BUILDING SUPPORT FOR RICHMOND PUBLIC SCHOOL TEACHERS

Applied Policy Project

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FOR RICHMOND PUBLIC SCHOOLS

Frank Batten School of Leadership and Public Policy
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RPS RICHMOND PUBLIC SCHOOLS

UNIVERSITY of VIRGINIA

FRANK BATTEN SCHOOL of LEADERSHIP and PUBLIC POLICY

“What the educator does in teaching is to make it possible for the students to become themselves.”

–Paulo Freire

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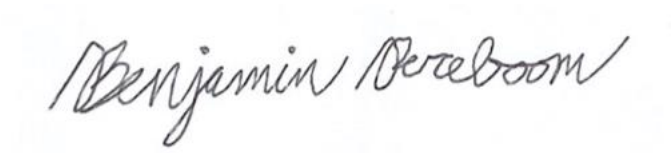
Acknowledgements

There are several individuals I would like to thank for making this project possible. First and foremost, I would like to recognize the hard work and dedication of Taryn Crawley, Helen Mickens DeMena, and the Richmond Public Schools Talent Acquisition Office. My experience as a summer intern and subsequent work for this project have had an indelible impact on me, and I promise to bring the perspectives I have gained into my career serving the public. I would also like to recognize both of my project advisors, Professors Lucy Bassett and Raymond Scheppach, for helping me shape this project and providing excellent feedback. I also want to express my gratitude to my father and mother, Maarten Pereboom and Ruth Baker, as well as my brother, Max, and finally Katie for their unwavering support.

Working with RPS has been an honor and a privilege, and I wish them all the best as they continue to diligently serve Richmond's students and families.

Honor Statement

On my honor as a student, I have neither given nor received unauthorized aid on this assignment.



Disclaimer

The author conducted this study as part of the program of professional education at the Frank Batten School of Leadership and Public Policy, University of Virginia. This paper is submitted in partial fulfillment of the course requirements for the Master of Public Policy degree. The judgments and conclusions are solely those of the author, and are not necessarily endorsed by the Batten School, by the University of Virginia, or by any other agency.

Executive Summary

Richmond Public Schools [RPS] retain certified teachers at a significantly lower rate than the rest of Virginia. Low teacher retention rates levy heavy administrative costs on RPS, hinder performance at the classroom and administrative levels, and ultimately create poorer student outcomes. Furthermore, RPS must also rely on new and provisionally licensed teachers at a rate more than double the state average—15% as opposed to 6.3%. Supporting new teachers in the provisional-to-full licensure process is a key consideration in this project. Inspired by the RPS strategic plan, Dreams4RPS, this analysis outlines three objectives to be addressed through policy interventions.

1. Reduce the number of qualified teachers that exit RPS each year
2. Improve recruitment of qualified teachers to RPS
3. Accelerate and elucidate the qualification process for provisionally licensed teachers

After exploring key issues and possible interventions in the literature, I articulate four policy alternatives that improve various aspects of the teacher experience in accordance with Dreams4RPS action items:

1. Hire licensure coordinator/career counselors to oversee each of Richmond Public Schools' nine districts
2. Targeted financial incentives for teachers in high-needs schools ($1,000 per year) with $500-$750 phase-in period for first two years
3. Condense salary schedule from 45 to 30 years while retaining top salary rate
4. $600,000 professional development fund for teachers and administrators

Each of these policy initiatives is evaluated in relation to administrative and political feasibility, equity, and cost effectiveness criteria. Due to consistent performance across all four criteria, I recommend that RPS implements Alternatives 1 and 2. Improving teacher recruitment, licensing, and retention in the long term is integral as RPS continues to recover from the COVID-19 pandemic and improve as an institution. As the first school district to grant collective bargaining rights to its teachers, Richmond should be prepared to directly address current inadequacies related to teacher experience. Increased resources and public attention toward education provides RPS with a unique opportunity to promote administrative synergy and strong support systems to better outcomes for administrators, teachers, and ultimately students.

I. Introduction

Compared to the rest of Virginia, low teacher retention rates levy heavy administrative costs on RPS, hinder performance at the classroom and administrative levels, and ultimately create poorer outcomes for students and teachers, alike. In addition, this also leads RPS to rely on new and provisionally licensed teachers such they currently make up about 15% of the workforce; the state average is 6.3% (VDOE, 2021). For this analysis, the provisional process is defined as the three-year period during which new teachers complete various requirements in pursuit of their full renewable license (depending on extensions). To mitigate this issue and improve performance outcomes, RPS must implement new policies to reduce teacher retention to at least the national average (84%), hire more qualified teachers, and improve transparency and efficiency for the provisional-to-full licensing process. Critical to achieving these goals is addressing economic incentives, barriers to entry for teachers, the hiring process, professional development, and working conditions (Castro et al., 2022).

II. Problem Statement

There are too few certified teachers in Richmond Public Schools.

III. Examining Teacher Retention

Measuring Teacher Retention

For this analysis, teacher retention is defined as the number of "full-time" teachers (at least 0.75 full-time equivalent) in RPS in a given school year as indicated by Richmond Public Schools' current strategic plan for 2018-2023, Dreams4RPS (Hudacsko, 2019). The retention rate is percentage of those teachers who return for the following academic year. For example, in a year where RPS begins with 1,600 teachers and ends with 1,200, the retention rate would be 75 percent.

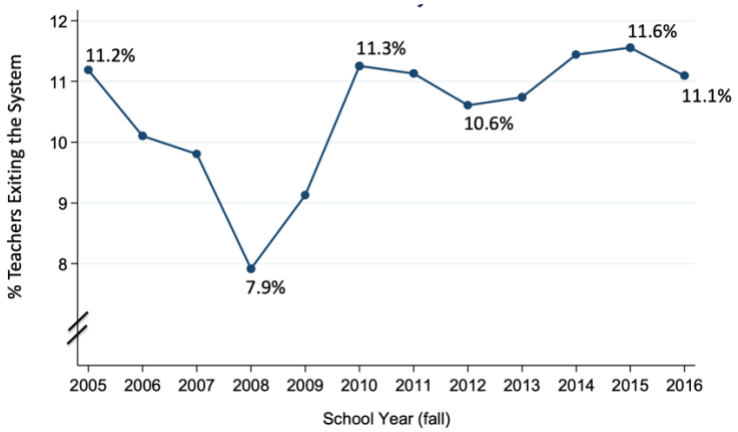
- Teachers who return to RPS in a part-time capacity are counted as retained
- If a teacher returns the following school year but moves out of the classroom into an administrative or other nonteaching role, they are NOT counted as retained
- Terminations and retirements are counted as teachers who are not retained

Ongoing Teacher Attrition Across Virginia

RPS suffers from the same obdurate problems that other American urban public-school systems do; everything from subpar building conditions to lack of quality teachers all contribute to low student achievement, poor behavioral outcomes, and high absenteeism (teacher and student) among myriad other issues (Truong, 2019). In Virginia and beyond, American public education faces an uncertain future as it emerges from the COVID-19 pandemic. According to a recent survey by the National Education Association [NEA], the nation's most prominent teachers' union, 32 percent of teachers plan to leave the profession earlier than they anticipated as result of COVID-related stress (Walker, 2021). Over the last three years, the number of unfilled teaching positions across Virginia has spiked by nearly 62 percent, rising from 877 in the 2018-19 school year to 1,420 in 2020-21, according to VDOE data Education (Masters, 2021). Among the many reasons for low teacher retention are low relative wages, lack of

administrative support, dissatisfaction with testing and other standards, and other aspects related to working conditions (Loewus, 2021) While the teacher shortage predates the COVID-19 pandemic, the teacher labor market is sure to be impacted over the next ten years at least. According to the graph below, which is the last definitive study on teacher attrition in Virginia, teacher retention rates tend to be standard in relation to national averages.

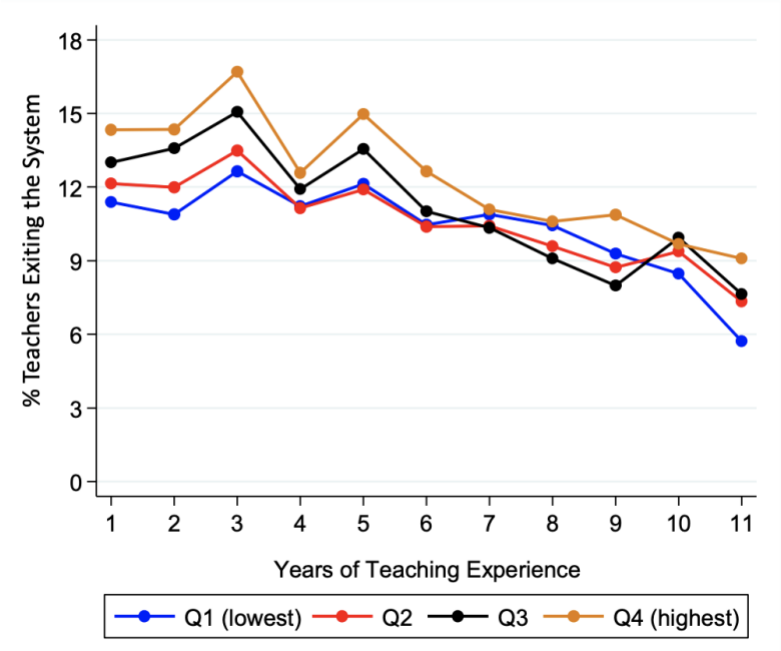
Figure 1: Teacher Exit Rates in Virginia



Courtesy: Miller, L.C. (2018). A First Look at Teacher Retention in Virginia. University of Virginia, Curry School of Education/Frank Batten School of Leadership and Public Policy. https://education.virginia.edu/sites/default/files/uploads/epw/Teacher_Retention_PPT_Slides2.pdf

According to a 2019 report by the Economic Policy Institute, when accounting for teacher quality indicators (certification, training, experience), the magnitude of the teacher shortage grows even more dire, especially in high-poverty schools (EPI, 2019). With this uncertainty in public school districts around the country, particularly in Richmond, schools will need to rely on new teachers more than they already do. For these new provisionally licensed teachers just starting their careers, pandemic-related stress is only compounded by the extra coursework, exams, certifications, and performance evaluations needed to obtain a full license. In Virginia, teacher retention is a prevalent issue as evidenced by unfilled educator positions ballooning from around 400 to over 1,000 in the past decade (Stewart, 2021). According to VDOE workforce data, VCU Metropolitan Education Research Consortium [MERC] schools, a group of Richmond-area school districts that includes Chesterfield, Goochland, Hanover, Henrico, Petersburg, and Richmond retained a 78.98% retention rate in 2018 (Castro et al., 2022). Unlike the surrounding districts however, as a school district with high rates of poverty among school-age children, Richmond tends to have much higher attrition rates, especially among less-experienced teachers (see graph below).

Figure 2: Teacher Exit Rates Relative to Free/Reduced Price Lunch Eligibility (2005-2006 to 2017-2018)

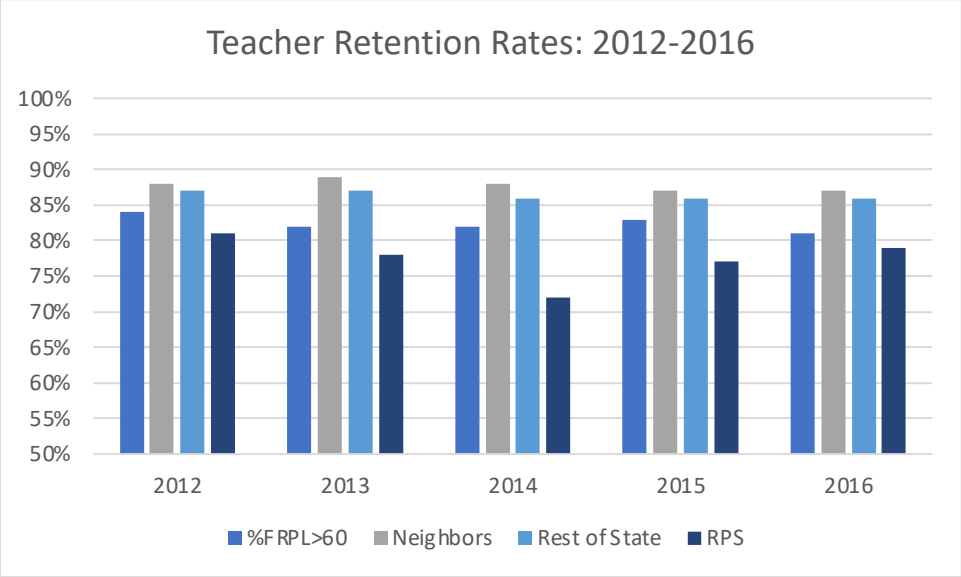


Courtesy: Miller, 2018

Teacher Retention in Richmond Public Schools

Within many of Richmond's schools, high mental and emotional strain placed on new teachers leads to high turnover rates, but then the new, inexperienced replacements also leave creating a revolving door effect. The high teacher turnover in Title I schools only exacerbates the teacher quality issue, and it puts educators further behind as they try to improve the educational outcomes of a particularly vulnerable group. Overall, Turnover rates are 50% higher for teachers in Title I schools; Mathematics and science (high-need areas) teacher turnover rates are nearly 70% greater or alternatively certified teachers are more than 80% higher in Title I schools (Carver-Thomas & Darling-Hammond, 2017). In addition to being far below the national average (13.8% in 2019), RPS Talent Acquisition Director Helen Mickens-DeMena indicated teacher turnover rates currently hover around 15-16% according to in-house data. VDOE reports these to be as high as 21% according to their own business rules regarding teacher qualification (VDOE, 2021). According to data gleaned from RPS, VDOE, and Bellweather Education Partners, teacher retention has generally hovered around 80%, which is well below state average, neighboring localities (Henrico, Chesterfield, Hanover), and even other high FRPL-eligible districts (see graph below).

