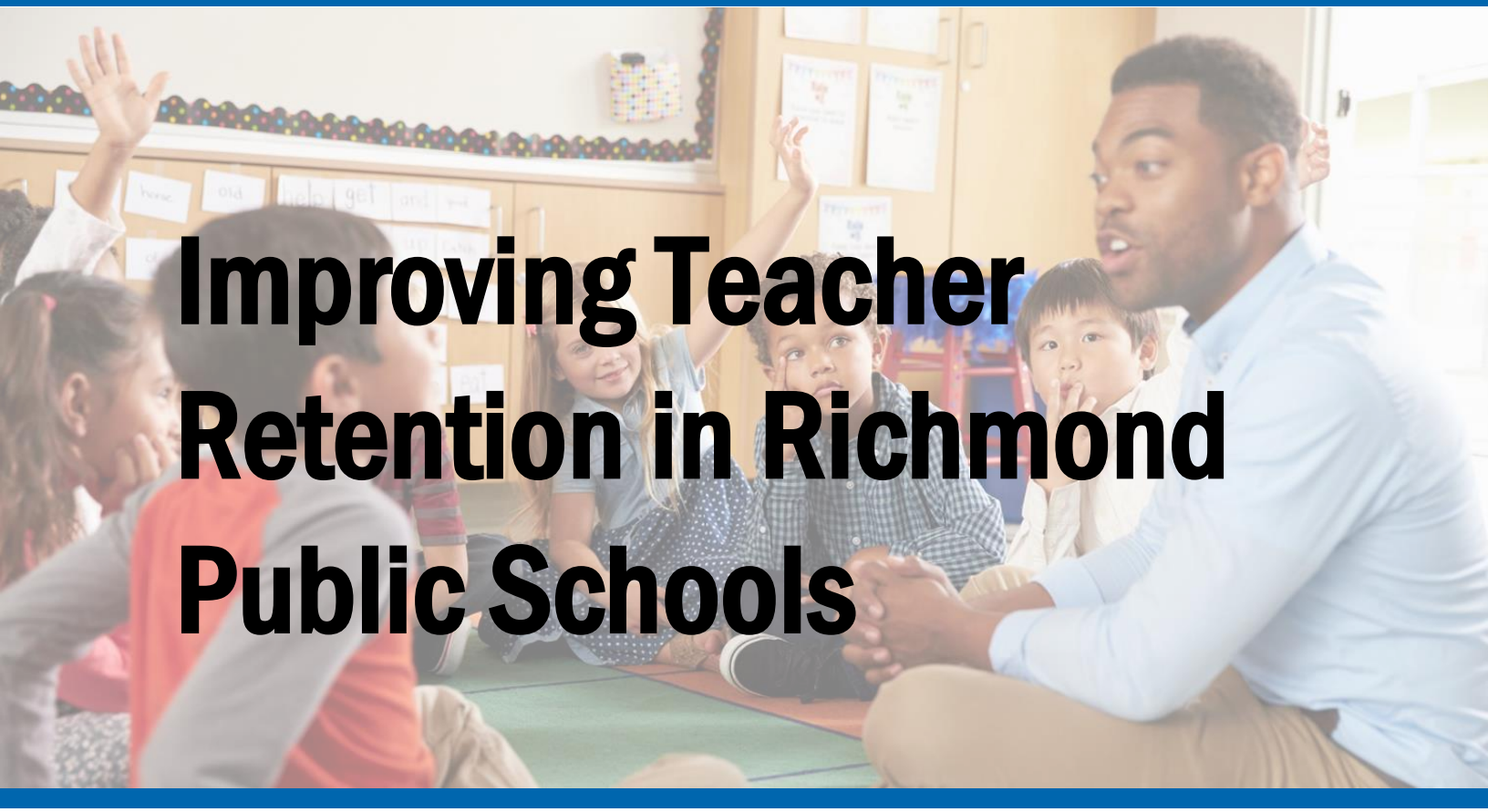

# Improving Teacher Retention in Richmond Public Schools

RPS RICHMOND PUBLIC SCHOOLS

Prepared by Erica Sachs

April 2023

UVA | FRANK BATTEN SCHOOL of LEADERSHIP and PUBLIC POLICY

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## Honor Statement

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

Erica N. Sachs 4/7/2023

## Disclaimers

This research was prepared using data publicly available from Richmond Public Schools and the Virginia Department of Education (VDOE). Any mention of products or organizations within this report are not endorsed by the organizations, the VDOE, UVA, or Richmond Public Schools. The Richmond Public School logo on the cover of this report accessible at https://www.rvaschools.net/ and the cover background image is from Shutterstock. The Batten School logo used in this report comes from https://batten.virginia.edu/.

