need of Additional Learning Support

With the conflicting conclusions about the effects of school size on academic achievement, there is a growing sub-area of research focused on the benefits of smaller schools. Specifically, this research examines the degree to which smaller schools help students who need additional learning support. When examining this area of research, it can be challenging to isolate the effects of school size on academic achievement, since small school reforms often take place as part of a package, in combination with multiple other changes in policies, practices, or resources over time (Schwartz, Stiefel, & Wiswall, 2011).

There is a growing body of research identifying interventions and services that bolster the achievement of students receiving special education services, LEP students, and students living in poverty. Relationship-enhancing interventions are especially important for student populations that are, according to research, more prone to teacher-student relationship problems. Such students include boys, students living in poverty, students with disabilities, students from minority backgrounds, and students with problematic behaviors (Rathvon, 2008). As noted above, other interventions shown to be beneficial for students from low-income families are often part of the fabric of successful small school environments. Such interventions include strong parental engagement, personalized instruction, and collaborative, flexible approaches to meeting student needs. Thus, the academic achievement of students who need additional learning supports increases when certain academic tools and interventions are made part of the reform package. Such tools and interventions could include personalized learning, specialized curriculum, a distributed model of school leadership, and parent and community engagement. These tools and interventions are also often found in small school settings.

Small school achievement outcomes appear to be more pronounced for students who have traditionally shown lower levels of achievement (Darling-Hammond, Ross, & Milliken, 2006). This is evidenced in Unterman's (2014) report on New York City's Small Schools of Choice (SSC). The SSC student population, accepted on a lottery basis, is 94 percent minority. Eighty-four percent of SSC students are eligible for FRPM and 75 percent of them enter high school performing below grade level in reading or math.

Nevertheless, these SSCs are sending more students to college than other city schools: forty-nine percent of SSC students attend college, compared to an average of 40 percent at other city high schools.

Models of Smaller Schools

In the early 2000s, a number of funders invested in smaller learning communities and smaller schools as strategies to boost student achievement. These funders were guided by the hypothesis that smaller schools lead to better academic outcomes. Efforts were undertaken to determine if smaller, more personalized education settings would lead to improved academic achievement. In some cases, small schools did improve achievement, particularly for children in poverty. Overall, however, research shows school size as merely one of a collection of factors in improving student achievement. Parallel reforms and actions taken to help implement and support smaller school size models can also contribute greatly to overall improvements in student achievement.

Several comprehensive reform models have emerged for creating smaller schools or smaller learning environments. A number of factors – students, facilities, operating autonomy, and instructional philosophy – guide LEAs as they select models for smaller and more personalized learning environments. Some models, such as career academies and magnet schools, are learner-focused and seek to create community by bringing together students and staff who share particular interests and goals. Other models, like clusters and pods, are supported by facility design. These schools have been intentionally designed to accommodate a team-driven model of instruction. The terms *school within a school* and *school within a building* imply subtle differences, indicating varying levels of autonomy among multiple school administrators. There are also smaller learning communities guided by alternative educational philosophies. These communities include Montessori schools and foreign language immersion schools, among others.

A variety of terms have been used to describe small school models. In 2001, Cotton defined a number of common and relevant small school models. The broad categories of these models are described below.

School within a School/School within a Building

This model brings several small schools under one roof. More specifically, in a *school within a school* model, there is a building administrator or principal responsible for the entire physical plant and all schools, students, and teachers on a campus. In the *school within a building* model*,* principals are more autonomous and report directly to an LEA. Baltimore City, with support from the Bill and Melinda Gates Foundation, has created several schools that have adopted a *school within a school* model. The LEA calls these co-located schools. There are no standard definitions for these terms, rather individual districts define how they use each term.

Additional terms used to describe *school within a school* configurations include *minischool, multiplex, multischool,* and *scatterplex.* In Maryland*,* some LEAs have large schools clustered in a multischool or multiplex complex, such as the Old Mill Educational Complex in Anne Arundel County. The former Frederick Douglass High School in Baltimore City was transformed into a multiplex/multischool complex of small high schools.

Smaller Learning Communities

A smaller learning community is a term used to define an individual learning unit within a larger school. Teachers and their students are scheduled together and typically hold classes in shared, common areas of the school (Cotton, 2001).

Career Academies

Career academies provide a specialized, focused curriculum to support career exploration and preparation during high school, sometimes leading to job certification or receipt of credentials. The result is a *school within a school* environment that unites a group of peers with common long-term goals and interests. Other terms used to describe these smaller learning communities include *career clusters* and *career pathways* (Conley, D. & Rooney, K., January, 2007, & Guha, R. et al., 2014).

Autonomous Small Schools

Autonomous small schools, also referred to as *freestanding schools,* have independent governance and budget control. These schools have the ability to select both teachers and students. An autonomous small school sets its own schedule and defines its own learning program. It may share a building with another school, or may simply be a *historically small school,* located in a small building that limits enrollment. Maryland LEAs have experimented with autonomous small schools, namely in Baltimore City, where a contract was awarded to Edison Schools to manage a number of small schools in need of reform. The Edison Schools received per pupil funding from Baltimore City Schools, but had complete autonomy over staffing, curricula, and budget decisions that are normally approved at the LEA level. Charter schools are mostly autonomous small schools.

Alternative Schools

Alternative schools often provide nontraditional curriculum and educational methods, such as credit recovery or night school. Students have more flexibility in their programs of study and/or class schedules than they would in a traditional school. In the Maryland context, alternative schools often serve the needs of students who are not behaviorally successful in a traditional school setting and who may require a different environment from traditional classroom and school settings. These schools may be physically located within another school's building or in a separate building.

Magnet Schools or Theme-based Schools

Magnet and theme-based schools design curriculum and school activities around a particular area of study or theme. For these schools, community is built around a shared interest and experience regarding a particular subject. All classes are taught using the school's subject focus. For example, a visual arts magnet school might teach social studies concepts in the context of art history and geographic variations in artistic styles. Popular themes and subjects for theme-based schools include STEM, performing or visual arts, international studies, and world languages. Several Maryland LEAs have magnet schools, including foreign language immersion schools.