Figure 3: Comparative Teacher Retention Rates



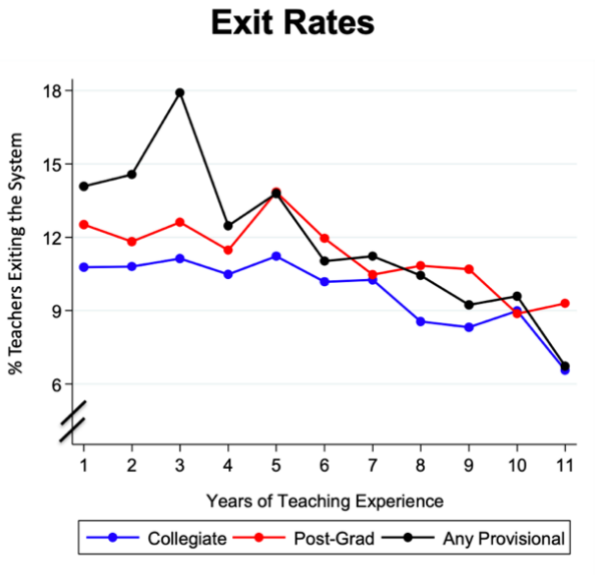
Courtesy: Hudacsko, 2019

Retention Among Provisionally Licensed Teachers

These high turnover rates signal that those provisional employment rates are likely to grow as RPS will need to rely on new and inexperienced teachers to occupy empty positions, which means more burden on Talent Acquisition staff as they recruit more teachers and guide them through licensure. Provisionally licensed teachers are a subset of the educational labor force particularly vulnerable to attrition. According to a long form report on Virginia teacher retention, there was a distinct spike in teacher exit rates after the third year, which is coincidentally when the normal provisional process concludes; provisionally licensed teachers exit the profession at the end of their cycle at a much higher rate (Miller, 2018). Essentially, provisionally licensed teachers have a distinct vulnerability to attrition resulting from difficulties meeting requirements over that three-year period. From personal research, the problems with this process range from unclear expectations to lack of financial/administrative support. These rates largely level out, but that can be attributed to teachers actually finishing their provisionals at the end of their third year.

As mentioned previously, most recent teacher quality data shows that 15% of Richmond teachers are provisionally licensed, which is more than twice the state average of 6.3% (VDOE,2021). This number has slowly climbed over the past few years, but according to RPS Licensure Specialist Taryn Crawley, this number could eclipse 20% over the next few years. The provisional process refers to the three-year period (barring extensions) during which teachers complete required coursework, state exams, in-class instruction, and additional trainings in pursuit of their full licenses (see technical relevance section for further details). Virginia's process is similar to that of other states like Maryland in that they have a tiered licensing system wherein teachers move from provisional to full licenses upon completing the various requirements.

Figure 4: Virginia Teacher Exit Rates, years of experience



Courtesy: Miller, 2018

IV. Client Relevance: Richmond Public Schools

Over the past ten years, RPS has remained well-below state and national average in terms of retaining teachers. As an urban public school district with high rates of poverty among school-age children, Richmond struggles to hire and retain quality teachers at a high rate, and must therefore increasingly rely on new, inexperienced teachers. In recent years, Richmond has become increasingly reliant on provisionally licensed teachers--early career teachers in the process of meeting their certifications (coursework, exams, etc.) to get their full licenses. Variations in teacher quality account for a larger portion of the total variation in student achievement than any other school-based input (Hanushek & Rivkin, 2006). For this reason, improving teacher wellbeing and support is paramount to ensuring their long-term retention while better equipping them to improve student outcomes.

Richmond Public Schools Financial and Demographic Overview

Finances

For the current fiscal year, Richmond Public Schools [RPS] has an operating budget of $347.5 million for its 50 schools and 28,240 K-12 students (RPS, 2021). Under the Virginia Local Composite Index, which dictates that localities handle at least 45% of education expenditures with the Commonwealth taking on the rest, the City of Richmond takes on 53.3% of the operating budget with a $185.3 million share (RPS, 2021). Compared to Virginia's fiscal year 2020 average teacher salary of $60,265, Richmond's average sat at $51,907. This implies that Richmond has difficulty retaining teachers such that they can climb the salary schedule (Appendix). As stated previously, RPS holds about a 17:1 student-faculty ratio and spends $16,598 per pupil which includes $2,400 from federal funds—up from $15,556 (RPS, 2021).[1] In terms of performance, Richmond held an on-time graduation rate of 78.8% in 2020-2021, which

[1] Operations includes regular day school, school food services, summer school, adult education, and other educational programs, but does not include facilities, debt service, and capital outlay.

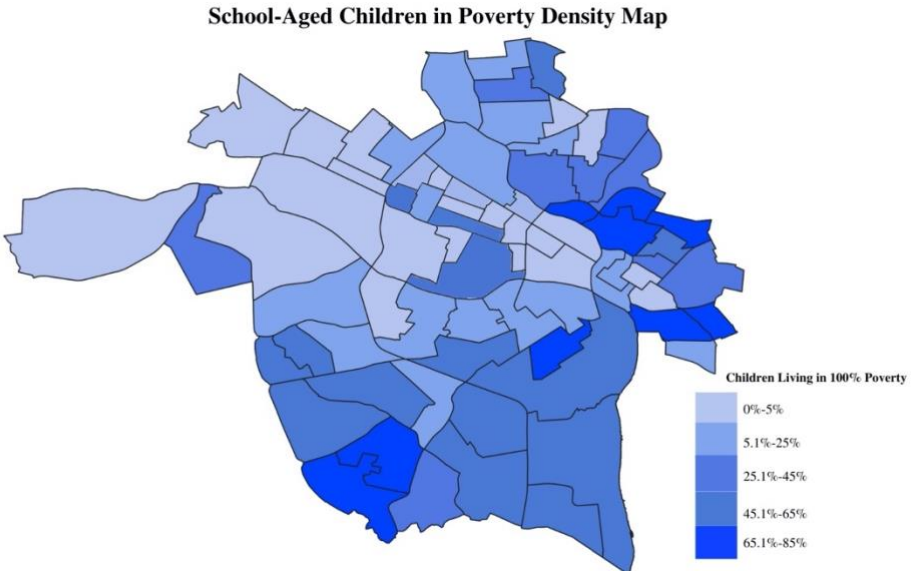
was well below the state average of 93% (VDOE, 2021). Most recent available data (2018-2019) indicates that postsecondary enrollment was also well below the 69% state average at 53% (VDOE, 2021).

Students

The current demographic breakdown for RPS students is as follows: 55.4% Black, 18.5% Hispanic, 21% White, 3.4% Multiple Races, 1.6% Asian, .2% American Indian (VDOE, 2021). Poverty is a prevalent problem in RPS as indicated by 39 of Richmond's 50 public schools qualifying for federal Title I assistance. In addition, parent of children in RPS have a median household income of $28,274, and 42.1% of RPS families receive SNAP benefits (NCES, 2021). For clarification, Title I is federal funding assistance given to schools that meet the 40% threshold for low-income students. For this analysis, low-income students can be defined as those qualifying for free and reduced-price lunch programs [FRPL]; this includes children whose family income is within 130 percent of the federal poverty line. RPS also has high concentrations of people of color as Black and Latino students make up 73.9% of Richmond's entire student population (VDOE, 2020). Focus on improving outcomes for these vulnerable groups is paramount to promoting equity.

Given an overview of RPS demographics and finances, it is important to note how these structures manifest in school policies. 39 out of 50 of RPS K-12 schools are Title I schools, meaning that schools have a high enough proportion of low-income students for the school to qualify for federal funding assistance (VDOE, 2020). To promote nutritional equity among their students, Richmond recently joined the USDA Community Eligibility Program [CEP], which stipulates that if a high enough proportion of students are FRPL-eligible, the entire school or district qualifies. Implementing CEP promotes equity for RPS students, but it also tells a story about the financial state of many families whose children go to school in RPS. Of Richmond's entire student body, 61% of black students and 49% of Latino students attended schools that were at least mid-high poverty as of 2017, or 50-75% FRPL-eligible under pre-CEP apparatuses (NEA, 2017). While all students are now eligible for free lunch under the CEP, students of color continue to encompass a large proportion of high-poverty school populations.

Figure 5: School-Aged Children in Poverty Density Map



V. Problem Persistence and Cost to Society

Specific Sub-Populations & Equity Issues

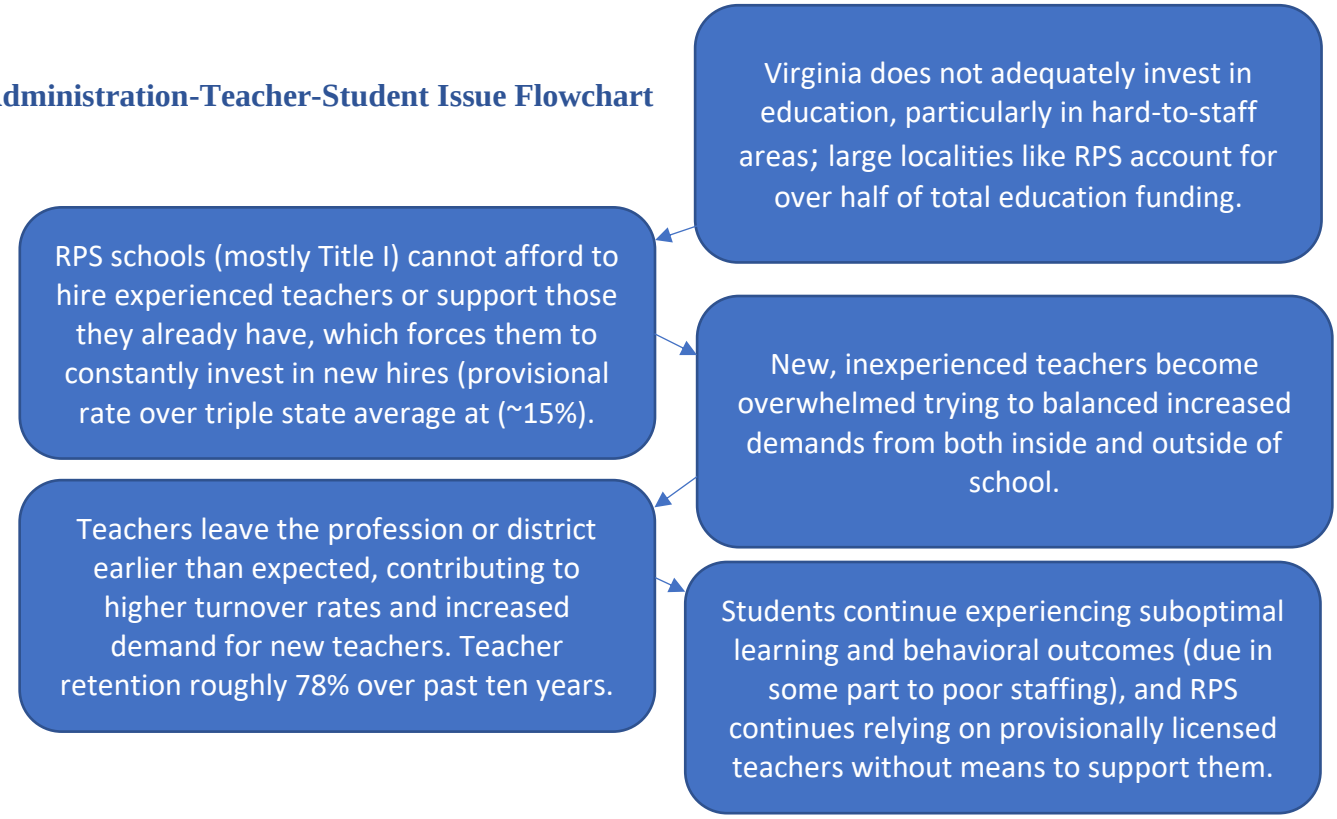
In considering the downstream effects of low teacher retainment and quality, the group most adversely affected are the students themselves, particularly students of color in low-income areas. Students, the population most directly affected by educational policy decisions, are largely dependents in the policy feedback processes, which means they're likely to receive fewer benefits than needed in favor of more influential policy actors (i.e. interest groups, voters, etc.). In looking at children across public schools, children in Title I schools are likely to suffer from lack of quality education (in addition to other constraints); this has long-term implications for student' professional and economic outcomes when considering that teacher quality is ithe single most important in-school factor for student achievement (Hanushek & Rivkin, 2006). As stated previously Black and Latino students are the most likely to be in a school with high poverty rates; they also make up 73.9% of Richmond's entire student population (VDOE, 2020).

Most any policy initiative will center teacher support as a primary driver for improving student outcomes in Richmond. This alternative notably omits direct aid for students and other resource sectors, but as previously mentioned, teacher quality is the single strongest in-school determinant of student achievement. Title I school students, predominantly Black and Latinx in Richmond's case, are victimized by lack of access to experienced, quality teachers, not to mention that these schools lack the capacity to train new ones (NEA, 2019). Teachers are such an integral piece of determining those long-term outcomes, and RPS in its current state is not equipped to fund and support teachers in the interest of long-term success. This is discouraging for prospective teachers hoping to make a difference, but students are the ones paying the ultimate price in the form of lower postsecondary enrollment, lower lifetime wages, and lower life expectancy (NEA, 2019).