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) has low teacher retention, with a recent in-division retention rate of 76.1%** (Bishop, 2022b). For the 2021-22 school year, RPS needed 2157 teachers (Richmond Public Schools, 2022b). If every spot was filled and 76.1% were retained, 516 teachers were no longer employed as RPS teachers in fall 2022 which cost the division roughly $13.43M.

**Teachers are the most influential school-based factor for students' academic achievement and life outcomes** (Chetty et al., 2014; Goldhaber et al., 1999; Hanushek, 2011; Jackson, 2018; Opper, 2019; Rivkin et al., 2005; Rockoff, 2004). Accordingly, developing and maintaining a high-quality teacher labor force is vital for the future of education. Teachers not being retained, also called turnover, is a major barrier to this goal. Turnover is negatively associated with student achievement. school functioning, professional learning, and teacher morale (Guin, 2004; Jackson et al., 2009; Ronfeldt et al., 2013). Further, it costs districts thousands of dollars per teacher (Barnes et al., 2007; National Commission on Teaching & America's Future, 2007).

**Teachers' career decisions are influenced by many factors** (i.e., see Grissom's framework, 2011), yet only some can be affected by division[1] decisions. Of RPS exit survey takers, 48% of respondents cited school context, 44% cited division context, and 23% cited compensation as one of their primary reasons for leaving RPS (Bishop, 2022b). These reasons are all potentially policy amenable and, thus, will be the focus of this report.

**I identified three policy approaches to approve teacher retention:**

1. *The Planned Status Quo*: salary increases, improved survey data, Title II funds, and more.
2. *Principal Development*: structured professional development and follow-up coaching.
3. *Teacher Development and Collaboration*: embedded collaboration and continuous personalized professional development.

I assessed each policy approach with the following criteria: (1) Limited Cost-Benefit Analysis, (2) Practical and Political Feasibility, and (3) Policy Sustainability.

**Based on my analysis, my recommendation is for RPS to plan and implement the principal professional development program in July 2024.** Principal development scored 14 points on my evaluation, compared to the status quo (8) or teacher development and collaboration (7).

[1] Virginia calls school districts "divisions".

## Introduction

Teachers are the most influential school-based factor for students' academic achievement and life outcomes (Chetty et al., 2014; Goldhaber et al., 1999; Hanushek, 2011; Jackson, 2018; Opper, 2019; Rivkin et al., 2005; Rockoff, 2004). How teachers affect students depends on the teacher's quality which is typically measured with a value-added[2] approach (Opper, 2019; Todd & Wolpin, 2003). Students whose teachers have a high value-added are more likely to have higher lifetime earnings, attend a higher quality college, and not have a child as a teenager (Backes et al., 2022; Chetty et al., 2014; Jackson, 2018). Therefore, developing and maintaining a high-quality teacher labor force is vital for the future of education.