Impacts of School Size on Student Achievement in Maryland

The charts below show the average percentage of students in Maryland schools scoring proficient or advanced on state assessments, by ranges of school sizes, for each school level.[5] The horizontal axis of each chart shows the ranges of school sizes and the vertical axis shows the average composite performance score of students in each school size range. The composite score represents the percentage of all students in all subjects in a school achieving proficient or advanced on the state assessments.[6] In the case of elementary schools and middle schools, the data for schools with FRPM percentages less than or greater than 60 percent are shown separately.

Chart 1
Average Percentage of Students Attending Traditional High Schools Who Score Proficient and Higher on State Assessments, by School Size

	0-400	401-800	801-1200	1201-1600	1601-2000	>2001
■ Average % Proficient & Higher	60.82%	76.96%	84.79%	89.75%	88.25%	86.24%
Number of Schools	7	23	43	53	22	16
Number of LEAs	2	12	17	16	7	5
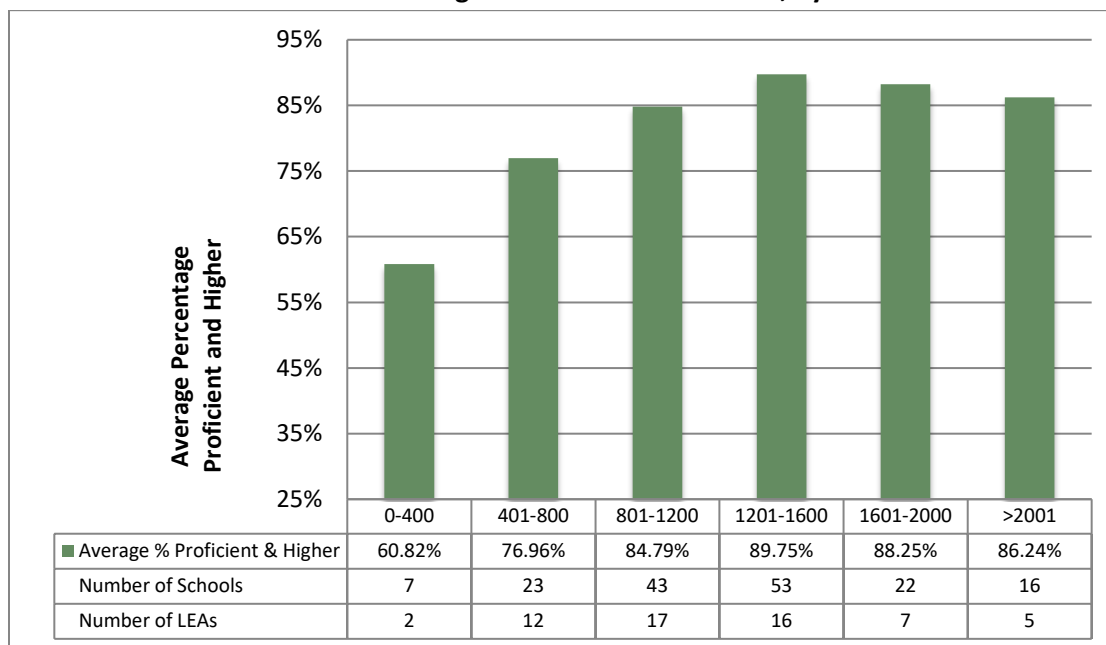
While the charts presented show the distribution of schools by size and student performance level, they do little to explain why the distribution of school performance across school size looks as it does. The multivariate analysis, reported in Appendix E, suggests that schools serving higher-need student populations will tend to experience lower levels of student achievement on state assessments.

As Chart 1, above, shows, high school achievement scores increase with school size up to a certain point, then begin to level off in schools enrolling more than 1,600 students. Based on data from 2013, student achievement is highest in schools that enroll 1,201 to 1,600 students. These schools represent 31

---

[5] No experimental studies we conducted for any part of this analysis, therefore all results are correlational and do not support causal claims.

[6] The state assessment used for elementary and middle schools is the 2012 Maryland School Assessment. For high schools the assessment is the 2013 Maryland High School Assessment. The subjects assessed consist of reading, mathematics, and science (in grades five and eight only) in elementary and middle schools, and English, algebra and biology in high schools.

percent of the traditional high schools across the state. Because FRPM-eligible students in high schools tend to be undercounted, the FRPM counts in many high schools were quite low. Thus, the sample size of schools with greater than 60 percent FRPM students was too small to include in the analysis reported above.

For the multivariate high school analysis, the school characteristics explained 75 percent of the variation in the composite test scores. Special education percentage, FRMP percentages, square footage per student, total enrollment, and staff salary expenditures per student were all significant predictors of student achievement and were all associated with lower test scores.

Chart 2
Average Percentage of Students Attending Traditional Middle Schools Who Score Proficient and Higher on State Assessments, by School Size

	0-300	301-600	601-900	901-1200	>1201
■ Average % Proficient and Higher FARM < 60%	79.07%	82.87%	85.24%	86.51%	91.31%
■ Average % Proficient and Higher FARM >60%	59.11%	58.72%	63.54%	62.92%	73.77%
Number of Schools FARM <60%	1	42	76	30	7
Number of Schools FARM >60%	1	13	26	6	1

Chart 2, above, shows that in the school size categories ranging from 301 to 1,200 students, average middle school performance on the composite state assessment scores increased gradually with larger school sizes. (The number of schools in the zero to 300 student and greater than 1,200 student school size categories are too small to draw any valid conclusions.) This is true both for schools with less than 60 percent FRPM students and for those with greater than 60 percent FRPM. However, average performance peaked in the 601 to 900 student school size category and declined in schools with enrollments between 901 and 1,200 students.