Examining the Status Quo

Under current policy, lack of access to quality education is costing students dearly in term of long-term economic wellbeing. A wealth of studies exists on the relationship between educational attainment and employment/income, and as previously stated, teachers are primary drivers for those outcomes (Tamborini et al. 2015). Specifically, new teachers and administrators lack adequate support in navigating the inefficient and burdensome licensure process. As outlined in the previous section, failing to solve the teacher attrition problem creates the following cycle:

Administration-Teacher-Student Issue Flowchart



Within RPS schools, difficult conditions and lack of experience among teachers leads to high turnover rates, but then the new, inexperienced replacements also leave. The high teacher turnover in Title I schools only exacerbates the teacher quality issue and the importance of a high-quality teacher cannot be overstated. This is evidenced by the fact that a student assigned to a very good teacher for a single year may gain up to a full year's worth of additional growth in comparison to a student assigned to a very poor teacher.

Furthermore, having a series of strong or weak teachers in consecutive years compounds the impact of that teacher. Students who fall behind due to poor teaching are less likely to graduate from high school, go to college, or obtain some postgraduate training which can have a strong negative impact on their adult wage earnings and their overall economic stability-- thereby trapping them in the cycle of poverty (Hanushek & Rivkin, 2006). To stop this revolving door effect (also exacerbated by COVID-19), RPS must examine key facets of its teacher recruitment and support system. RPS can also look at improvements to the provisional process as an opportunity to build trust and rapport with new teachers while raising their chances of success.

Estimating Cost to Society

Administrative Costs

First and foremost, hiring, training, and developing new teachers to replace lost teachers costs school districts $15,000-$20,000 depending on size and location. (Darling-Hammond, 2010). In addition, poor teacher retention is particularly harmful for student outcomes in high-poverty schools. Examining the cost of teacher attrition specifically, teacher attrition costs about $2.2 billion per year in administrative costs across the United States (Castro et al., 2018). For this analysis, the estimated cost for replacing a teacher in Richmond, a mid-sized city, will be $18,000. According to most recently available VDOE data, RPS retained 1,292 of their 1,693 teachers in school year 2019-2020, or about a 76.3% retention rate (VDOE, 2021).[2] Assuming a slightly higher retention rate, 80% of 1292, the **estimated yearly administrative costs of teacher attrition is $4.65 million per year**. Granted, VDOE operates under different business rules than RPS, meaning they define teachers differently and therefore record different retention rates.

Costs to Students

In terms of student outcomes, in terms on wages, raising teacher quality one standard deviation in value added can add $250,000 in undiscounted lifetime wages for an average classroom of 28 students (Chetty et al., 2014). Applying this to Richmond, a district of about 27,214 K-12 students (2,093 average graduating class size), **the overall effect of slightly raising teacher quality could raise cumulative lifetime wages for the average graduating class by $18.7 million**. This is particularly insightful in the Richmond context as they disproportionately employ new and inexperienced teachers. In estimating the overall costs of poor teacher retention and quality is currently **costing the city of Richmond $23.35 million across costs and lifetime student wages** for the average graduating class.

Costs to Society

Relative to individuals who complete high school, the average high school dropout costs the economy approximately **$272,000** over his or her lifetime in terms of lower tax contributions, higher reliance on Medicaid and Medicare, higher rates of criminal activity, and higher reliance on welfare (Levin and Belfield 2007). According to the Social Security Administration, after controlling for socioeconomic factors, estimates showed that men and women with bachelor's degrees earn $655,000 and $450,000 more in median lifetime earnings than high school graduates (SSA, 2021). Applying this Richmond during the base year 2018-2019, only 70.8% of 1,212 12th grade students graduated on-time, which translates to **$233,402,112** in total costs over a lifetime. While costs to society are an integral outcome directly affected by teacher retention, they fall outside the scope of this analysis which centers on teacher retention as it impacts RPS as an organization.

[2] Includes retirements, moves to new districts, and leaving the profession.

VI. Governance Overview

Federal Role and Assistance

As mentioned previously, the federal government provides about $2,400 (14.4%) of Richmond's $16,598 per pupil spending total for the current fiscal year (RPS, 2021). RPS is one of five school divisions in the Commonwealth operating under the USDA Community Eligibility Provision (CEP) meaning 100% students receive free meals under the Federal school lunch program—encompassed in per pupil operations expenses. The Special Revenue Fund includes some major grant program funding awards through the Individuals with Disabilities Act [IDEA], Head Start, and Title I that are resourced by the federal government; programs resourced by the Special Revenue Fund are largely formula-driven, meaning they are far less discretionary than the General Fund (RPS, 2021). With the Title I formula remaining largely unchanged since passing with the 1965 Elementary and Secondary Education Act, it is likely that federal funding will continue to hover around the same proportion of total funding. Since 2014, federal per pupil funding has hovered between $2,100 and $2,400 (RPS, 2017; RPS, 2021). Over the next ten years, federal funding and support are likely to remain relatively constant.

Resulting from the COVID-19 Pandemic, the federal government provided $2.1 billion in pandemic relief money to Virginia public schools through the Elementary and Secondary School Emergency Relief [ESSER] fund as part of the American Rescue Plan Act. VDOE will distribute grant funds to school divisions receiving awards on a reimbursement basis. Ninety percent of the award, known as ESSER II, to distinguish the latest aid from allocations under two previous federal relief measures -- went directly to the commonwealth's 132 school divisions (VDOE, 2022). Federal aid has proved a boon to state public school systems as they continue recovering from COVID-19 and indicative of increased focus on resources in public schools.

Role of State Entities

Virginia Department of Education

The Virginia Department of Education is the constitutional body vested with general supervision of the public school system; both the Constitution and the Code of Virginia give the board certain powers and duties (Commonwealth of Virginia, 2022). Under newly elected Governor Glenn Youngkin, Aimee Rogstad Guidera was named Secretary of Education under the new administration in December 2021; this position guides and oversees Virginia's institutions of higher education in addition to the K-12 schools within VDOE's scope. Slightly later, Jillian Balow was named as the new Superintendent of Public Instruction in January 2022--this is the key executive office related to K-12 education. The Virginia General Assembly and Governor's office make ultimate determinations about state-level funding, but each of these figures and their offices are important to articulating educational priorities across the Commonwealth.

Per the VDOE website, their main duties include the following:

- Setting statewide curriculum standards
- Establishing high school graduation requirements
- Determining **qualifications for classroom teachers, principals, and other education personnel**
- Establishing state testing and assessment programs
- Establishing **standards for accreditation of local school divisions and preparation programs for teachers and administrators**

- Implementing the Every Student Succeeds Act (ESSA) and administering federal assistance programs
- Developing rules and regulations for the administration of state programs

Regarding teacher licensure and certification, the VDOE is the singular authority concerned with teacher certification. More specifically, Title 22.1 Chapter 15 of the Virginia Administrative Code authorizes the DOE to prescribe regulations for the licensure of teachers and school personnel. The Board of Education is also required to set criteria for teacher education programs, in cooperation with the State Council of Higher Education; the VDOE provides a list of accredited programs for various certification types. The Board of Education may prescribe forms for teachers' contracts, grievance procedures and, with additional approval, the superintendent may enter into agreements with other states for reciprocal acceptance of educational personnel. Licensure conditions and requirements for prospective teachers are outlined in Chapter 23 of the Virginia Administrative Code (8VAC-20-23-40); the primary tasks assigned to teachers are further outlined in the section below. With the help of licensure specialists and other state and local administrators, the VDOE enforces educational standards and ensures that teachers are properly certified.

Licensure Standards in the Commonwealth of Virginia

"The Virginia Department of Education is committed to ensuring every classroom has a knowledgeable, engaged and supported teacher."—Virginia Department of Education

Virginia's teacher licensure process and requirements are standard in relation to other states as new teachers must complete a variety of exams, accredited courses, in-class teaching experience, and other certifications to obtain their full renewable license. Essentially, any individual with at least a bachelor's degree is eligible to obtain one of six different provisional licenses for a specific endorsement area. Endorsement can include subject areas like Elementary Education K-6, Foreign Languages PreK-12, Career and Technical Education [CTE], Secondary Education (specific subject area), and General/Adapted Special Education among others. Apart from one-year license, provisionally licensed teachers have three years to complete the requirements below, but the COVID-19 pandemic allowed for extension periods of one and two years awarded on an as-needed basis. As noted previously, teacher attrition spikes at the end of the third year for these teachers, which implies that many have problems meeting these requirements in the time allotted. The list below outlines the four primary elements required for provisionally licensed teachers to become fully licensed.

1. **Supervised Classroom Experience**: Student teaching should provide the teacher with no less than 300 of fulltime in-classroom teaching experience at the level of endorsement—at least half of these hours must be supervised.
2. **Professional Studies Requirements**: Teachers must complete a specified number of course hours in various areas depending on the endorsement they are pursuing. A few examples of subject areas include human growth and development, curriculum and instructional procedures, foundations of education, language acquisition and reading, classroom behavior management among others. More specialized endorsements like Special Education [SPED] typically require additional, more specific coursework. These are usually completed through state-approved teacher preparation programs.

3. **State Exams**: Similar to professional studies requirements, the required exams are largely dependent on the endorsement the teacher pursues. Teachers are primarily responsible for completing some combination of the following exams, if not all three:
    - Virginia Communication and Literacy Assessment [VCLA]
    - Praxis Assessment
    - Reading for Virginia Educators [RVE]
4. **Statutory requirements**: Regardless of license status, all teachers must receive and complete child abuse recognition and intervention training, emergency first aid, CPR, and AED training, and dyslexia awareness.

Problems with Education Funding Structures in the Commonwealth of Virginia

As currently structured, the Commonwealth of Virginia's formula for education funding exacerbates inequality and creates resource disparities for high-poverty districts. Virginia places a relatively high burden out of all states on localities to pay for K-12 costs, and the local share is primarily funded through property taxes (Jones and Stewart, 2021). This means that districts with high poverty rates, which tend to need more resources, have less financial flexibility to invest in their schools. In fact, a 2018 study showed that Virginia school divisions serving the lowest share of students in poverty had 7 percent more total state and local funding per pupil than divisions serving the highest share of students in poverty (Morgan and Amerikaner, 2018). Despite Virginia having a median household income of $76,456, top 10 in the nation, the state currently ranked 41st for state K-12 per-pupil funding (Jones & Stewart, 2021). An inequitable funding system is consequential to divisions like Richmond as they struggle to hire and retain quality teachers

State funding and sales taxes only cover $6,099 (36.7%) of the Richmond's $16,598 average per pupil operations expenditures. State per-pupil spending is distributed based on a formula known as the Local Composite Index (see Appendix), which determines what share of the costs will be paid by the state and what share must be covered by the local government (Jones & Stewart, 2021). In terms of state funding, Virginia has yet to recover from the cuts to K-12 education brought on by the 2008 financial crisis; still down 9.1% in real dollars compared to pre-Great Recession levels (Cassidy & Duncombe, 2018). As stated previously, localities are mandated to cover at least 45% of expenditures, but often end up paying more than half. Per the VDOE, determines a school division's ability to pay education costs fundamental to the commonwealth's Standards of Quality (SOQ); a locality's index is determined by three weighted factors:

- 50%: True value of real property ($29.5 million)
- 40%: Adjusted gross income ($7.7 million)
- 10%: Taxable retail sales ($2.8 million)
- Richmond Ability to Pay Rating (2022-2024): .52

As mentioned previously, the City of Richmond takes on more than half of the RPS total operating budget (53.3%), and exactly half per pupil operations (50%). While Richmond has steadily increased its per pupil funding from $5,996 to $8,099 since 2014 (+35.1%), state funding has only increased from $4,200 to $5,005 (RPS, 2017; RPS, 2021). State-level funding structures will likely need to change to help localities combat teacher attrition. According to the Urban Institute, improving equity regarding state sales tax revenue earmarked for education

more progressively or incorporating population prosperity measures into the composite index could result in large changes in equity without increasing state funding (Lou & Bragg, 2018).

High poverty rates in schools are often an indicator for the experience and quality of teachers within them due to specific policies. Broadly, one of the key causes for high teacher attrition in RPS is poor investment on the state's part; the State of Virginia has not invested adequate resources in teachers or administrative process conducive to teacher retention and success in its high-minority, high-poverty areas. Title I schools exist in areas of more concentrated economic disadvantage and because schools are funded primarily through local property taxes, lower property values lead to an overall smaller portion of money for the school (Turner et al. 2016). This also means there is less money to specifically dedicate to teacher salaries. Teacher salaries are based solely on the number of years a teacher has been in the profession and their level of accreditation, so Title I schools with smaller budgets often have to hire newer and less credentialed teachers (Adamson & Darling-Hammond, 2012). Furthermore, working conditions in Title I schools are often worse than in schools with more funding and resources and this leads to higher teacher attrition (AEE, 2014). The compounding effects of poor working conditions, lack of investment, and weak support systems all contribute to Richmond's teacher retention problem.

City of Richmond

Each year, Richmond's Mayor proposes their annual budget for the city council's approval, which includes the appropriation for Richmond Public Schools. For reference, the city is currently under the leadership of Mayor Levar Stoney (Democrat, assumed office 2017). The RPS budget is devised in accordance with both the Mayor's official priorities, city council focus areas, and the educational needs outlined by the RPS strategic plan. RPS is one of the city's seven major budget categories and accounts for just about a quarter of the total expenditures in Richmond's current fiscal year budget.