Teachers not being retained, also called turnover, is a major barrier to this goal. In recent pre-pandemic years, the US turnover rate was near 15%[3] (Sutcher et al., 2016). Turnover can be positive or negative. Positive turnover occurs when teachers retire on time or ineffective teachers leave. Negative turnover, the focus of this report, is when turnover occurs at high rates, results in losing effective teachers, or leaves unfilled vacancies (Borman & Dowling, 2008). Turnover occurs unevenly across teacher populations, student demographics, and school locations, with nearly half of annual turnover occurring in around a quarter of US public schools (Ingersoll et al., 2021). Less prepared and experienced teachers have higher turnover than their fully credentialed or experienced peers (Carver-Thomas & Darling-Hammond, 2017; Grissom, 2011; Ingersoll et al., 2021; Lankford et al., 2002). In contrast, experienced teachers are more likely to stay in their careers but tend to migrate towards suburban schools (Ingersoll et al., 2011, 2021; Ingersoll, 2001). Veteran teachers also tend to migrate away from schools with greater proportions of economically disadvantaged, non-White, or lower-performing students; thus, the less credentialed teachers end up teaching at urban schools and those with disadvantaged student populations (Clotfelter et al., 2010; Darling-Hammond & Sykes, 2003; Dee & Goldhaber, 2017; Guin, 2004; Ingersoll et al., 2021; Ingersoll et al., 2018; Rivkin et al., 2005; Strong, 2005). The turnover cycle is continued as districts with turnover-related vacancies end up hiring less prepared, qualified, or experienced teachers (Dee & Goldhaber, 2017; Grissom, 2011). Consequently, turnover tends to be higher in Title I[4] and urban schools, as well as schools with large populations of low-income students or students of color (Carver-Thomas & Darling-Hammond, 2017; Dee & Goldhaber, 2017). Unfortunately, most schools in Richmond Public Schools resemble the descriptions of high turnover schools.

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[2] Value-added (VA) modeling enables researchers to determine the causal impact of teachers on students.

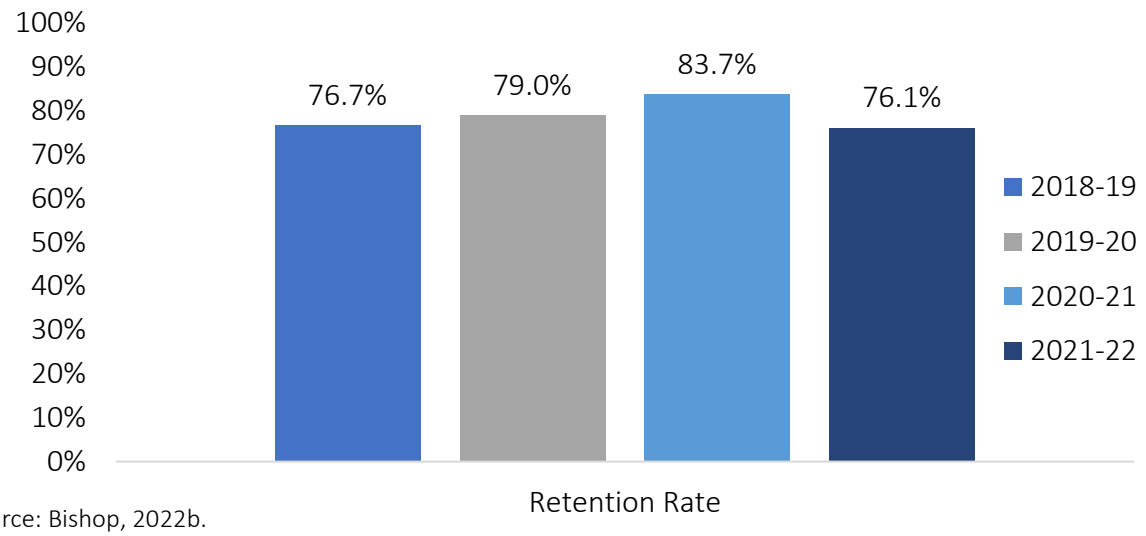
[3] Roughly 1/3 of annual turnover is from on-time retirement (Carver-Thomas & Darling-Hammond, 2017).

[4] Title I schools have large percentages of students from low-income families and receive federal funds, under Title I of the Elementary and Secondary Education Act, to help those students meet academic standards. Schools with at least 40% of students from low-income families can use funds for schoolwide programs (US Department of Education & NCES, 2019).

## Problem Statement

**Richmond Public Schools struggles to retain teachers, resulting in high teacher turnover. Turnover has been an ongoing problem for the last ten years, and the latest data reflect an annual retention rate of just 76.1%** (Bishop, 2022b; Richmond Public Schools, 2019). Retention and turnover rates convey the same information framed differently. Thus a 76.1% retention rate is equal to a 23.9% turnover rate. This rate indicates that nearly a quarter of RPS teachers from 2020-21 did not return to an in-division teaching position at the beginning of 2021-22 school year. Figure 1 (below) shows RPS' retention rates over the last few years.

Figure 1. RPS Retention Rates in Recent Years




Source: Bishop, 2022b.