Chart 3

Percentage of Students Attending Traditional Elementary Schools Who Score Proficient and Higher on State Assessments, by School Size
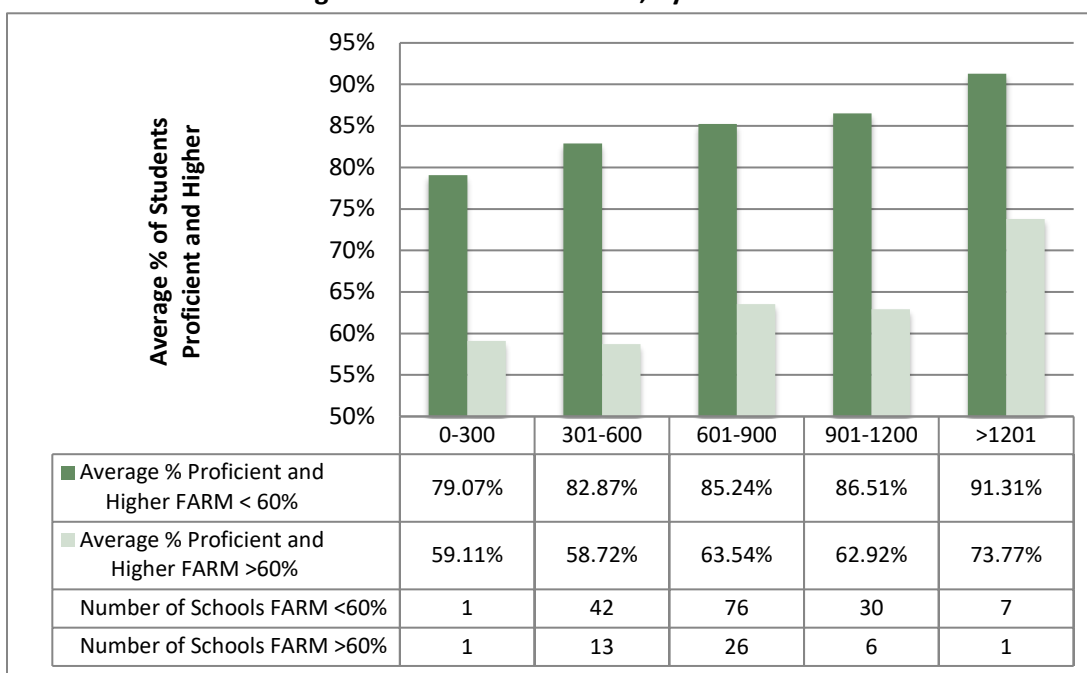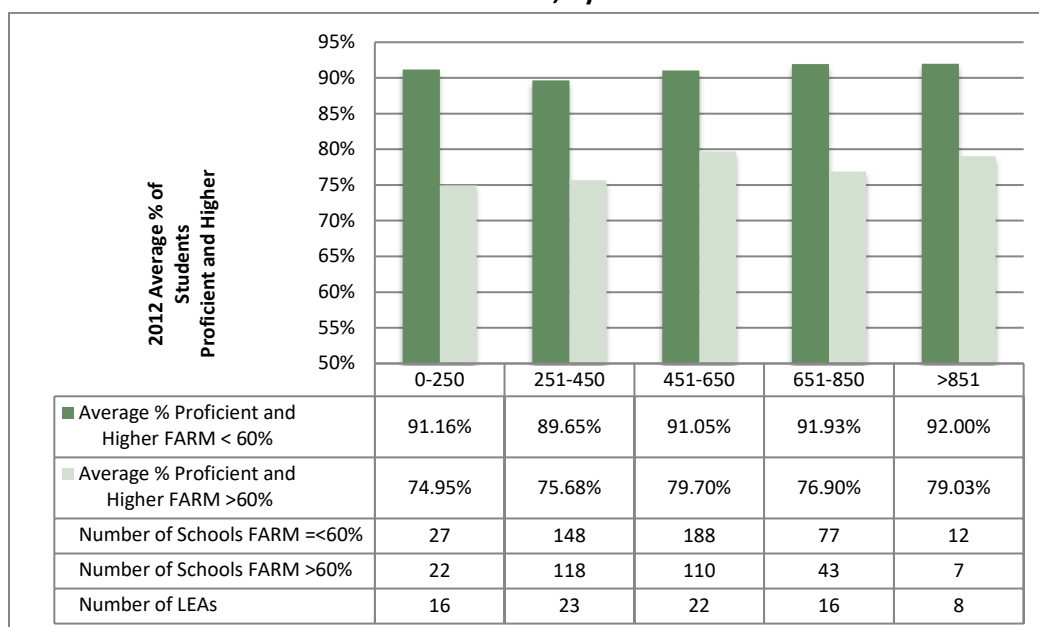
	0-250	251-450	451-650	651-850	>851
■ Average % Proficient and Higher FARM < 60%	91.16%	89.65%	91.05%	91.93%	92.00%
■ Average % Proficient and Higher FARM >60%	74.95%	75.68%	79.70%	76.90%	79.03%
Number of Schools FARM =<60%	27	148	188	77	12
Number of Schools FARM >60%	22	118	110	43	7
Number of LEAs	16	23	22	16	8

Y-axis: 2012 Average % of Students Proficient and Higher

The Maryland elementary school data in Chart 3, above, show that school size has little impact on achievement, regardless of the level of poverty in a school. This result is in contrast to the apparent performance advantage found in larger middle and somewhat larger high schools. However, average school achievement peaked in schools with greater than 60 percent FRPM students that also had enrollments between 451 and 650 students.

It is important to note that the data presented above represent merely a snapshot in time and not trend data. It is also important to note that the descriptive data presented in the charts shown above show the distribution of schools by the relationship between school size and average school performance on state assessments. However, the charts cannot show the interactions between size, spending, and performance.

It is telling that, at first glance, school size does not appear to be a main driver of student achievement in the traditional schools in Maryland. Also, as noted above in the analysis of school size and cost, the smallest schools, particularly at the middle and high school levels, consist largely of schools designed to provide focused or special programs, which tends to be associated with both higher per student costs and lower levels of performance.