As mentioned previously, Richmond is under growing pressure to fund their own public schools as state assistance continues to stagnate. Since 2009, state funding for K-12 education is down 9%, while overall student population has grown by 53,000 students and staffing shrunk by nearly 1,300 positions (Carrington, 2018). Current funding structures have led to a steady increase in the city appropriation for RPS, which has gone from $159 million in 2017-2018 to $185.3 for the current fiscal year—up 16.5% (RPS, 2022). There is an obvious tension between the state and localities regarding educational funding as many of Virginia's mayors and administrators have advocated for changes to current funding systems as seen in the 2018 March for More demonstrations (Carrington, 2018). Even more so than the state, the City of Richmond is the entity most important to determining resource distribution for RPS.

Richmond Public Schools

Richmond Public Schools [RPS] has an expenditure budget of $347.5 million for its 54 schools and 28,240 students. Regarding student experiences, RPS holds about a 17:1 student-faculty ratio and spends $16,598 per pupil (VDOE, 2021). RPS current strategic plan, Dreams4RPS, includes ten long-term goals related to student achievement and wellbeing, equity, funding, and teacher satisfaction and retention which cover 2018-2023 (RPS, 2018). Current RPS Superintendent Jason Kamras and the Richmond School Board has centered equity and advocated for policies to eliminate the "opportunity gap" that disadvantages many low-income children and children of color, and he has led efforts to dismantle institutionalized racism in

public schools (RPS, 2022). Superintendent Kamras and RPS leadership is extremely influential in determining the overarching objectives for RPS while advocating for support in achieving them. In 2018, Kamras joined Mayor Stoney in the March for More campaign to increase state funding for public schools. There is an ongoing standoff between the Richmond School Board/Mayor's Office and the City Council regarding the reconstruction of George Wythe High School (Suarez, 2022).

Richmond Education Association

In December 2021, Richmond became the first school district to grant collective bargaining rights to its employees (Hammond, 2022). While still in its infancy, the Richmond Education Association [REA] is likely to be an extremely influential part of RPS decision-making as membership grows. Beyond Richmond, unions holds the power to collectively act on behalf of teacher interests across Virginia as exhibited by the Virginia Education Association's resistance to Governor Youngkin's ongoing efforts to omit divisive subject matter from school curriculums (Graff, 2022). Per their mission statement, the REA is "a union of education workers dedicated to defending and transforming public education for all by improving teaching and learning conditions and protecting the rights of our members" (REA, 2022). With a union now backing teachers' interests, working conditions and support are likely to become even more pertinent.

VII. Evidence on Potential Solutions

"Every child deserves to have a highly qualified teacher from the start of the school year until the end of the year. Our goal is twofold: fill every teacher vacancy with a well-compensated and talented teacher who leads their classrooms with love while holding students to high expectations and fully support every staff member during their tenure at RPS, from the hiring process through retirement."—Dreams4RPS Priority 2

Exploring Evidence Related to Teacher Retention Efforts

This section expands on the important aspects related to teacher retention outlined in previous sections. In examining steps to improve working conditions for new, provisionally licensed teachers, this analysis identifies three key focus areas to be addressed in policy initiatives:

1. *Reduce the number of qualified teachers that exit RPS each year*
2. *Improve recruitment of qualified teachers to RPS*
3. *Accelerate and elucidate the qualification process for provisionally licensed teachers*

Related to improvement in these three focus areas are several issues including mitigating administrative burdens, stronger top-down support systems, bolstered mentoring/professional development programs, and teacher salaries and the wage gap. Specific policy alternatives relating to each of these focus areas will be implemented at the local level by Richmond Public Schools upon approval.

Transparent and efficient licensing system with proper staffing (Focus Area 3)

This policy alternative is not well-covered by academic research, probably due to it being more clerical, but RPS provisional teachers have cited the licensure process's many

inefficiencies as a source of stress. Inefficiency in the licensure process, itself, is one of the main problems plaguing the Talent Acquisition Office. Automation has been utilized to great effect in improving efficiency for the American workplace, but VDOE has yet to employ these systems in their more onerous administrative processes. For example, all relevant documentation for licensure is still sent through the mail with no means for teachers to conveniently verify submission. Other state programs, including welfare programs, have moved many of their application and monitoring processes online, though not without some user experience issues (Gaudet & Wagner, 2020). A growing body of research suggests automation's value in expediting admissions processes and library services within higher education (Downey, 2012). With proper user experience and design, automation could prove effective within the RPS licensure process as well.

According to RPS licensure personnel, there currently exists an administrative backlog of over 5,000 license applications at the VDOE resulting outdated infrastructure. Simply put, Virginia is behind other states that have completely moved their licensure processes online including Ohio, Colorado, New York, Nevada, and Louisiana; all these states allow for documents to be submitted online while offering helpful information and resources for teachers to use. Virginia adopting a similar platform would eliminate costs and save labor hours for teachers, human resources personnel, and state education officials. One notable example of automation to make licensure more efficient for teachers and administrators is newly implemented Colorado's Online Licensure and Submission System (COOL). Launched in spring 2021, this system allows teachers to submit paperwork and track progress entirely online; it also adds features like browsing proper educator preparation programs (CDOE, 2021). Evaluating this platform's long-term efficacy is difficult, but the program answers many of the questions/addresses problems currently handled by Virginia's overworked and understaffed talent acquisition departments.

Another example is the North Carolina Department of Instructions platform, which automates the collection of the license application, supporting documentation, and payment, which eliminates the time-consuming, manual process that has been in place (ranges from approximately 16 to 35 business days) (Grovenstein, 2015). Seeing as teachers complete many similar requirements (exams, coursework, certifications, etc.) from state-to-state, this is an easily replicable and externally valid policy option that VDOE could draw inspiration from other states if implemented. Easily navigable interfaces, certification/submission options, and increased resources all imply positive impacts, but there exists no analysis that narrows savings on administrative costs down to a dollar amount. However, in states trying to implement a work requirement for Medicaid, fixed costs associated with information technology [IT] upgrades and staffing for use in reporting and monitoring generally ranged between $5 and $15 million (GAO, 2019). This should be a comparable cost estimate assuming the prospective RPS system would largely serve the same purpose (storing/organizing information and tracking progress).

In the RPS talent office, specifically, more personnel are likely needed to work with the growing number of new teachers During this time, new teachers must devote lots of personal time and financial resources to their work—often at the expense of their families. Richmond's reliance on provisional teachers accentuates the importance of properly equipping both teachers the Talent Office with proper resources, staffing, and support. As currently constructed, one licensure specialist oversees 50 schools, or roughly 300 provisionally licensed teachers. Through extensive work with Ms. Crawley during my summer internship, it became abundantly clear that her department suffers from lack of staffing and resources. This lack of staffing and resources

has a cascading effect that only worsens conditions for provisionally licensed teachers. While RPS lacks the authority to implement a statewide licensure system, better staffing in resources in the talent acquisition office would undoubtedly help with current problems in the licensure process.

Aspects of Teacher-Administration Relations (Focus Areas 1 and 2)

Perception of school and district administration is one of the single strongest influencers of a teachers' decision to stay or leave the profession, particularly early in their career and in urban, low-income schools (Boyd et al., 2011). One aspect to note is the difference in available research school or district level; in-school dynamics, such as those between teachers and principals, are much more well-covered in research. On the other hand, studying specific teacher-administration dynamics at the district level is a relatively new avenue of academic research, but could be a primary focus potential for future policy changes (Adams, 2020). A 2013 study conducted on 79 Mississippi public schools found that of the following variables--administrator leadership style, induction mentoring programs, teacher isolation, professional development/support, incentives offered, and the teacher-administrator administrator relations—administrator leadership style had the greatest impact of all the independent variables (Gray, 2013). In conversations with Maryland and Virginia teachers, members of both groups stated that "overbearing" administrative standards seriously harmed their job satisfaction. VCU MERC recently published a compelling report that examines principals as important agents in teacher retention using five focus areas: shared vision, relational trust, shared instructional leadership, safe working conditions, and bureaucratic shield (Becker & Grob, 2021). RPS can employ similar strategies to promote equity and synergy between administration and teachers.

One study conducted among teachers and principals in North Carolina found that mutual understanding on matters of race and gender are both profoundly important to establishing trust between the two parties, which is an important consideration for this alternative going forward (Brezicha & Fuller, 2019). Working conditions, which can be defined as relationships and support from school leadership, professional development opportunities, and mentoring support all have significant positive impacts on reducing teacher attrition (Geiger & Pivovarova, 2018). In addition, another study found that the administrator-teacher relationship may depend upon the performance level of the school based on state and/or federal accountability standards (Gray, 2013). As delineated previously, Richmond performs poorly in several key performance measures, which likely contributes to tension between faculty and administration.

More specifically, a growing body of research shows that, in addition to the many other reforms taking place in public education, that building teacher-principal relationships is key to school improvement efforts (Daly & Finnigan, 2012). Conversely, in a study conducted on New York Public schools, a much larger district but with similar demographic breakdowns to Richmond, dissatisfaction with school-level administration was found to be the most significant driver of teacher dissatisfaction and attrition (Boyd et al., 2011). The importance of strong teacher-principal dynamics is well-documented, but districts also have a role to play in articulating a vision and strategy for their teachers; this can include promoting equity, establishing coherence, and generating collective will within schools (Geiger & Pivovarova, 2018). From personal correspondence during my work with RPS, teachers desire more professional development opportunities, support and feedback, and personal correspondence with both principals and district higher-ups (i.e. mutual respect).

Teacher-principal dynamics are much more well-covered in research than teacher-district level, but research gathered on both fronts has yielded insight valuable to the Richmond context. If teacher retention is the primary goal, Richmond should be examining administrative support at both the school and district to do so. The literature does very well to cover the importance of relationships between in-school actors (teachers and principals), which is essentially that building these relationships is integral to creating trust and ultimately retention. However, research assessing the dynamics and overall importance of school and district administration levels remains less well-covered.

Mentorship/Induction Programs and Channels for Teacher Feedback (Focus Areas 1, 2, and 3)

This option likely involves a building cohort system that matches new teachers with experienced teachers on similar endorsements to learn their specific subject area's teaching approach, licensure requirements, and general best practices. Overall, participation in mentoring/induction programs help with teacher retention, and this effect is especially strong when teachers are matched by subject (Ingersoll, 2012). One comprehensive study of teacher mentorship programs found that teacher mentorship programs with more supports have strong positive effects on student achievement, usually after three years, and particularly for teacher retention among newer teachers; however, this effect did not extend to teachers in large, urban, low-income schools (Ingersoll & Strong, 2011; Glazerman et al., 2010). While a mentorship program might help teachers be better instructors, marginally increasing achievement levels may not necessarily translate to teachers wanting to stay in a more difficult school environment—this research looked at teaching more generally.

In another study that assigned increased support to a treatment group of teachers, the support was widely utilized, but there remained no significant difference between treatment and control groups in terms of retention (Glazerman, et al., 2010). Also, worth noting here is that mentorship programs can take at least three years before there is notable positive impact on student achievement. The results found in these surveys contrast with Virginia's requirements for teacher mentor programs in hard-to-staff schools, which posits that districts with effective support promote teacher retention and student academic performance—only the latter has been empirically proven since that report was released (VDOE, 2004). For crafting an effective program, however, more recent literature finds that teachers generally value these programs especially when they include multiple feedback sources (including students), and more experienced teachers felt they gained the most (Keiler et al., 2020; Lynn and Nguyen, 2021). These evaluations of mentorship programs are strong in their sampling and methodologies, but not all account for urban, high-poverty contexts.

Overall, though effective teacher mentorship yields benefit in terms student achievement and teacher retention, though not necessarily in urban, high-poverty contexts. Based on the literature, there is no clear consensus on the effect of these induction and mentoring programs on teacher retention, specifically. In addition, results in even the most effective programs, results can take three years or longer to materialize. For the purposes of improving the licensure process, it may be more useful to examine other teacher working conditions and administrative processes and support as a means of improving retention among newer teachers.

Addressing Costs to Entry and Teacher Wage Gap (Focus Areas 1, 2, and 3)

This focus area involves improving teacher wellbeing through financial support while increasing Richmond's desirability as a professional destination for teachers. In personal

correspondence with provisional teachers, they cited lack of financial support to deal with student loans, testing fees, and other financial duties as key stressors. As currently organized, due to lack of educational attainment and professional development, provisional teachers start on the lower end of the RPS Salary Schedule—around $50,000 (RPS, 2021). Under increased the financial stress associated with licensure (courses, tests, etc.), lower salaries harm teachers' ability to support themselves. Various economic incentive policies at the federal level such as service scholarship and loan forgiveness programs encourage teachers to teach in schools with staffing and retention challenges—these could be extremely useful in Richmond. These sorts of programs provide the financial incentive for teachers to continue teaching, and they draw prospective teachers into the workforce through high-quality preparation programs associated with greater teacher retention, especially in both subject and geographical areas with high turnover (Carver-Thomas & Darling-Hammond, 2019).

In Virginia, teachers make considerably less than other working adults with similar education and experience as exhibited by the 32.7% teacher wage penalty--first in the nation (Allegretto & Mishel, 2019). RPS understands these improvements' importance as the $347 million 2021-2022 operating budget approved earlier this year includes 3% raises for all staff, 1.17% living cost salary increases, more staff to combat COVID-related staff losses, and a $6 million capital improvement plan for school buildings and other facilities (RPS, 2021). However, RPS teacher salaries remain below the $60,000 state average.

According to a nationwide March 2021 survey of nearly 700 teachers conducted by the EdWeek Research Center, 57 percent of respondents indicated that a salary hike would make a major difference in reducing their likelihood of leaving the K-12 teaching profession in the next two years. In addition, there exists a host of research that documents poor pay as a main reason why teachers leave (especially in urban areas), as well as an inverse relationship between teacher turnover and scheduled pay rises (Finster, 2015; Milanowksi & Odden, 2007) With so many teachers leaving due to poor working conditions further exacerbated by COVID, increasing pay may prove to be a simple but substantial solution that attracts new teachers to consider Richmond as a destination. Less consequential financial incentives could include cash payments, loan forgiveness, and cost reimbursements, some of which is offered by RPS on a limited basis.