RPS uses the Virginia Department of Education's (VDOE) calculation for retention. The rate is calculated by taking the percentage of school-based staff[5] present in the end-of-year Master Schedule who returned the following school year. As this calculation relies on end-of-year data, it is a lagged indicator of teacher retention, and the most recent data reflect retention from SY 20-21 school year to SY 21-22. RPS rates refer to staying in or leaving the division which means they do not capture teachers migrating between RPS schools (Bishop, 2022b). Teachers who were fired, retired, or transferred into an administrative role count as not having been retained (Bishop, 2022b).

[5] School-based staff are all RPS staff on a teacher contract in the Master Schedule, including teachers, long-term substitutes, and guidance counselors. No data differentiate classroom teachers from other role because of how they were collected. Using the school-based staff measure could overestimate the teacher count, but my client and I believe that it is counteracted by the push-in special education teachers who were not counted in the metric.

## Client Overview

Richmond Public Schools serves 22,000 students from PK-12 across five preschools, 25 elementary schools, a charter school, seven middle schools, five high schools, and three specialty schools (RPS, n.d.). The diverse student population comprises mostly Black (62.9%) and Hispanic (22.9%) students (full breakdown in Table A1 of Appendix A). The majority (57.9%) of students are economically disadvantaged (VDOE, 2022a)

The division is responsible for creating its policies and implementing state and federal education policies. Grounded in three core values- equity, engagement, and excellence- RPS aims to create opportunities for all students (Richmond Public Schools, n.d.). Dreams4RPS, the community-developed five-year strategic plan, outlines the division's strategic priorities and goals for 2018 through 2023. The strategic priorities are (1) Exciting and Rigorous Teaching, (2) Skilled and Supportive Staff, (3) Safe and Loving School Cultures, (4) Deep Partnership with Families and Communities, and (5) Modern Systems and Infrastructures. Goal Four in Dreams4RPS is to increase overall and subgroup teacher retention to 85% by SY 22-23 (RPS, 2018). Unsurprisingly, the COVID-19 pandemic forcibly disrupted the division's workforce goals.

Multiple offices have a stake in retention initiatives with the heaviest influence coming from the Talent Office. Andrew Bishop, my primary contact, is the Manager of Data and Systems Administration, which is part of the Talent Office. He is responsible for collecting, analyzing, and overseeing retention data.

All retention related decisions are made by RPS administrators, including Superintendent Jason Kamras, and then must be approved by the School Board. The School Board are elected by and accountable to Richmond community residents. Residents also elect the Richmond City Council and Mayor, all of whom are involved in RPS' budgeting process (*FY 24 Superintendent's Proposed Budget*, 2023). In January 2023, the Superintendent proposed the fiscal year 2024 budget and it is undergoing revision processes (*FY 24 Superintendent's Proposed Budget*, 2023).