Impacts of School Size on School Climate

Extracurricular Activities Participation

The research related to extracurricular participation (EP) in high school focuses on the correlation between EP and socioeconomic status, academic achievement, self-esteem, and school size. The school size research compares participation at smaller high schools (defined as having enrollments under 800) to participation at larger high schools (defined as having enrollments greater than 1,600). Enrollment size is often associated with other community characteristics that contribute to EP. For example, smaller schools are often located in rural areas, where the high school is the hub of community attention and activity. Research suggests that students in rural areas feel a greater sense of opportunity, even responsibility, to participate in activities like sports or plays. This results in students participating in multiple activities over the course of the school year. Students who attend large, urban high schools often have EP readily available outside of school through other venues, such as parks and recreation programs or competitive youth sports that allow student athletes to specialize in specific sports or other activities, resulting in participation in a narrower range of activities within the high school setting.

Overall, research on the impact of school size on EP has competing findings. Larger schools tend to offer more varied opportunities that include expanded student government and volunteerism choices, enhancing the likelihood that students will be able to find an activity of personal interest (Lay, 2007). Yet Coladarci and Cobb (1996) found that EP was higher among students attending smaller high schools than those attending larger high schools. There is agreement in the research that larger high schools offer a greater variety of activities, which provides greater opportunities for more students to participate. While smaller schools have a narrower range of opportunities, it also is more likely that the students feel encouraged or compelled to participate in multiple, varied activities throughout the school year.

Unfortunately, data on school-level participation in extracurricular activities in Maryland are not readily available. Because both the Maryland Public Schools Secondary School Athletic Association and the Maryland Association of Student Councils track and report student participation by LEA, data are only available on trends in LEA-level participation. For example, according to the annual High School Athletics Participation Survey conducted by the National Federation of State High School Associations, participation in high school athletics in Maryland has steadily increased as a percentage of the student population over the past decade. In the 2013-14 school year, total participation in extracurricular activities was 116,104 students, or 15.4 percent of total high school enrollment. This represents increased participation since the 2004-05 school year, which totaled 100,305 students, or 12.8 percent of total high school enrollment.

Without school-level participation data, however, an analysis of the relationship between school size and participation is not possible.

Teacher and Student Satisfaction and School Climate

Surveys of school staff show that smaller schools tend to cultivate better attitudes towards work among school administrators and teachers, leading to greater staff collaboration and more successful school

improvement efforts (Cotton, 1996; Klonsky, 2006). The likely causes of this effect include the more favorable school climates and deeper personal relationships found in smaller schools (Cotton, 1996). Still, it is difficult to attribute improved teacher satisfaction solely to school size. Often, smaller schools employ other strategies that may also improve educator satisfaction. For example, small schools may use a distributed leadership model and may enjoy greater support from the district office. Both of these factors have been found to have positive impacts on teacher satisfaction and motivation (Rochford, 2005). As noted in the review of literature, teacher satisfaction and connection to students rises when school enrollment decreases.

The feelings and attitudes that are elicited by a school's environment are referred to as school climate (Loukas, 2007). Advocates for smaller learning communities and schools posit that school climates would be more favorable in smaller schools. Research is showing that perceptions of school climate also influence student behavioral and emotional problems. Additionally, researchers have identified several characteristics of smaller schools that may explain their positive effects on student performance. Key among these characteristics is the presence of a supportive school climate. Some smaller schools are found to be more successful at developing personal and informal relationships among school staff, students, and parents than larger schools serving similar student populations. Such relationships lead to improved student engagement and student social behavior, broader participation in extracurricular activities, heightened teacher satisfaction and collaboration, and increased parent involvement (Lee and Loeb, 2000). These positive effects are even more pronounced for low-income and minority students, who tend to have higher attendance rates and lower dropout rates in smaller schools (Carruthers, 1993). A study in North Carolina specifically identified the positive impact of smaller schools on school climate, leading to recommendations for much smaller school sizes to prioritize school climate, and larger school sizes to prioritize operating efficiency (North Carolina Department of Public Instruction, 1998). A 2001 meta-analysis of research on school size notes increased attendance and fewer behavior problems among students attending elementary schools with enrollments under 500 (Rochford, 2005).

Smaller schools tend to have fewer incidences of negative student social behavior than large schools, resulting in greater student engagement and satisfaction, higher attendance rates, and lower dropout rates. Again, the research suggests that ethnic minority and low-income students, in particular, benefit from the supportive school climate that is often present at smaller schools (Cotton, 1996).

Schools suspensions are a key indicator of school climate. Therefore, to explore the relationship between school size and school climate in Maryland, the study team analyzed school level suspension data provided by MSDE. The study team plotted the combined in-school and out-of-school suspensions by school. In the case of elementary schools and middle schools, the data for schools with FRPM percentages less than and greater than 60 percent are shown separately in the charts below. The horizontal axis of each chart shows the ranges of school sizes with the vertical axis showing the number of suspensions per 100 students for traditional high, middle, and elementary schools.[7]

---

[7] No experimental studies we conducted for any part of this analysis, therefore all results are correlational and do not support causal claims.

For the three school levels, school size does not appear to be a significant predictor of suspension numbers. Chart 4 shows the number of suspensions per 100 students in Maryland high schools. These data show that suspension rates actually begin to decline as school sizes rise above 1,000 students.