Evidence Takeaways

These possible alternatives address just a few of the myriad issues associated with provisional licensure and new teachers, as well as the teaching profession overall. Some key insights are that working conditions like teacher-administrator relations and support might be a more promising avenue for increasing teacher retention than mentor programs based on relevant research. However, a mentorship program with proper matching, support and feedback mechanisms could help build evidence to support their efficacy. One of the most promising avenues for policy alternatives is likely bolstering teacher pay structures, increasing financial incentives in high-need areas/schools, and introducing greater financial supports for newer teachers. Mentorship programs, when rigorous enough and supplemented by increased administrative support, have the potential to create more favorable outcomes for students and teachers, alike. However, mentorship programs tend to show effects in the long-term, which might make them less appealing in ongoing efforts to approve the licensure process. Concerning online licensure platforms, the literature is sparse outside of the platforms, themselves, but there exists plenty of evidence on the efficacy of automation and online services in other policy areas and professional settings.

VIII. Core Evaluative Criteria

Policy initiatives will be evaluated in relation to the following criteria. Due to the difficult circumstances RPS contends with—resource constraints, increased student needs, administrative burden, and financial pressure among others—each criteria is weighted equally when considering final recommendations.

Criterion 1: Political Feasibility

Using relevant metrics like press releases and previous policy decisions, this criterion measures a policy's likelihood of passing through the Richmond Mayor's Office and City Council, being adopted by the City of Richmond, and ultimately implemented within Richmond Public Schools. Policy alternatives will be ranked based on the total political cooperation necessary from both city and RPS officials. Expensive policies that seriously alter funding structures or allocations will be more difficult to reach full implementation. Conversely, highly feasible policies are likely to win support from the mayor, city council, school board, Richmond community, and other relevant entities.

Worth noting is that these policy alternatives focus on Richmond, a city and school board that is mostly homogenous politically and likely more receptive to Richmonders' interests. For that reason, these Richmond-focused policies are inherently more palatable than those focused on the state level. With Virginia's legislative and executive branches being led by two different parties, sweeping state-level policies adopted will inherently have lower political feasibility than those at the district level. In addition, large-scale changes to entrenched tax codes and funding structures are unlikely to be adopted regardless of party control. Conversely, public education is likely to become a more pressing issue as the teacher labor market continues to struggle, which may warrant substantial changes to current policy.

Criterion 2: Implementation & Administrative Feasibility

This criterion examines the capability of Richmond Public Schools (at the administrative and classroom levels) to successfully implement new policy changes or program initiatives throughout relevant. Important metrics to this criterion include required training, staff buy-in, and existing systems. The more far-reaching and complex that policy changes are, the lower they rank. These alternatives based at the district level have inherently higher implementation potential under this criterion as they would not require cooperation between localities and state entities. Similarly, policies that involve operational changes to multiple agencies will be more difficult to implement. Finally, the timeframe necessary for a policy to fully take effect (i.e. a phase-in period) will also be considered in implementation. Timeline is important in relation the Dreams4RPS goal of reaching 85% teacher retention by 2023. High ranking in this criterion requires lower administrative barriers, high buy-in from staff

Criterion 3: Equity

This criterion examines whether a policy corrects resource disparities for students and staff negatively impacted by them, in particular for inexperienced teachers (i.e. students and staff in high-poverty schools). With this policy project primarily focusing on high-need, high-poverty schools that predominantly serve students of color, the degree to which policies do so is the primary measure. High-ranking policies will have tangible impacts on student-teacher dynamics, the classroom environment, and the overall wellbeing of Richmond Public Schools. In this case,

the outcome objective is raising the number of quality teachers hired and retained by RPS. Teacher quality and retention is normally an input that would manifest in outcomes like on-time graduation or math proficiency. In this case, since teacher retention is such a prevalent issue (and important to those outcomes mentioned), policies will be evaluated based on their ability to help teachers join and stay in the RPS workforce.

Alternative policies will be evaluated in relation to their likelihood of achieving Dreams4RPS 2018-2023 target, which is to have an 85% teacher retention rate by the end of 2022-2023; this figure aligns RPS with the current state average for retention and surpasses that of other divisions with high numbers of Economically Disadvantaged students.

Criterion 4: Cost-effectiveness Analysis

This criterion measures the efficiency of a policy alternative between outcome and required costs; a ratio of the policy's net discounted cost weighed against the total outcomes a policy creates for Richmond and its public schools in the long run (compared to status quo). This applied policy project includes a full cost-effectiveness analysis (CEA) on each policy alternative**.** This CEA measures the value (in dollars) of resources spent relative to effectiveness at achieving progress on a specific objective for Richmond Public Schools, which for this analysis is **total certified teachers retained** as influenced by the four policy alternatives compared to status quo policy over a **ten-year time horizon**. For reference, retaining status quo policy structures bears a cost effectiveness ratio of **.250**. Cost effectiveness is normally the central criterion for evaluating policy, but since the CE ratios of this project's policies are so similar, cost effectiveness is weighted equally with the other criteria.

The CEA covers the ten-year projection period out from base year (2018-2019) through the policy's full implementation to analyze policies' net effect—this is especially important if a policy includes a phase-in period. Unlike the previous measures, this criterion will assign a monetary value to the costs rather than a scaled rating. A lower ratio indicates that a policy is more effective in relation to the total resources expended. Further explanation of the CEA can be found in the Appendix.

Cost-effectiveness Methodology

CE Equation

$$\frac{\text{Total RPS Expenditures (Status Quo) + New Program Costs}}{\text{Total Additional Teachers Retained over Projection}} = \text{Cost-Effectiveness Ratio}$$

Defining Baseline Estimates

Using RPS budget data from 2008-2009 to 2018-2019, and assuming no changes to the state of Virginia's current education funding formula, total spending for Richmond Public Schools is projected to grow over 2% per year over the time horizon. Since budget data is available up to the current fiscal year (FY22), this growth rate will be applied to next year.

For 2018-2019, Richmond Public Schools had a total operating expenditure of $300.9 million according to the adopted budget, which is aggregated across the following categories:

- Personnel Services ($159.2 million)
- Other Compensation [bonuses and incentives] ($7.3 million)
- Employee Benefits ($75.3 million)
- Purchased Services ($19.7 million)
- Other Charges ($14.3 million)
- Supplies and Materials ($11.2 million)
- Other Operating Expense ($3.9 million)
- Capital Outlay ($2.2 million)
- Other Uses ($7.3 million)

To obtain a final cost-effectiveness ratio, the outcome (number of yearly qualified teachers in RPS over policy period) is divided into the net-present value [NPV] of each policy. The NPV essentially represents the total policy costs given a yearly discount rate of 3% (RPS expenditure + cost of new policies / teachers retained). Dividing the NPV by the total teachers retained yield a final ratio; lower ratios indicate lower cost of retaining additional teachers.

IX. Policy Alternatives

Teacher Retention Under Status Quo

Over the past few years, RPS has made great strides to improve data-gathering capabilities, which is profoundly useful in identifying and addressing problems within the school system. Additionally, RPS also works to build relationships among relevant stakeholders including, administration, school leadership, teachers, and the community. However, without substantial changes to funding and support structures, RPS will continue struggling to retain teachers and relying on new and inexperienced teachers without the means to support them. This issue is just one of many systemic issues that students in under-resourced schools contend with, as mentioned above. Richmond schools largely lack the sufficient funding needed to competitively pay more experienced teachers, which creates a concentration of inexperienced teachers in Richmond's highest-poverty schools. Because teacher quality is directly related to a student's outcomes later in life, it is necessary to analyze the impact of policies that invest resources into teachers.

Baseline Outcome Estimate

This analysis assumes difficulty with teacher from 2019-2020 to 2022-2023 (75%) because of the COVID-19 pandemic before stabilizing around 78% in subsequent years—the average pre-pandemic retention rate from 2012-2013 to base year. This follows a similar trajectory to the period leading up to the base year during which RPS also struggled due to the 2008-2009 financial crisis. With teacher retention rates averaging around 78% in the years prior to the base year, this will be the base rate as COVID-19 subsides. The proportion of provisionally licensed teachers is likely to climb as high as 20% before stabilizing at 15% near the end of the time horizon. RPS generally hovers between 1,600-1,700 teachers at the beginning of an academic year, which assumes about 350-400 hires for vacancies from the end of the previous year. As retention rates grow, fewer vacancies are filled each year. Yearly hiring estimates for teachers are meant to reflect Richmond's 17:1 student-teacher ratio in relation to RPS total enrollment projections from their 2018 demographic study (RPS, 2018). Note that these projections have RPS enrollment growing quickly until 2023-2024 before leveling off. For a school district with the size and student body of Richmond, filling vacancies is assumed to cost around $18,000 per teacher.

Policy Alternative Assumptions

- All RPS policy alternatives will be funded by the city of Richmond due to largely static state and federal funding structures. Any costs to Richmond likely raise their local appropriation, and by extension their share of total expenditures in relation to state and federal funding.
- Alternatives that directly target teacher compensation are more effective at promoting teacher retention than administrative or organizational improvements, but these initiatives also levy higher costs on Richmond.
- As teacher retention rates rise, the proportion of teachers on provisional licenses reduce resulting from decreased need to fill positions.

Policy Alternative Evaluation Matrix

Criteria	Alt. 1: Licensure Coordinators	Alt. 2: Financial Incentives	Alt. 3: Compress Salary Schedule	Alt. 4: Professional Development Fund
Political Feasibility (25%)	3	1	4	2
Administration (25%)	1	2	4	3
Equity (25%)	3	2	1	4
Cost-Effectiveness (25%)	2 (.246)	3 (.250)	1 (.243)	4 (.251)
Weighted Average Ranking	**2.25**	**2**	**2.5**	**2.75**

Note: Alternatives are ordinally ranked 1-4 based on their hypothetical performance within each criteria's specified metrics. A policy ranked first (1) is the best in that category.

Alternative 1: Hire licensure coordinator/career counselors to oversee each of Richmond Public Schools' nine districts

This alternative involves training nine new personnel as licensure consultants and career counselors to act as liaisons and professional resources across Richmond Public Schools' nine districts. These new hires will report directly to Richmond's two licensure specialists about their teacher portfolio; meetings and reports will explore their findings. Richmond's two licensure specialists would train these new personnel to be familiar with the licensure process over Summer 2022 during which the two licensure specialists training them receive $5,000 in additional compensation for the summer. The nine employees will make three months' salary and start full-time for the 2022-2023 academic year.

This alternative aligns most closely with **Dreams4RPS Priority 2 Action 1** (Top Talent), which is redesigning the human resources department to ensure that: (1) RPS is able to fill every vacancy with a highly skilled professional; and (2) both employees and applicants receive outstanding customer service. The RPS Talent Acquisition Office is instrumental in helping teachers manage the demanding licensure process, but as currently constructed, it lacks the human and technological capacity necessary to be effective.

Effect on outcome: During a 2009 study that explored the relationship between school contextual factors and teacher retention decisions in New York City on a sample of about 2,000 current and former teachers, over 40% cited support from administrators as the single most important aspect regarding their decision to stay or leave (Boyd et al., 2021). Similarly, the VCU MERC found workplace conditions positively associated with teacher retention include school culture, collegial relationships, providing teachers with greater autonomy or decision-making power, consistent instructional leadership, professional development opportunities, time

for collaboration and planning, and strong administrative support (2021). RPS placing personnel in schools familiar with licensure policies that can also act as a mediator between teachers, administration, and RPS would likely improve organizational health within schools.

Political Feasibility (3):
With substantial research emphasizing the efficacy of strong administrative support for public school teachers, this additional staffing indicates Richmond's attentiveness to their needs, especially as the teacher labor force continues to navigate COVID-19. Considering the city council's willingness to accept a larger budget and the ongoing improvements to the Talent Acquisition Office, the City of Richmond is likely willing to take on these new salaries in pursuit of RPS strategic goals. This alternative does not appear directly consequential to teacher working conditions, which renders it less politically feasible to city officials.

Implementation/Administrative Feasibility (1):
While the net effect on teacher retention is unclear, this new staff helps RPS better support teachers and administrators by staffing a high-need area. The Talent Acquisition Office, especially licensure personnel, would need to devise plans and objectives for each new counselor's school portfolio, but at peak efficiency this is the most efficient policy alternative.

Equity (3):
These new personnel bolster administrative support to all RPS teachers, but particularly as it relates to the licensure process. With two licensure specialists currently overseeing the roughly 300 teachers on provisionals, both parties are frustrated by the administrative burden resulting from inadequate staffing. This adjustment does not directly target teacher working conditions or compensation, but significantly improves administrative capabilities to give teachers and RPS administrators more resources—especially in licensure.

Cost-Effectiveness Ratio (2): .246
This alternative assumes downstream effects that significantly improve full licensing for provisional teachers, a vulnerable subset of Virginia teachers, thanks to a greater top-to-bottom support system. This alternative creates better retention and more teachers completing their licenses, and though it has a higher total cost than the second and fourth alternatives, it possesses a better CE ratio.