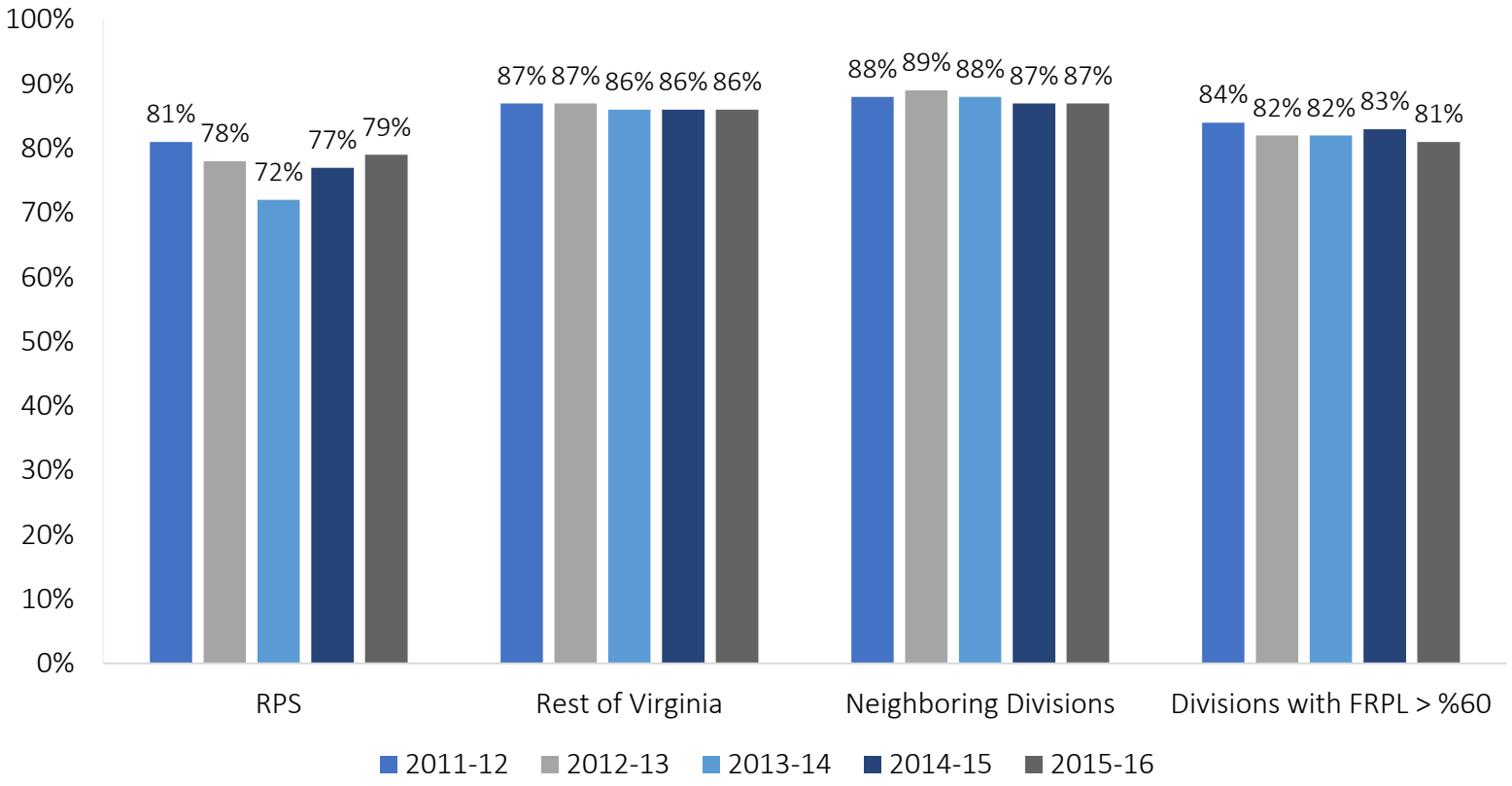
The Richmond Education Association (REA), the collective bargaining organization for RPS staff, also plays a role in division decision-making. The REA is "dedicated to defending and transforming public education for all by improving teaching and learning conditions and protecting the rights of our members" (REA, 2022). RPS became the first division to formally elect the REA as its union representative since the 2021 legislation that re-allowed collective bargaining in Virginia (Dantzler, 2022). The history of collective bargaining and the union in Richmond impact the political salience of retention problem.

## Background on the Problem

The latest data reveal that the retention rate was 79% following the enactment of the 2018 Dreams4RPS plan and continuted increasing through the first school year of the pandemic (83.7%). However, the most recent retention rate 76.1%, which is lower than the baseline year (Bishop, 2022b; Richmond Public Schools, 2018).

Historically, RPS' retention rate was the same or lower than the rest of Virginia (Figure 2 below), neighboring divisions, and divisions with similar rates of students of economically disadvantaged students. The baseline set for Goal Four was the 2016-17 retention rate of 79% (Richmond Public Schools, 2018).

Figure 2: Historic Retention Rates in RPS, Virginia, Neighboring and Similar Divisions




Source: Richmond Public Schools, 2018.

*RPS Data Disaggregated by Race/Ethnicity*

Goal Four aims to improve retention among all subgroups of teacher and retention data were disaggregated by teachers' race/ethnicity (Richmond Public Schools, 2018). The racial/ethnic subgroup trends mirror overall trends in Figure 1 (on page 7). RPS increased teacher retention across all racial/ethnic groups for three years and then experienced a notable decrease in the most recent year (see Figure A1 in Appendix A). (Bishop, 2022b). Table 1 (below) shows the racial/ethnic breakdown of RPS teachers in 2021-22 and retention rate by group (Bishop, 2022b; VDOE, 2022b). In the table, green indicates that the retention rate was higher than pre-pandemic school years and red is for the opposite trend.