Chart 4
Average Number of Suspensions Per 100 Students Attending Traditional High Schools

	0-400	401-800	801-1200	1201-1600	1601-2000	>2001
Average Number of Suspensions per 100 Students	23.4	24.7	22.0	13.0	9.8	9.9
Number of Schools	7	23	43	53	22	16
Number of LEAs	2	12	17	16	7	5
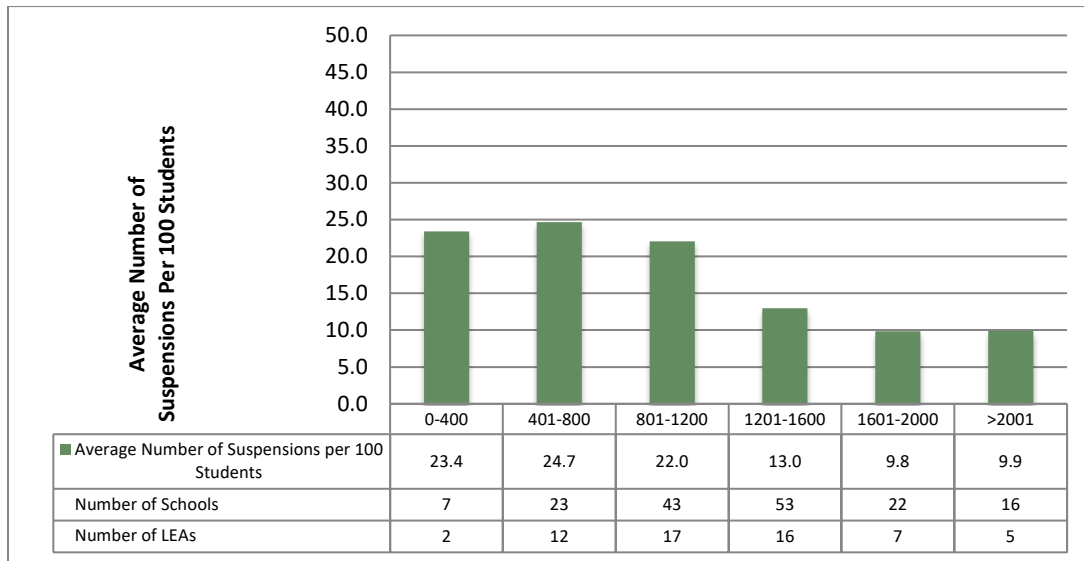
Chart 5 shows that the trend toward lower suspension rates in larger schools is less definitive in middle schools, especially in schools with higher concentrations of FRPM students. In middle schools with under 60 percent FRPM students, suspensions per 100 students decrease as school enrollments increase. Large schools (over 1,201 students) with less than 60 percent FRPM students, have only about a quarter of the number of suspensions found in the smallest schools. In those schools with greater than 60 percent FRPM students, the suspension rate declines more gradually than at the lower poverty schools and actually begin to increase as schools become very large (school with more than 1,200 students).

Chart 5
Average Number of Suspension Per 100 Students Attending Traditional Middle Schools

	0-300	301-600	601-900	901-1200	>1201
■ Average Number of Suspensions per 100 Students FARM <60%	35.5	22.1	18.0	16.2	8.7
▢ Average Number of Suspensions per 100 Students FARM >60%	35.6	33.0	26.3	21.5	28.2
Number of Schools FARM <60%	1	42	76	30	7
Number of Schools FARM >60%	1	13	26	6	1
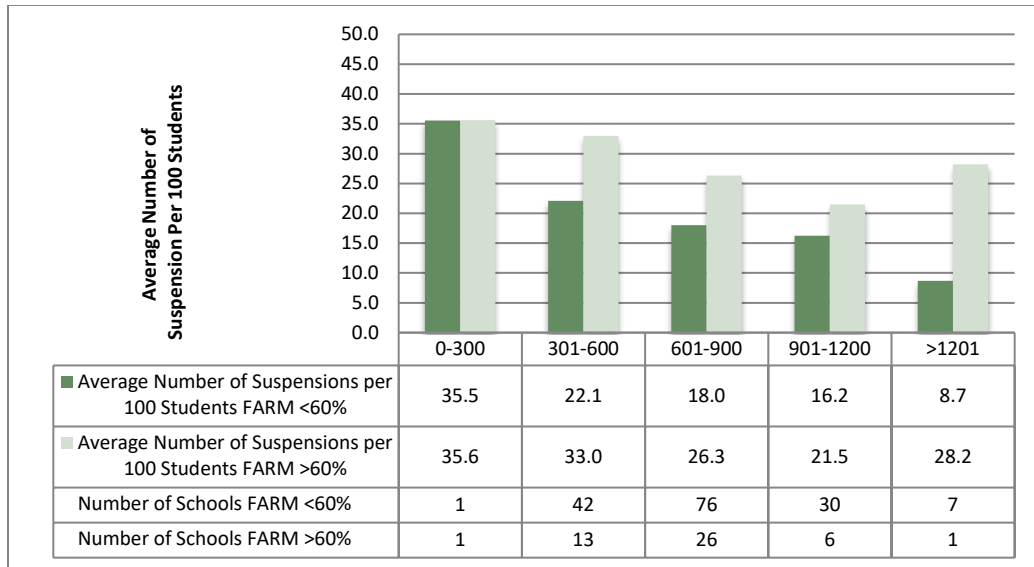
Chart 6, below, shows the suspension rates for elementary schools. The two sets of bars represent schools with concentrations of FRPM students below 60 percent (the darker-colored bars) and schools with concentrations above 60 percent (the lighter-colored bars). The suspension rates for schools with lower concentrations of FRPM students are fairly consistent across the school size categories but show a slight increase in the largest schools – those with enrollments greater than 850 students. Surprisingly, suspension rates decline in schools with higher concentrations of FRPM students as enrollment increases.