Alternative 2: Targeted financial incentives for teachers in high-needs schools ($1,000 per year) with $500-$750 phase-in period

After a phase-in period of two years, this policy alternative awards $1,000 in bonuses to Richmond school teachers teaching in Title I federal assistance-eligible schools upon completing each academic year signing and signing their contract for the following year. Economic incentives such as increasing the state minimum salary and providing tuition assistance represent additional policies adopted at the state-level to increase recruitment into the teaching profession, especially for teachers in harder to staff fields like STEM, special education, or language courses. Other divisions in Virginia have also experimented with similar targeted financial incentives to address retention by offering "creative compensation," which provides stipends and additional salary enhancements to improve teachers' overall base

salary (VCU MERC, 2021). In essence, this incentive is a pay bump for teachers remaining in RPS that has a larger positive effect on Title I teachers lower on the salary scale.

This policy helps to achieve **Dreams4RPS Priority 2 Action 8 (RVA Incentives)**: Collaborate with the City of Richmond and the Commonwealth of Virginia to implement incentives for top educators to come to, and stay in, RVA, including housing credits, tax credits, and **tuition reimbursement.**

Effect on outcome: Teachers tend to show very positive responses to financial incentives. In one program, North Carolina offered secondary math, science and special education teachers an $1,800 bonus to remain in schools with large percentages of poor or low-achieving students. Researchers found this incentive reduced attrition by an average of 17 percent (Clotfelter, Glennie, Ladd, & Vigdor, 2008). Other research shoes that direct payments can actually prove more cost-effective than loan forgiveness, which is very important to this analysis (Feng & Sass, 2018). Since this incentive program is broader in scope (all Title I teachers), the amount paid per teacher must be pared down.

Political Feasibility (1): With proven results in schools of similar makeup, this modest pay incentive represents a critical step towards achieving two Dreams4RPS action items (2.3 and 2.8, see Appendix). Politically, this alternative is easiest to grasp; pay teachers for their service in high-needs schools. This pay bump also follows the upward trend of teacher salaries over the past few years. Due mostly to its simplicity, this alternative is the most politically feasible.

Administrative Feasibility (2): The only real differences in operating procedures are promotion from the Talent Acquisition Office and the Operating Office doling out bonuses and accounting for the yearly expenditure. In terms of buy-in from relevant offices, this change does not require adjustments from many offices, and there is only one eligibility requirement for teachers hoping to get the bonus. Low barriers to entry and ease of implementation make this alternative very feasible in this criterion, but it is not a direct improvement to administration.

Equity (2): This program targets both new and experienced teachers across Richmond, but has a larger net effect for new teachers due to their place in the salary schedule. As a direct incentive that increasingly helps teachers with lower salaries (i.e. newer teachers), this ranks higher than Alternative 4 (professional development fund) as the literature shows a teacher slight preference for direct cash payments. These two alternatives are almost interchangeable with regard to equity.

Cost-Effectiveness Ratio (3): .250
In relation to the status quo, this alternative bears the same CE ratio while retaining an additional 500 teachers over the policy projection period (compared to status quo). Considering the administrative costs associated with replacing teachers and costs of lower teacher quality, RPS can retain more teachers while bearing roughly the same cost—the key difference is the additional teachers retained thanks to the yearly bonuses. This policy may be less effective than the first alternative, but it is also less expensive. Additionally, this policy is still just as cost effective as the status quo.

Alternative 3: Condense salary schedule from 45 to 30 years while retaining top salary rate

Using the current pay schedule, which took effect in September 2021, this alternative involves condensing the RPS salary schedule from 45 to 30 years to better account for the average career length for a teacher. In Virginia, teachers are eligible for their full pension if they are at least age 50 with 30 years of teaching service, which means that many RPS teachers will not even reach the top of the 45-year schedule before retirement. Condensing the salary schedule to a realistic service tenure will help increase yearly salary gains for teachers; this policy change results in additional annual salary gains of roughly $373 per year for teachers with their bachelor's degree, $391 for master's degree-holding teachers and $411 doctorate-holding teachers. In real dollars, average wages for Virginia teachers decreased by 8.1% from 1969-2017 (NCES, 2017). With proper implementation and promotion, this substantial shift in teacher wage policy could curb the historical trends harming the profession and re-energize the labor market as it emerges from the COVID-19 pandemic. Above all, this alternative rewards teacher experience and longevity by longer tenure with RPS. This policy alternative increases RPS yearly teacher salary expenditures by $6-$7 million.

This alternative concurs with **Dreams4RPS Priority 2 Action 3** (Skilled and Supported Staff), which involves redesigning compensation systems to ensure that (1) RPS teachers are paid at, or above, the Virginia average; (2) RPS teachers serving in our highest-priority schools are the highest paid in the Commonwealth; and (3) all roles have a clear and consistent salary progression, year over year.

Effect on outcome: These alternative targets two subsets of teachers vulnerable to attrition: young teachers and teachers approaching retirement. Higher pay increases for newer teachers could help more stay in the profession, and could also motivate older, more experienced teachers to teach for longer thanks to increased financial incentive to do so. Simulations suggest that fairly large salary increases are needed to reduce attrition out of Milwaukee down to the levels experienced by the average Wisconsin district (Imazeki, 2005). This alternative would dramatically increase RPS's appeal as a professional destination for talented teachers. Ideally, at peak efficiency, this bold revision to the RPS salary structure returns retention rates to Virginia's pre-Great Recession state average of 89.7% (Miller, 2018). New, inexperienced teachers turnover at higher rates relative to more experienced colleagues who are not yet eligible to retire, and turnover rates increase once again as veteran teachers approach retirement (Allensworth et al., 2009; Ingersoll, 2001; Marvel, Lyter, Peltola, Strizek, & Morton, 2007).

Political Feasibility (4): Recently, the Richmond City Council has showed willingness to improve pay raises (including 3.25% last year) in addition substantial increases to the RPS budget (ORD.2021-054). Granted, this alternative represents a substantial addition to the RPS budget at a little over $6 million per year, which makes this alternative the least feasible of the three in terms of garnering approval. City council's ongoing reluctance to approve $7.3 million in funding for George Wythe High School is a clear indicator of this policy's low feasibility. With finances already spread thin and state funding possibly shrinking due to changes in property values, Richmond is not likely to approve this drastic change to the teacher pay scale any time soon. While this policy is the most effective at achieving

Administrative Feasibility (4): Completely revamping the teacher salary schedule involves serious adjustments to everything from budget and accounting operations to recruitment. This alternative cannot succeed without significant additional support, which likely includes contracting outside financial consultation and increased administrative costs.

Equity (1): More than any policy alternative in this project, this salary schedule compression would likely make Richmond an appealing destination for both new and experienced teachers to establish a career in the school, which means students could enjoy learning from a more stable and consistent group of teachers. This alternative is a concerted effort to close the worst-in-the-nation 32.7% teacher wage penalty in Virginia by the City of Richmond (EPI, 2019). Compressing the salary schedule would increase Richmond's appeal as a destination for qualified teachers, which helps outcomes for disadvantaged students—this is the most equitable alternative.

Cost-Effectiveness Ratio (1): .243
Though this salary adjustments likely helps bring Richmond to the teacher retention state average within the policy period with proper implementation, it represents a large expenditure that simply Richmond simply cannot bear. The substantial increase in qualified teachers roughly 900) retained in relation to the large salary increase make this the most cost-effective option. Simultaneously, however, this policy's total cost remains unclear because of incomplete data access. Calculating cost-effectiveness is also difficult due to general lack of empirical data and literature on this policy initiative, specifically.

Alternative 4: $600,000 Professional Development Fund for Teachers and Administrators

This policy creates a permanent funding structure for teachers to receive assistance with loans, tuition, and other financial requirements associated with professional development as they pursue full licensure. This fund will be advertised to teachers and doled out through an application system overseen by the RPS Talent Office. The policy is inspired by VDOE's recent allocation of $12 million to a variety of programs as part of its ongoing teacher recruitment and retention efforts, including $2 million to encourage and assist aspiring educators and other school staff to earn full state teaching licensure. Funding was made possible through the Elementary and Secondary School Emergency Relief [ESSER] fund, and this policy would establish this support fund as a permanent expenditure to help struggling school districts hire and retain teachers.

While designed for provisionally licensed teachers, the fund also includes additional funding for any teachers or administrators to take courses, attend conferences, or conduct research. The fund will be replenished on an annual basis, and any unused funds will roll over into the following fiscal year. Additionally, the funding specifically for provisionally licensed teachers will vary based on the number of provisionally license teacher on-staff. The equation below will determine its balance.

This alternative is a means to help achieve **Dreams4RPS Priority 2 Action 4** (Professional Development): Provide meaningful, job-embedded, and long-term professional development for teachers and administrators on new, to-be-adopted English and math curricula and launch a one-year intensive training program for new teachers and principals. In addition to core subject areas,

RPS can also leverage university partnerships to also improve the organizational health and synergy within more challenged school districts.

Effect on outcome: This alternative takes inspiration from Florida's Critical Teacher Shortage Program, which provided direct payments and loan forgiveness to early career teachers who were certified and taught in critical shortage subject areas. They found that relatively modest payments of $500 to $1,000 substantially reduced teacher attrition, in some cases by as much as **25 percent** (Feng and Sass, 2018)**.** As RPS continues to focus on recruiting and retaining qualified teachers, these modest payments provide a much-needed boon to ongoing efforts. According to 12 qualitative interviews conducted with provisionally licensed teachers in Summer 2021 as part of my internship, financial strain for teachers' education was cited as a principal issue. Increasing Richmond's capacity to create academic and professional development opportunities for teachers at no cost to them, especially for its new teachers.

Political Feasibility (2): Just last April, Richmond City Council approved grant funding allocations for professional development materials for implementing the new math curriculum (RES.2021-R020). This fund only slightly increases yearly expenditures while addressing a key problem area in the provisional process. Understanding Richmond's reliance on provisionally licensed teachers, the mayor's office and city council could significantly improve efficiency by investing in professional development.

Administrative Feasibility (3): Due to administrative burden required to track and dispense funds, this alternative is less straightforward and therefore less administratively feasible. Unlike the second alternative, this likely requires additional administrative staffing to account for the increased responsibility.

Equity (4): This alternative ranks slightly below the administrative improvements and direct compensation changes as it focuses on subsidizing teacher improvement rather than providing administrative or financial support. Beyond helping new teachers as they work to complete coursework and exams, it only helps teachers with the time to take on professional development voluntarily.

Cost-Effectiveness Ratio (2): .251
Though slightly better than direct cash payments and the status quo, the difference in cost-effectiveness is ultimately negligible. This policy estimates fewer retained teachers but is also less expensive. Like the career counselors (Altermative 1), this policy significantly addresses outcomes for provisionally licensed teachers, which is extremely important to gaining qualified teachers in the long run.

X. Final Evaluation

Final Policy Recommendation:
Based on strong performance across equity as well as political and administrative feasibility categories, I recommend that RPS, in cooperation with city officials, pursue one or both of the following policy alternatives:

- Alternative 1: Hire licensure coordinator/career counselor to oversee each of Richmond Public Schools' nine districts
- Alternative 2: Targeted financial incentives for teachers in high-needs schools ($1,000 per year) with $500-$750 phase-in period through 2032

As the most cost-effective policy, Alternative 1 utilizes additional staffing to provide better support to teachers, especially the new and provisionally licensed teachers more vulnerable to turnover. While slightly less cost-effective than two other alternatives, Alternative 2 remains equal to the status quo while increasing the total number of certified teachers in RPS. Downstream effects higher teacher retention on critical student outcomes like on-time graduation and postsecondary enrollment are sure to benefit from this stronger labor force (NBER, 2018). In terms of political and administrative feasibility, Alternative 2 is the most straightforward. City and school officials are providing direct aid to teachers in a struggling district trying to recover from COVID-19, and the administrative infrastructure for determining eligibility and dispersing incentives is already in place. While less politically palatable, Alternative 1 is a strong signal to teachers that RPS intends to increase administrative support available to them. Alternative 1: Hire licensure coordinator/career counselors to oversee each of Richmond Public Schools' nine districts is extremely important to securing the long-term administrative health of RPS, ease of licensure processes, and support for teachers.

Both alternatives are highly likely to entice teachers to move toward or stay in schools that desperately need the extra classroom personnel. Furthermore, any new provisionally licensed teachers entering the RPS system have more discretion regarding how they use their bonus than they would with Alternative 4; these can include education, living expenses, or other financial responsibilities. Unlike Alternative 4: $600,000 Professional Development Fund for Teachers and Administrators, this policy covers a larger subset of RPS teachers. Alternative 3: Condense salary schedule from 45 to 30 years while retaining top salary rate is unfeasible and by-far the costliest, but it at least indicates the required scale that required to truly address teacher attrition problems in Richmond and beyond. Overall, based on specified criteria and present circumstance, Alternatives 1 and 2 are both excellent options for RPS to implement at this time.

Implementation and Other Considerations
RPS administrators and leadership can begin by preparing a proposal to city officials about this new incentive program. An important avenue to explore is the potential for these incentives to be funded by federal grants or COVID-19 relief funding.

Steps to implement
1. Relevant personnel from the School Board Office, Engagement Office, Operating Office, and Talent Office draft a proposal to be sent to Mayor Stoney's office emphasizing elements the importance of supporting teachers in COVID-19 recovery efforts, increasing certification rates

for new teachers, the ongoing teacher shortage, and need for better teacher retention in RPS. In addition, budget authorities will need to provide an estimate of associated costs, overall effect on teacher retention, and student outcomes.

2. A successful coalition of RPS and the Mayor's Office in lobbying the city council to improve this addition to the budget for the next academic year. The two-year phase-in period will help budgetary operations adjust accordingly, but ideally the administrative replacement costs spared by increased teacher retention.

3. During the phase-in period, Talent Acquisition and Engagement can jointly strategize on how best to incorporate this new policy into their recruitment and publicity strategies. Cooperation among these offices will be paramount to ensuring that this policy realizes peak efficiency and maximum effect.