Table 1. Percent of RPS Teachers and Retention Rates by Race/Ethnicity in 2021-22 [6]

| Race/Ethnicity | Percent of Teachers | Retention Rate |
|---|---|---|
| Asian | 1.2% | 80.0% |
| Black | 55.4% | 76.4% |
| Hispanic | 3.0% | 70.4% |
| White | 40.3% | 76.5% |

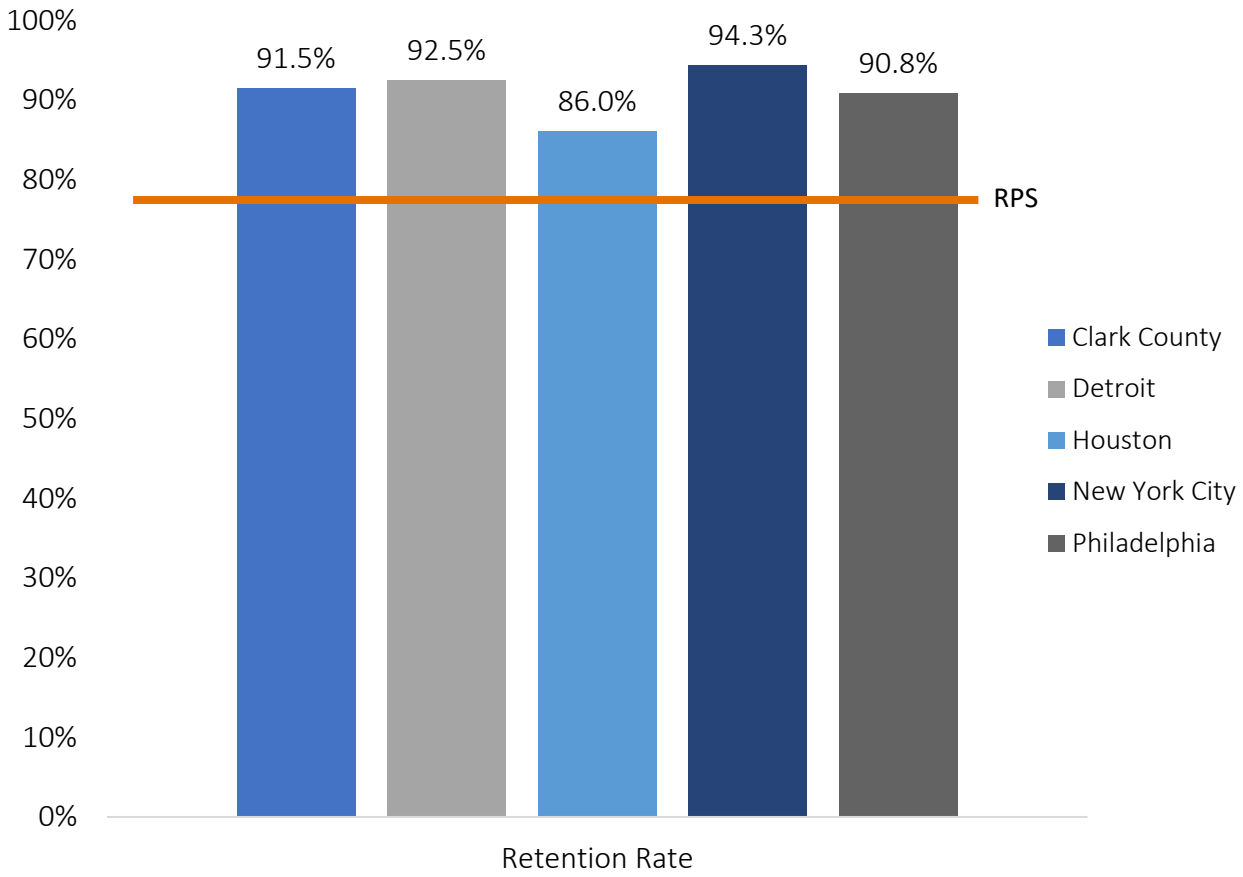
Sources: Bishop, 2022b; VDOE, 2022b.