Chart 6

Average Number of Suspensions Per 100 Students Attending Traditional Elementary Schools

	0-250	251-450	451-650	651-850	>851
■ Average Number of Suspensions per 100 Students FARM <60%	1.34	1.94	1.67	1.53	1.88
▢ Average Number of Suspensions per 100 Students FARM >60%	6.30	5.11	3.99	3.23	2.14
Number of Schools FARM =<60%	27	148	188	77	12
Number of Schools FARM >60%	22	118	110	43	7
Number of LEAs	16	23	22	16	8

18
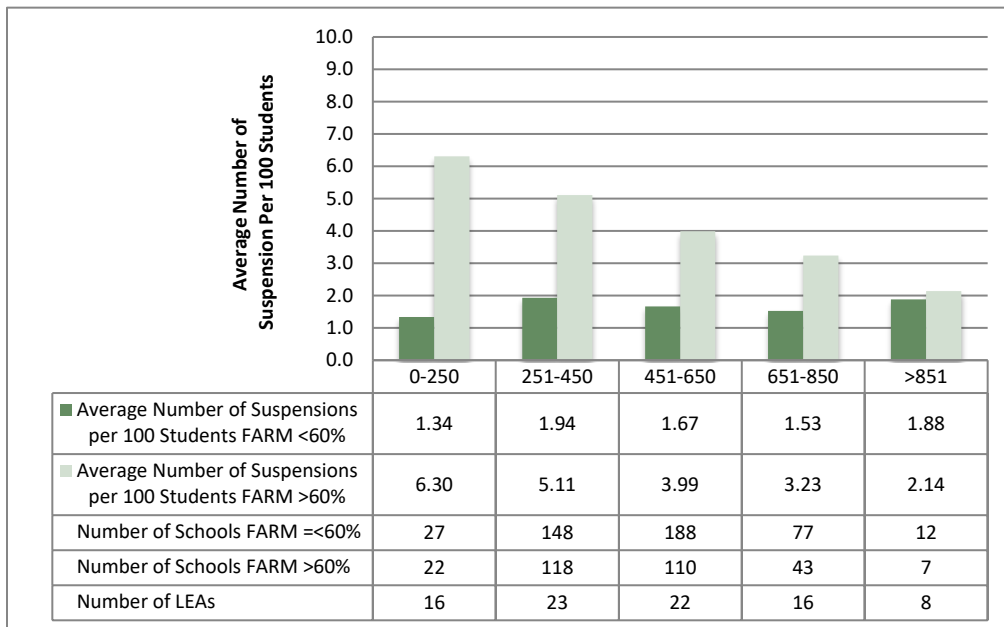
List of Successful Schools

Table 4 presents the characteristics of the 111 initial successful schools, which are then listed in Table 5, beginning on the following page.

Table 4
Characteristics of Initial 111 Schools Selected for Successful Schools Adequacy Study

Performance Category	Elementary Schools	Middle Schools	High Schools	Total Schools
Schools by Level	65	29	17	111
Percent by Level	59%	26%	15%	100%
High-Performing	57	25	17	99
High-Growth	8	4	0	12
Average Enrollment	540	804	1,571	636
Average FRPM	18%	15%	9%	14%
Average LEP	8%	2%	1%	4%
Average Special Education	9%	8%	7%	8%

Table 6
Initial Selection of 111 Schools for Successful Schools Adequacy Study

Local School System		School #	School	Selection Category	Selection Criteria	Level
01	Allegany	0702	Bel Air Elementary	High Performance	>=95% P/A	E
02	Anne Arundel	2052	Arnold Elementary	High Performance	>=95% P/A	E
02		3013	Arundel High	High Performance	>=95% P/A	H
02		2072	Benfield Elementary	High Performance	>=95% P/A	E
02		2092	Cape St. Claire Elementary	High Performance	>=95% P/A	E
02		3082	Crofton Woods Elementary	High Performance	>=95% P/A	E
02		4122	Davidsonville Elementary	High Performance	>=95% P/A	E
02		2102	Folger Mckinsey Elementary	High Performance	>=95% P/A	E
02		2152	Jones Elementary	High Performance	>=95% P/A	E
02		2243	Magothy River Middle	High Performance	>=90% P/A	M
02		2413	Severn River Middle	High Performance	>=90% P/A	M
02		2202	Severna Park Elementary	High Performance	>=95% P/A	E
02		2013	Severna Park High	High Performance	>=95% P/A	H
02		2043	Severna Park Middle	High Performance	>=90% P/A	M
02		2432	Shipley's Choice Elementary	High Performance	>=95% P/A	E
02		2372	Windsor Farm Elementary	High Performance	>=95% P/A	E
03	Baltimore County	1001	Carroll Manor Elementary	High Performance	>=95% P/A	E
03		0916	Cromwell Valley Elementary Technology	High Performance	>=95% P/A	E
03		1404	Fullerton Elementary	High Performance	>=95% P/A	E
03		0772	Hereford High	High Performance	>=95% P/A	H
03		0855	Hereford Middle	High Performance	>=90% P/A	M
03		1002	Jacksonville Elementary	High Performance	>=95% P/A	E
03		1104	Kingsville Elementary	High Performance	>=95% P/A	E
03		0803	Lutherville Laboratory	High Performance	>=95% P/A	E
03		0811	Pinewood Elementary	High Performance	>=95% P/A	E
03		0809	Riderwood Elementary	High Performance	>=95% P/A	E
03		0852	Ridgely Middle	High Performance	>=90% P/A	M
03		0907	Rodgers Forge Elementary	High Performance	>=95% P/A	E