4. In the years following implementation, studies are likely necessary to track efficacy withing RPS, but also to add to the growing body of research on teacher retention. As an entity with teacher retention as a central focus, VCU's Metropolitan Education Research Consortium [MERC] are a likely candidate to track this policy's net effect on everything from teacher retention. RPS can also utilize its increasing data capabilities in ongoing data gathering efforts on teacher satisfaction and retention, and perhaps try to isolate the effect of this specific policy.

Limitations and Additional Considerations

While these policies work to keep certified teachers in classrooms, the main desired outcome related to this project, there are many ways for RPS to continue improving. Additionally, RPS continuing to increase its ability to gather, analyze, and share data publicly is extremely important to building understanding about teacher retention and how best to improve it. The recent decision to allow teachers to collectively bargain illustrates the growing need for teacher support as the profession tries to reverse a decade-plus

Due to stagnant, entrenched funding structures at the state level, these policies place responsibility squarely on RPS. While state-level funding appears to be increasing annually, this additional funding does not appear to affect any tangible change at the classroom level, particularly as it relates to localities with high proportions of low-income students (Masters, 2022). To truly pursue educational equity and justice, the Commonwealth of Virginia must seriously reconsider how it supports localities in education. Adjusted for inflation, school funding has yet to reach pre-2008 levels—this must be corrected. While outside the Richmond scope, RPS and city officials must continue advocating for better resources from the Commonwealth. Finally, with limited access to data throughout this project, the primary evidence for policy results is derived from the literature, studies, and interventions in other areas; results could differ in the Richmond context.

Conclusion

With so many teachers leaving the profession over the past few years, which is only exacerbated by COVID-19, there seems to be a sense of alienation creeping over the profession as teachers are asked to do more with fewer resources. Being a teacher is difficult, and the growing numbers leaving the profession each year across the country indicate that current policy

is not sustainable. Teachers I have talked to over the course of my project with Richmond Public Schools have cited their colleagues as a primary reason why they're able to keep going—stronger support systems are necessary to reverse the current trends. Important to improving schools is how we empower teachers, education's street-level bureaucrats, to have agency in their classrooms and in the reform process. As currently constructed, inequity is baked into Virginia's approach to resourcing public schools; the LCI is based on capacity to create revenue rather than student needs. Resource disparities lead schools to be enriching for some and a pointless exercise for others, usually along racial and socioeconomic lines. Failure to acknowledge the economic conditions that affect schools during institutional decisions, particularly in cities and rural areas, means that those problems will persist. For top to bottom, Virginia's approach to education needs serious adjustment to create tangible changes to student experiences and outcomes.

From its very conception, America has never truly recognized education as integral to achieving its lofty democratic ideals. As I worked with teachers and administrators, tutor students, and try to understand these deeply entrenched, interconnected issues, that central idea weaves its way through even the smallest interaction. In Richmond specifically, administrators and teachers must contend with the challenges of being under-resourced, understaffed, and overworked—this a problem in schools across the country. Nevertheless, they devote their lives and careers to serving their students. So many demands are made of our teachers and administrators while they continued to be denied the resources necessary to do so. Public education is approaching an important inflection point at which the country, states, districts, and schools will prioritize the needs of schools and, most importantly, their students.

XI. Appendices

Appendix 1: CEA Methodology Continued
Status Quo Equation

$2,338.35 (NPV) / 8,875 (Total Teachers Retained 2022-2029) = .250 (CE Ratio)

Alternative 1 Cost Equation
Costs: (9 employees * $32/hour * 8 hours/day * 230-day contract) + Total RPS Expenditure

CE: $2,341.18 (NPV) / 9,502 (Total Teachers Retained 2022-2029) = .246 (CE Ratio)

A1 Assumptions

- These nine new employees will be paid $48,880, or roughly the same as a Regional Instructional Career Counselor as stipulated under the current RPS salary schedule.

Alternative 2 Cost Equation
Costs: (Teachers retained under status quo + additional teachers retained due to policy) * .86 (assumed proportion of teachers in Title I schools) * direct payment + $3,000 administrative costs + Total RPS Expenditure

CE: $2,344.65 (NPV) / 9,386 (Total Teachers Retained 2022-2029) = .250 (CE Ratio)

A2 Assumptions

- If fully implemented in Richmond, this policy alternative would lead to a roughly 20% reduction in yearly teacher attrition by its fifth year—peak efficiency.
- Richmond does not currently track the number of teachers in each school. To determine the amount of funding required for this program, Personnel Spending for Title 1 Schools was divided by total spending to equal 86% (see spreadsheet).
    - Given that 39 of Richmond's 50 public schools are Title I-eligible, this estimate makes sense, especially given that most all of Richmond's large middle and high schools are eligible.
    - The equation used to devise incentive structure is as follows:

Alternative 3 Cost Equation

Costs: Yearly Increase of RPS Teacher Salaries + Total RPS Expenditure

CE: $2,379.4 (NPV) / 9,776 (Total Teachers Retained 2022-2029) = .243 (CE Ratio)

A3 Assumptions

- While expensive, this serious reconsideration of Richmond's teacher wage scale is likely the most effective of the alternatives regarding improved teacher retention, but the least cost-effective.

- Yearly cost allocation was determined using the current RPS teacher salary scale (see Appendix)
    - This scale was reconciled with a breakdown of teacher experience and education level using data from both the Virginia Department of Education (degree earned) and a report by Bellweather Education Partners.
    - Using a rough distribution along these criteria, the salary scale compression was applied assuming a normal, 200-day contract.
        - RPS has four yearly contract lengths: 200, 210, 230, and 260 days. Since a breakdown by subject area was unavailable, knowing which contract length to apply to each teacher was impossible.

Alternative 4 Equation

Costs: ($400 per credit hour * 4 credit hours * 300 provisionally licensed teachers) + $120,000 in additional funding for other professional development + $6,000 promotion/administrative costs + Total RPS Expenditure

$2,340.87 (NPV) / 9,334 (Total Teachers Retained 2022-2029) = .251 (CE Ratio)

A4 Assumptions

- Take-up rate is initially slow as teachers become aware of new resources but will accelerate as the policy approaches peak efficiency

Appendix 2: CE Baseline Estimates

School Year	**2018-2019 (actual)**	**2019-2020 (actual)**	**2020-2021 (actual)**	**2021-2022 (actual)**	**2022-2023 (proposed)**	**2023-2024**	**2024-2025**	**2025-2026**	**2026-2027**	**2027-2028**	**2028-2029**
RPS Total Operating Budget (revenue)	$298.20	$306.80	$331.10	$347.50	$354.5	$361.5	$368.8	$376.1	$383.7	$391.3	$399.2
RPS Operating Budget, local appropriation (in millions)	$156.70	$175.20	$180.70	$185.30	$189.0	$192.8	$196.6	$200.6	$204.6	$208.7	$212.9
Percentage Change, Local Appropriation	-1.50%	12%	3%	2.60%	2%	2%	2%	2%	2%	2%	2%
RPS Share of Total Operating Costs	53%	57%	55%	53.00%	53%	53%	53%	53%	53%	53%	53%
Cost Category Totals in millions (RPS share)											
Personnel Services	$159.2	$161.5	$181.7	$192.8	$196.7	$200.6	$204.6	$208.7	$212.9	$217.1	$221.5
Other Compensation (bonuses/incentives)	$11.5	$11.2	$6.0	$6.1	$6.2	$6.3	$6.5	$6.6	$6.7	$6.9	$7.0
Employee Benefits	$71.4	$71.9	$85.2	$89.8	$91.6	$93.4	$95.3	$97.2	$99.1	$101.1	$103.2
Purchased Services	$20.6	$18.7	$21.7	$22.5	$23.0	$23.4	$23.9	$24.4	$24.8	$25.3	$25.8
Other Charges	$18.2	$15.8	$17.1	$16.9	$17.2	$17.6	$17.9	$18.3	$18.7	$19.0	$19.4
Supplies and Materials	$9.3	$9.7	$8.4	$8.6	$8.8	$8.9	$9.1	$9.3	$9.5	$9.7	$9.9
Other Operating Expense	$2.9	$2.4	$3.7	$3.6	$3.7	$3.7	$3.8	$3.9	$4.0	$4.1	$4.1
Capital Outlay	$2.5	$3.3	$1.9	$1.1	$1.1	$1.1	$1.2	$1.2	$1.2	$1.2	$1.3
Other Uses of Funds	$7.3	$8.0	$5.5	$5.9	$6.0	$6.1	$6.3	$6.4	$6.5	$6.6	$6.8
Total Expenditure	**$298.2**	**$302.6**	**$331.1**	**$347.3**	**$354.2**	**$361.3**	**$368.6**	**$375.9**	**$383.4**	**$391.1**	**$398.9**
data sources: RPS Annual Budgets, Bellweather Education											
Status Quo Teacher Outcomes	**2018-2019**	**2019-2020**	**2020-2021 projected**	**2021-2022**	**2022-2023**	**2023-2024**	**2024-2025**	**2025-2026**	**2026-2027**	**2027-2028**	**2028-2029**
Teacher Retention Rate	76.30%	75.00%	74%	76%	76%	77%	77%	78%	78%	78%	78%
Total K-12 Enrollment (RPS 2019 Demographic Projection data)	23,193	23,545	27,214	27,721	28,228	28,735	28,752	28,769	28,786	28,803	28,820
Total Teachers at beginning of year assuming ~17:1 student-teacher ratio (Teachers Retained for Following Year)	1,693 (1,292)	1,650 (1,256)	1,625 (1,235)	1,630 (1,239)	1,640 (1,246)	1,646 (1,267)	1,636 (1,260)	1,620 (1,264)	1,645 (1,283)	1,625 (1,268)	1,650 (1,287)
Proportion of Teachers on Provisional Licenses	13%	13.40%	13.60%	14.40%	15%	16%	17%	16%	15%	14%	14%
Cost of Replacing Lost Teachers in millions (assuming $18,000 cost)	$6.77	$6.44	$6.64	$7.11	$7.23	$7.20	$6.64	$6.48	$6.86	$6.16	$6.88

Data Courtesy: RPS, VDOE, Bellweather Education Partners

Appendix 3: CE Policy Alternative Effects and Costs

Reduction in Teacher Attrition	Predicted Reduction in Yearly Teacher Attrition (peak)			Teacher Retention Increase	2022-2023	2023-2024	2024-2025	2025-2026	2026-2027	2027-2028	2028-2029
Alternative 1: Licensure/Talent Staffmember in Schools	-30%				10%	15%	25%	30%	30%	30%	30%
Alternative 2: Financial Incentives for High-Needs School Teachers	-25%				10%	15%	25%	25%	25%	25%	25%
Alternative 3: Salary Schedule Compression	-40%				15%	30%	35%	40%	40%	40%	40%
Alternative 4: Professional Development Fund	-20%				10%	20%	20%	20%	20%	20%	20%
				implement			peak efficiency				
New Outcomes For Policy Alternatives	**2018-2019**	**2019-2020**	**2020-2021**	**2021-2022**	**2022-2023**	**2023-2024**	**2024-2025**	**2025-2026**	**2026-2027**	**2027-2028**	**2028-2029**
Status Quo	76.30%	75.00%	74%	76%	76%	77%	77%	78%	78%	78%	78%
Alternative 1: Licensure/Talent Staffmember in Schools	76.30%	75.00%	74%	76%	78%	80%	83%	85%	85%	85%	85%
Alternative 2: Financial Incentives for High-Needs School Teachers	76.30%	75.00%	74%	76%	78%	80%	83%	83%	83%	83%	83%
Alternative 3: Salary Schedule Compression	76.30%	75.00%	74%	76%	80%	84%	85%	87%	87%	87%	87%
Alternative 4: Professional Development Fund	76.30%	75.00%	74%	76%	78%	82%	82%	82%	82%	82%	82%
Yearly Additional Teachers Retained vs Status Quo Projection	**2018-2019**	**2019-2020**	**2020-2021**	**2021-2022**	**2022-2023**	**2023-2024**	**2024-2025**	**2025-2026**	**2026-2027**	**2027-2028**	**2028-2029**
Status Quo Retention (projected)	1,693 (1,292)	1,650 (1,256)	1,625 (1,235)	1,630 (1,239)	1,640 (1,246)	1,646 (1,267)	1,636 (1,260)	1,620 (1,264)	1,645 (1,283)	1,625 (1,268)	1,650 (1,287)
Alternative 1: Licensure/Talent Staffmember in Schools	n/a	n/a	n/a	n/a	33	49	94	107	115	113	116
Alternative 2: Financial Incentives for High-Needs School Teachers	n/a	n/a	n/a	n/a	33	49	94	89	82	81	83
Alternative 3: Salary Schedule Compression	n/a	n/a	n/a	n/a	66	116	131	145	148	146	149
Alternative 4: Professional Development Fund	n/a	n/a	n/a	n/a	33	83	82	64	66	65	66
Program Yearly Costs to RPS in millions	**2018-2019**	**2019-2020**	**2020-2021**	**2021-2022**	**2022-2023**	**2023-2024**	**2024-2025**	**2025-2026**	**2026-2027**	**2027-2028**	**2028-2029**
Status Quo	$298.2	$302.6	$331.1	$347.3	$354.2	$361.3	$368.6	$375.9	$383.4	$391.1	$398.9
Alternative 1: Licensure/Talent Staff Upgrades	n/a	n/a	n/a	$0.12	$0.44	$0.44	$0.45	$0.45	$0.46	$0.46	$0.47
New Total Alternative 1				$347.42	$354.64	$361.74	$369.05	$376.35	$383.86	$391.56	$399.37
Alternative 2: Financial Incentives for High-Needs School Teachers	n/a	n/a	n/a	n/a	$0.55	$0.84	$1.17	$1.09	$1.17	$1.16	$1.18
New Total Alternative 2					$354.75	$362.14	$369.77	$376.99	$384.57	$392.26	$400.08
Alternative 3: Salary Schedule Compression	n/a	n/a	n/a	n/a	$6.40	$6.46	$6.53	$6.59	$6.66	$6.73	$6.79
New Total Alternative 3					$360.60	$367.76	$375.13	$382.49	$390.06	$397.83	$405.69
Alternative 4: Professional Development Fund	n/a	n/a	n/a	n/a	$0.60	$0.25	$0.30	$0.40	$0.45	$0.42	$0.41
New Total Alternative 4					$354.80	$361.55	$368.90	$376.30	$383.85	$391.52	$399.31