[6]The RPS-provided racial/ethnic groups for retention are limited. Percentages do not add up to 100% because of rounding.

*Comparison to Urban Districts Across the US*

I located multi-year average retention rates for several large urban districts across the country. While the other districts are much larger and are not perfect matches, they enable another set of comparisons to RPS data. Not all the districts specified whether the rates included retirees. Nonetheless, all have higher retention than RPS by at least eight percentage points. RPS' four-year retention rate was 78.9%, an attrition rate of 21.1%. Figure 3 (below) shows the comparison districts' data with RPS on the orange reference line.

**Figure 3. Multiyear Retention Rates in Urban Districts Across the US**




Note: Districts' data reflect a range of years. Clark County's rate is a six-year average. Detroit, NYC, and Philadelphia's rates are five-year averages. RPS' rate is a four-year average. Houston's rate is a three-year average.

Sources: *Clark County School District Licensed Personnel Separation Report*, 2021; Dantzler, 2022; DPSCD, n.d.; HISD, n.d.; Schatzle, 2022.

## Consequences of the Problem

Addressing teacher turnover requires a multitude of direct and indirect costs. Direct costs are related to recruiting, interviewing, background checking, hiring, and training new teachers. It is difficult to estimate how much losing a teacher costs a district. In 2007 the National Commission on Teaching and America's Future (NCTAF) published a report on the annual cost of turnover. The report estimated that turnover cost Richmond roughly $9.8 million (inflated adjusted to January 2023 dollars) (BLS, 2023; NCTAF, 2007). However, without a teacher count, I cannot extrapolate the per teacher cost from the NCTAF report. Another set of estimates commonly used were produced by Barnes et al.'s (2007) study of turnover costs in five US districts. This report uses Barnes' most conservative estimate for an urban district, $15K, adjusted for inflation to $23.6K per teacher (January 2023 dollars) (Barnes et al., 2007; BLS, 2023).

The largest indirect cost is Human Resources' and administrations' time. The opportunity cost for their time increases as the importance of their other responsibilities rises. Direct financial costs are also opportunity costs because they represent resources that cannot be spent on other initiatives, thus inhibiting progress toward various goals (Holme et al., 2018).

*Student Achievement*

Turnover and student achievement are negatively correlated, with a particularly strong relationship in lower-achieving schools. In a well-known study, Ronfeldt et al. (2013) examined data on 850,000 4$^{th}$ and 5$^{th}$ graders in NYC. They found that students in grades with high teacher turnover scored lower on standardized tests than their peers who experienced less turnover (Ronfeldt et al., 2013). The relationships were particularly strong for Black students and students with lower prior test scores. Ronfeldt et al.'s (2013) findings have been substantiated by studies in different states and populations, suggesting the results are generalizable to various contexts (Hanushek et al., 2016; Ingersoll, 2012; Sorensen & Ladd, 2020).