Local School System		School #	School	Selection Category	Selection Criteria	Level
03		0701	Seventh District Elementary	High Performance	>=95% P/A	E
03		0905	Stoneleigh Elementary	High Performance	>=95% P/A	E
03		0310	Summit Park Elementary	High Performance	>=95% P/A	E
03		0805	Timonium Elementary	High Performance	>=95% P/A	E
04	Calvert	0217	Huntingtown High School	High Performance	>=95% P/A	H
04		0312	Mount Harmony Elementary	High Performance	>=95% P/A	E
04		0314	Northern High	High Performance	>=95% P/A	H
04		0315	Northern Middle	High Performance	>=90% P/A	M
04		0216	Plum Point Middle	High Performance	>=90% P/A	M
05	Caroline	0802	Colonel Richardson Middle School	High Growth	>40% Growth, >80% P/A 2012	M
06	Carroll	0507	Liberty High	High Performance	>=95% P/A	H
06		0406	Mechanicsville Elementary	High Performance	>=95% P/A	E
06		1306	Mount Airy Middle	High Performance	>=90% P/A	M
06		0508	Oklahoma Road Middle	High Performance	>=90% P/A	M
06		0509	Piney Ridge Elementary	High Performance	>=95% P/A	E
06		0504	Sykesville Middle	High Performance	>=90% P/A	M
10	Frederick	0204	Lincoln Elementary	High Growth	>40% Growth, >80% P/A 2012	E
10		0313	Middletown High	High Performance	>=95% P/A	H
10		0311	Middletown Middle	High Performance	>=90% P/A	M
10		1604	Myersville Elementary	High Performance	>=95% P/A	E
10		0713	Urbana High	High Performance	>=95% P/A	H
10		0716	Urbana Middle	High Performance	>=90% P/A	M
10		0714	Windsor Knolls Middle	High Performance	>=90% P/A	M
12	Harford	0386	Fallston Middle School	High Performance	>=90% P/A	M
13	Howard	0509	Atholton High	High Performance	>=95% P/A	H
13		0406	Bushy Park Elementary	High Performance	>=95% P/A	E
13		0214	Centennial High	High Performance	>=95% P/A	H
13		0210	Centennial Lane Elementary	High Performance	>=95% P/A	E
13		0505	Clarksville Elementary	High Performance	>=95% P/A	E
13		0521	Clarksville Middle	High Performance	>=90% P/A	M
13		0307	Folly Quarter Middle	High Performance	>=90% P/A	M

Local School System		School #	School	Selection Category	Selection Criteria	Level
13		0404	Glenelg High	High Performance	>=95% P/A	H
13		0405	Glenwood Middle	High Performance	>=90% P/A	M
13		0606	Hammond Elementary	High Performance	>=95% P/A	E
13		0203	Howard High	High Performance	>=95% P/A	H
13		0526	Lime Kiln Middle	High Performance	>=90% P/A	M
13		0208	Northfield Elementary	High Performance	>=95% P/A	E
13		0523	Pointers Run Elementary	High Performance	>=95% P/A	E
13		0605	Thunder Hill Elementary	High Performance	>=95% P/A	E
13		0306	Triadelphia Ridge Elementary	High Performance	>=95% P/A	E
13		0215	Waverly Elementary	High Performance	>=95% P/A	E
13		0213	Worthington Elementary	High Performance	>=95% P/A	E
15	Montgomery	0420	Bannockburn Elementary	High Performance	>=95% P/A	E
15		0607	Bells Mill Elementary	High Performance	>=95% P/A	E
15		0333	Benjamin Banneker Middle	High Growth	>40% Growth, >80% P/A 2012	M
15		0226	Beverly Farms Elementary	High Performance	>=95% P/A	E
15		0410	Bradley Hills Elementary	High Performance	>=95% P/A	E
15		0606	Cabin John Middle School	High Performance	>=90% P/A	M
15		0604	Carderock Springs Elementary	High Performance	>=95% P/A	E
15		0511	Cashell Elementary	High Performance	>=95% P/A	E
15		0351	Darnestown Elementary	High Performance	>=95% P/A	E
15		0209	Lakewood Elementary	High Performance	>=95% P/A	E
15		0413	North Bethesda Middle	High Performance	>=90% P/A	M
15		0812	Parkland Middle	High Growth	>40% Growth, >80% P/A 2012	M
15		0601	Potomac Elementary	High Performance	>=95% P/A	E
15		0237	Robert Frost Middle School	High Performance	>=90% P/A	M
15		0603	Seven Locks Elementary	High Performance	>=95% P/A	E
15		0405	Somerset Elementary	High Performance	>=95% P/A	E
15		0653	Stone Mill Elementary	High Performance	>=95% P/A	E
15		0234	Thomas S. Wootton High	High Performance	>=95% P/A	H
15		0428	Thomas W. Pyle Middle School	High Performance	>=90% P/A	M
15		0216	Travilah Elementary	High Performance	>=95% P/A	E

Local School System		School #	School	Selection Category	Selection Criteria	Level
15		0427	Walt Whitman High	High Performance	>=95% P/A	H
15		0424	Walter Johnson High	High Performance	>=95% P/A	H
15		0235	Wayside Elementary	High Performance	>=95% P/A	E
15		0408	Westbrook Elementary	High Performance	>=95% P/A	E
15		0412	Westland Middle	High Performance	>=90% P/A	M
15		0602	Winston Churchill High	High Performance	>=95% P/A	H
15		0422	Wyngate Elementary	High Performance	>=95% P/A	E
16	Prince George's	1709	Chillum Elementary	High Growth	>40% Growth, >80% P/A 2012	E
16		1725	Cool Spring Elementary	High Growth	>40% Growth, >80% P/A 2012	E
16		1214	Glassmanor Elementary	High Growth	>40% Growth, >80% P/A 2012	E
16		1408	Glenn Dale Elementary	High Growth	>40% Growth, >80% P/A 2012	E
16		1712	Lewisdale Elementary	High Growth	>40% Growth, >80% P/A 2012	E
16		2007	Woodridge Elementary	High Growth	>40% Growth, >80% P/A 2012	E
18	Saint Mary's	0806	Town Creek Elementary	High Performance	>=95% P/A	E
19	Somerset	1303	Somerset 6/7 Intermediate School	High Growth	>40% Growth, >80% P/A 2012	M
21	Washington	0403	Clear Spring High	High Performance	>=95% P/A	H
21		0704	Smithsburg Middle	High Performance	>=90% P/A	M
23	Worcester	1001	Ocean City Elementary	High Performance	>=95% P/A	E
23		0312	Showell Elementary	High Performance	>=95% P/A	E
23		0308	Stephen Decatur Middle	High Performance	>=90% P/A	M
30	Baltimore City	0023	Wolfe Street Academy	High Growth	>40% Growth, >80% P/A 2012	E

Commission on Innovation and Excellence in Education

William E. Kirwan
Chairman

January 9, 2017

The Honorable Larry Hogan
The Honorable Thomas V. Mike Miller, Jr.
The Honorable Michael E. Busch
The Honorable Joan Carter Conway
The Honorable Edward J. Kasemeyer
The Honorable Sheila E. Hixson
The Honorable Maggie McIntosh

Ladies and Gentlemen:

As required by Chapters 701 and 702 of the 2016 session, I am pleased to submit this interim report of the Commission on Innovation and Excellence in Education. First, I want to thank you for appointing such a knowledgeable and diverse group of individuals who, to a person, are dedicated to addressing the education needs and interests of Maryland's students.