Appendix 4: CE Calculation

Base Year	2018-2019														
Discount Rate	3%														
Academic Year	**2018-2019**	**2019-2020**	**2020-2021**	**2021-2022**	**2022-2023***	**2023-2024**	**2024-2025**	**2025-2026**	**2026-2027**	**2027-2028**	**2028-2029**	**NPV**	**Additional Teachers Retained**	**Total Teachers Retained (policies 2022-2029)**	**Cost-Effectiveness Ratio**
Year (costs expressed in thousands)	0	1	2	3	4	5	6	7	8	9	10				
Status Quo	$298.2	$302.6	$331.1	$347.3	$354.2	$361.3	$368.6	$375.9	$383.4	$391.1	$398.9	$2,338.35	n/a	8,875	**0.250**
Alternative 1: Licensure/Talent Staffmember in Schools	n/a	n/a	n/a	$347.42	$354.64	$361.74	$369.05	$376.35	$383.86	$391.56	$399.37	$2,341.18	627	9,502	**0.246**
Alternative 2: Financial Incentives for High-Needs School Teachers	n/a	n/a	n/a	n/a	$354.75	$362.14	$369.77	$376.99	$384.57	$392.26	$400.08	$2,344.65	511	9,386	**0.250**
Alternative 3: Salary Schedule Compression	n/a	n/a	n/a	n/a	$360.60	$367.76	$375.13	$382.49	$390.06	$397.83	$405.69	$2,379.40	901	9,776	**0.243**
Alternative 4: Professional Development Fund	n/a	n/a	n/a	n/a	$354.80	$361.55	$368.90	$376.30	$383.85	$391.52	$399.31	$2,340.87	459	9,334	**0.251**

Appendix 5: Policy Alternative 3 Teacher Experience/Education Breakdown

Rough Distribution of Teachers sort by years of experience, degree attained (data courtesy: RPS, 2021; Bellweather Education Partners, 2016)					
Bachelor's Degree (41%)	Total Teachers: 1693		694		
Years of Experience	**Number of Teachers**	**Current Median Salary Under 45-year Schedule**	**New Median Salary for Degree, Experience Level**	**Difference**	**Additional Wage Costs**
5 or less	312	$50,546	$51,665	$1,119	$349,463.70
6*10	111	$53,499	$56,483	$2,984	$331,343.36
11*20	146	$58,038	$63,633	$5,595	$815,415.30
21*30	76	$65,198	$74,523	$9,325	$711,870.50
30-plus	49	$74,962	$82,273	$7,311	$355,168.38
Master's Degree (56%)			948		
Years of Experience	**Number of Teachers**		**New Median Salary for Degree, Experience Level**		
5 or less	427	$53,000	$54,173	$1,173	$500,401.80
6*10	152	$56,172	$59,300	$3,128	$474,455.04
11*20	199	$60,938	$66,803	$5,865	$1,167,604.20
21*30	104	$68,457	$78,250	$9,793	$1,021,214.04
30-plus	66	$78,711	$86,386	$7,675	$509,313.00
Doctoral Degree (2%)			34		
Years of Experience	**Number of Teachers**		**New Median Salary for Degree, Experience Level**		
5 or less	15	$55,641	$56,784	$1,143	$17,487.90
6*10	5	$58,972	$62,260	$3,288	$17,886.72
11*20	7	$63,975	$70,140	$6,165	$44,018.10
21*30	4	$71,865	$82,140	$10,275	$38,428.50
30-plus	2	$82,361	$90,689	$8,328	$19,820.64
				Total	**$6,373,891.18**

Appendix 6: Local Composite Index Formula (source: Virginia Department of Education)

COMPOSITE INDEX OF LOCAL ABILITY-TO-PAY FORMULA

Average Daily Membership (ADM) Component =

$$.5\left[\frac{\text{Local True Values / Division ADM}}{\text{State True Values / State ADM}}\right] + .4\left[\frac{\text{Local Adjusted Gross Income / Division ADM}}{\text{State Adjusted Gross Income / State ADM}}\right] + .1\left[\frac{\text{Local Taxable Retail Sales / Division ADM}}{\text{State Taxable Retail Sales / State ADM}}\right]$$

Population Component =

$$.5\left[\frac{\text{Local True Values / Local Population}}{\text{State True Values / State Population}}\right] + .4\left[\frac{\text{Local Adjusted Gross Income / Local Population}}{\text{State Adjusted Gross Income / State Population}}\right] + .1\left[\frac{\text{Local Taxable Retail Sales / Local Population}}{\text{State Taxable Retail Sales / State Population}}\right]$$

Final Composite Index =

((.6667 x ADM Component) + (.3333 x Population Component)) x 0.45

Appendix 7: RPS Salary Schedule (source: Richmond Public Schools)

YEARS	GRADE	095	195	295	100	200	300	110	210	310	120	220	320
OF	LANE	B	M	M+30	B	M	M+30	B	M	M+30	B	M	M+30
EXPERIENCE	DAYS	200	200	200	210	210	210	230	230	230	260	260	260
0	Step 00	$48,745	$51,182	$53,732	$51,182	$53,741	$56,418	$56,057	$58,858	$61,791	$63,369	$66,537	$69,852
1	Step 01	$49,316	$51,782	$54,359	$51,782	$54,371	$57,077	$56,714	$59,549	$62,513	$64,111	$67,316	$70,666
2	Step 02	$49,892	$52,387	$54,996	$52,387	$55,007	$57,745	$57,376	$60,246	$63,245	$64,860	$68,104	$71,494
3	Step 03	$50,476	$53,000	$55,641	$53,001	$55,650	$58,423	$58,048	$60,949	$63,987	$65,619	$68,901	$72,333
4	Step 04	$51,067	$53,620	$56,291	$53,621	$56,300	$59,103	$58,728	$61,662	$64,732	$66,388	$69,704	$73,176
5	Step 05	$51,665	$54,247	$56,950	$54,248	$56,959	$59,797	$59,415	$62,384	$65,493	$67,164	$70,520	$74,034
6	Step 06	$52,268	$54,880	$57,616	$54,883	$57,624	$60,497	$60,109	$63,112	$66,259	$67,949	$71,345	$74,902
7	Step 07	$52,881	$55,523	$58,290	$55,525	$58,300	$61,204	$60,813	$63,853	$67,032	$68,745	$72,180	$75,777
8	Step 08	$53,499	$56,172	$58,972	$56,174	$58,982	$61,919	$61,525	$64,599	$67,817	$69,550	$73,024	$76,662
9	Step 09	$54,125	$56,831	$59,662	$56,831	$59,672	$62,645	$62,244	$65,356	$68,610	$70,362	$73,880	$77,559
10	Step 10	$54,757	$57,496	$60,360	$57,496	$60,369	$63,379	$62,971	$66,120	$69,414	$71,184	$74,744	$78,468
11	Step 11	$55,399	$58,168	$61,067	$58,167	$61,077	$64,120	$63,708	$66,893	$70,226	$72,018	$75,620	$79,385
12	Step 12	$56,047	$58,850	$61,780	$58,849	$61,792	$64,869	$64,454	$67,677	$71,047	$72,861	$76,504	$80,314
13	Step 13	$56,703	$59,538	$62,503	$59,538	$62,515	$65,627	$65,208	$68,468	$71,879	$73,714	$77,399	$81,255
14	Step 14	$57,365	$60,235	$63,235	$60,233	$63,247	$66,397	$65,970	$69,271	$72,719	$74,575	$78,306	$82,205
15	Step 15	$58,038	$60,938	$63,975	$60,940	$63,986	$67,174	$66,744	$70,079	$73,572	$75,450	$79,219	$83,167
16	Step 16	$58,716	$61,653	$64,723	$61,652	$64,734	$67,960	$67,523	$70,901	$74,432	$76,330	$80,148	$84,141
17	Step 17	$59,404	$62,373	$65,479	$62,374	$65,493	$68,754	$68,314	$71,730	$75,300	$77,225	$81,086	$85,122
18	Step 18	$60,098	$63,102	$66,245	$63,103	$66,258	$69,557	$69,114	$72,568	$76,182	$78,128	$82,033	$86,118
19	Step 19	$60,802	$63,840	$67,022	$63,841	$67,032	$70,374	$69,923	$73,417	$77,075	$79,043	$82,993	$87,129
20	Step 20	$61,512	$64,588	$67,806	$64,588	$67,816	$71,196	$70,739	$74,275	$77,976	$79,965	$83,964	$88,147
21	Step 21	$62,233	$65,345	$68,598	$65,344	$68,611	$72,027	$71,567	$75,147	$78,888	$80,902	$84,948	$89,177
22	Step 22	$62,960	$66,110	$69,400	$66,107	$69,414	$72,870	$72,404	$76,024	$79,811	$81,848	$85,941	$90,221
23	Step 23	$63,698	$66,881	$70,215	$66,882	$70,225	$73,724	$73,252	$76,913	$80,746	$82,807	$86,945	$91,279
24	Step 24	$64,443	$67,665	$71,034	$67,664	$71,048	$74,586	$74,109	$77,814	$81,689	$83,775	$87,965	$92,345
25	Step 25	$65,198	$68,457	$71,865	$68,457	$71,880	$75,460	$74,977	$78,726	$82,645	$84,758	$88,994	$93,426
26	Step 26	$65,960	$69,257	$72,708	$69,257	$72,720	$76,343	$75,853	$79,646	$83,614	$85,746	$90,035	$94,519
27	Step 27	$66,732	$70,068	$73,557	$70,069	$73,571	$77,236	$76,742	$80,577	$84,592	$86,751	$91,087	$95,625
28	Step 28	$67,511	$70,887	$74,418	$70,887	$74,432	$78,139	$77,638	$81,520	$85,580	$87,765	$92,153	$96,743
29	Step 29	$68,301	$71,716	$75,289	$71,716	$75,302	$79,054	$78,546	$82,474	$86,583	$88,791	$93,231	$97,876
30	Step 30	$69,102	$72,556	$76,171	$72,556	$76,184	$79,980	$79,468	$83,439	$87,596	$89,832	$94,323	$99,021
31	Step 31	$69,909	$73,404	$77,059	$73,404	$77,074	$80,913	$80,395	$84,415	$88,619	$90,882	$95,426	$100,178
32	Step 32	$70,727	$74,264	$77,962	$74,264	$77,976	$81,860	$81,336	$85,403	$89,656	$91,945	$96,543	$101,351
33	Step 33	$71,554	$75,131	$78,874	$75,131	$78,889	$82,817	$82,287	$86,402	$90,705	$93,020	$97,671	$102,535
34	Step 34	$72,391	$76,010	$79,797	$76,011	$79,811	$83,787	$83,251	$87,412	$91,767	$94,109	$98,813	$103,737
35	Step 35	$73,239	$76,900	$80,730	$76,902	$80,745	$84,767	$84,225	$88,435	$92,839	$95,212	$99,970	$104,950
36	Step 36	$74,095	$77,800	$81,676	$77,799	$81,690	$85,760	$85,209	$89,470	$93,928	$96,324	$101,140	$106,179
37	Step 37	$74,962	$78,711	$82,631	$78,711	$82,646	$86,762	$86,207	$90,517	$95,025	$97,451	$102,324	$107,420

Appendix 8: Dreams4RPS Priority 2 (source: Richmond Public Schools)

ACTION 2.1 TOP TALENT Redesign the human resources department to ensure that: 1) RPS is able to fill every vacancy with a highly skilled professional; and 2) both our employees and our applicants receive outstanding customer service.

ACTION 2.2 DIVERSE TEACHERS Launch an effort explicitly focused on increasing and retaining the number of male teachers of color in RPS.

ACTION 2.3 COMPENSATION Redesign our compensation system to ensure that: 1) RPS teachers are paid at, or above, the Virginia average; 2) RPS teachers serving in our highest-priority schools are the highest paid in the Commonwealth; and 3) all roles have a clear and consistent salary progression, year over year.

ACTION 2.4 PROFESSIONAL DEVELOPMENT Provide meaningful, job-embedded, and long-term professional development for teachers and administrators on new, to-be-adopted English and math curricula and launch a one-year intensive training program for new teachers and principals.

ACTION 2.5 EQUITY AND INCLUSION Provide ongoing training to help RPS staff identify and confront our implicit biases with respect to race, economic status, country of origin or

citizenship status, LGBTQ identification, and other elements of personal identity. In doing so, affirm our commitment to ALL students and staff.

ACTION 2.6 UNIVERSITY PARTNERSHIPS Broaden partnerships with local schools of education to target high-need subject areas such as secondary math and science, special education, and ESL.

ACTION 2.7 CELEBRATION Launch an annual gala celebration to honor our educators.

ACTION 2.8 RVA INCENTIVES Collaborate with the City of Richmond and the Commonwealth of Virginia to implement incentives for top educators to come to, and stay in, RVA, including housing credits, tax credits, and tuition reimbursement

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