We have just begun our exploration of the wide ranging charges and responsibilities for this commission that are stated in the legislation. Therefore, as an interim report, this letter makes no recommendations for actions. It does, however, contain a synopsis of our activities thus far, as well as our vision for the work we will embark on during 2017, leading to our final report and recommendations presented to you in December 2017.

Our first meeting was held on September 29, 2016, with the main goal of introducing ourselves, providing background information for the commission, and reviewing the charge of the commission. Specifically, Dr. Karen B. Salmon, State Superintendent of Schools, presented an overview of education policy since 2002, the year in which the Commission on Education Finance, Equity, and Excellence, known as the Thornton Commission, completed its work. The Department of Legislative Services provided an overview of education funding in Maryland since 2002. Finally, the Maryland State Department of Education presented an update on the study of adequacy of education funding in Maryland by Augenblick, Palaich, and Associates (APA), as well as additional reports on various adequacy-related topics that APA produced.

During the second meeting, which was held on October 31, 2016, the commission focused on the federal and international landscape of education policy in terms of accountability and student performance. Lee Posey from the National Conference of State Legislatures (NCSL) presented an overview of the federal Every Student Succeeds Act as well as summarized a report recently completed by NCSL in collaboration with a group of legislators and legislative staff from various states called *No Time to Lose: How to Build a World-Class Education System State by State*. The commission then heard from Marc Tucker with the National Center on Education and the Economy (NCEE), who presented lessons learned from top performing education systems in other countries and in the United States, such as Massachusetts. Finally, David Driscoll, the former Commissioner of Education in Massachusetts, joined Mark Tucker for a discussion of how Massachusetts implemented education reforms that led to Massachusetts becoming a top performing system in the world.

On December 8, 2016, APA presented its *Final Report of the Study of Adequacy of Funding for Education in Maryland* to the commission and recommendations for altering the current education funding formulas and requirements. In total, APA recommended increasing prekindergarten to grade 12 (P-12) funding by $2.9 billion, including a $1.9 billion increase in State funds and $1.0 billion in local funds. The recommendations are summarized in the Issue Papers for the 2017 legislative session prepared by the Department of Legislative Services, which can be found here: http://mgaleg.maryland.gov/Pubs/legislegal/2017rs-Issue-Papers.pdf#page=76

During the December 8, 2016, meeting, Julie Bell with NCSL described the *No Time to Lose* report in more depth by identifying four common elements that can be seen in top-performing nations' education systems and the next steps that states can take, including benchmarking current state policies against top-performing systems and conducting a gap analysis. Finally, Betsy Brown Ruzzi, with NCEE, reviewed the results from the latest administration of the Programme for International Student Assessment (PISA) that were announced on December 7, 2016. PISA is an international comparative study of 15-year-old students' knowledge of mathematics, reading, and science conducted every three years. The United States average student performance in science and reading was flat, ranking twenty-fourth and twenty-fifth, respectively, out of the 72 international education systems participating in PISA 2015; this is about the same as the PISA 2012 results for the United States. However, U.S. students' performance overall dropped to fortieth in mathematics. Massachusetts moved up in the international rankings, to fifth in reading, ninth in science, and thirty-fourth in math, if Massachusetts and other subnational systems (*e.g.*, Ontario, Canada) were countries.

The commission concluded the December 8 meeting by agreeing to use the four common elements of world-class education systems from the NCSL report as its framework to evaluate Maryland's education system and make recommendations for funding and innovative policies aimed at moving Maryland's education system from one of the best in the United States to one of the best in the world.

While that concluded our work during the 2016 interim, the commission will also be meeting on January 9, 2017, to hear about structuring the education system to retain existing and produce more high-quality teachers and principals. The commission will also discuss the benchmarking process that will be used to evaluate Maryland's education system so that this work can be completed while the commission itself take a hiatus during the legislative session. While the commission will not hold meetings during the legislative session, commission members will have ample time to read through the APA report to prepare for the work of the commission during the 2017 interim.

Should you wish to view any of our meetings or review the materials that have been presented to us, you may use this link: http://mgaleg.maryland.gov/Pubs/CommTFWorkgrp/2016-Innovation-Excellence-in-Education-Commission.pdf. We look forward with great enthusiasm to continuing our work and presenting you with a comprehensive report responsive to your charge in December 2017.

Sincerely,

William E. Kirwan
Chair

WEK/RHH/mlm

Enclosure

cc: Member, Commission on Innovation and Excellence in Education

Commission on Innovation and Excellence in Education
2016 Interim
Membership Roster

William E. Kirwan, Chair

Commission Members

David R. Brinkley
Robert L. Caret
Scott E. Dorsey
Chester E. Finn
Stephen H. Guthrie
David E. Helfman
Kalman R. Hettleman
Delegate Adrienne A. Jones
Delegate Anne R. Kaiser
Senator Nancy J. King
Elizabeth Ysla Leight
Senator Richard S. Madaleno, Jr.
Delegate Maggie McIntosh
Leslie R. Pellegrino
Senator Paul G. Pinsky
Craig L. Rice
Karen B. Salmon
Joy Schaefer
Morgan Showalter
David M. Steiner
William (Bill) R. Valentine
Senator Steve Waugh
Delegate Alonzo T. Washington
Margaret E. Williams

Commission Staff

Rachel H. Hise
Erika S. Schissler