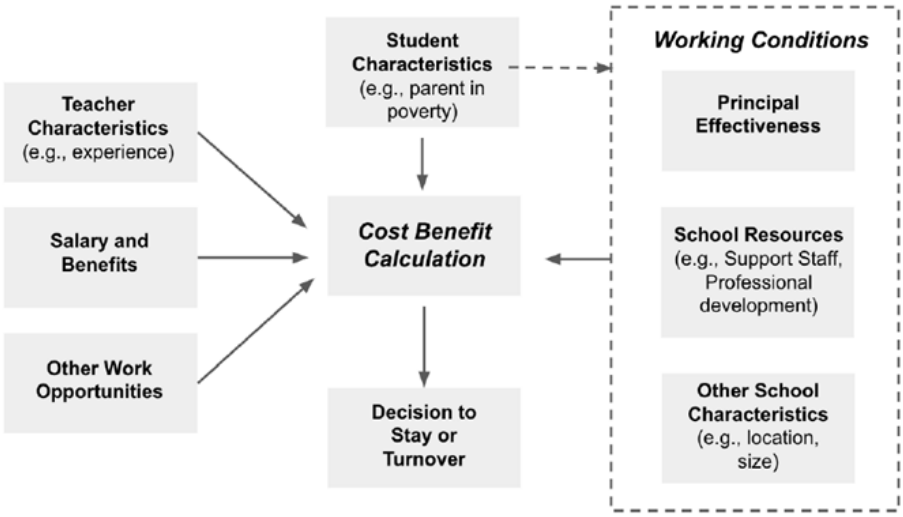
*Institution and Colleagues*

Turnover is negatively associated with school functioning, professional learning, and morale. Guin's (2004) study of a large urban district found a significant negative relationship between turnover and school functioning. Disruptions to school functioning can inhibit teachers' collaboration and professional learning networks, which are related to reductions in morale (Jackson et al., 2009; Ronfeldt et al., 2013). Additionally, before the solutions are enacted, existing teachers must pick up the slack and cover classes for vacancies. This is a potentially large externality for teachers' workload and stress levels, though it may be small to society.

## Evidence on Potential Causes and Solutions

To improve retention and reduce turnover, it is imperative to understand the reasons underlying teachers' decisions. Turnover is a complex problem affected by teachers' personal, school/division, political , and economic factors. Common reasons that teachers offer for turnover are working conditions, dissatisfaction, and low salaries (Boyd et al., 2011; Carver-Thomas & Darling-Hammond, 2017; Guin, 2004; Ingersoll, 2001; Ingersoll & Smith, 2003; Katz, 2018). Research on turnover usually focuses on causes and trends, rather than evaluating the efficacy of interventions. While the literature provides evidence on common reasons teachers leave, it is vital to determine why teachers in each specific context leave to ensure that the intervention addresses the root cause. To this end, many districts seek to collect data on school climate, working conditions, and reasons why their teachers leave. Researchers' recommendations aim to ameliorate the common causes of turnover in addition to better preparing, support, and developing teachers. Figure 4 (below) offers a visual representations of factors in teachers' career decisions.

Figure 4. Grissom's Framework for Teachers' Career Decisions




Source: Grissom, 2011.

In a study of school context and teacher retention in NYC, Boyd et al. (2011) found that 30% of teachers who left their school cited dissatisfaction as their primary motivator. Other research has corroborated this rationale (Carver-Thomas & Darling-Hammond, 2017; Ingersoll, 2001). However, it is difficult to address dissatisfaction itself because it is caused by experiences in and views on schools. The next portion of this section illuminates aspects of teaching related to satisfaction and retention.

*Working Conditions*

Working conditions incorporate numerous aspects of teachers' jobs including administrative support, respect and autonomy, school climate, resources, professional development opportunities, and more. Researchers have consistently found that aspects of working conditions and turnover are significantly related (Boyd et al., 2011; Grissom, 2011; Guin, 2004; Ingersoll, 2001; Kraft et al., 2016; Johnson et al., 2011; Simon & Johnson, 2015). General recommendations address supporting collegial culture and improving administration. Accordingly, administrators should ensure that teachers have time to engage in shared planning, collaboration, and professional learning (Boyd et al., 2011; Podolsky et al., 2016). Alternatively, Podolsky et al. (2016) suggests surveying teachers to gain insights and then developing targeted initiatives to improve working conditions.

Researchers find that support, respect, and autonomy from administrators are related to teachers' career decisions (Boyd et al., 2011; Grissom, 2011; Ingersoll, 2001; Katz, 2018; Kraft et al., 2016). In addition, principal effectiveness is positively associated with teacher satisfaction and negatively associated with the likelihood of teacher turnover (Grissom, 2011). Considering these findings, researchers recommend investing in recruiting and developing high-quality principals (Podolsky et al., 2016). Principals already in schools should receive professional learning that empowers them to improve their effectiveness, support their staff, and transform school culture (Kraft et al., 2016).

Image Source: Shutterstock.

*Financial Incentives*

Teacher salaries are inequitably distributed across districts and states because of funding disparities and single salary schedules (Springer, 2019). Some find that salaries play a role in teachers' career decisions, though the level of influence varies (Carver-Thomas & Darling-Hammond, 2017; Gray & Taie, 2015; Loeb et al., 2005). In a study of California teachers, salaries were predictive of high turnover, although the predictive strength weakened when accounting for student characteristics (Loeb et al., 2005). However, other researchers caution that salary increases may not compensate for poor working conditions (Hanushek et al., 2004 Lankford et al., 2002).

Strategic pay, or targeted financial incentives, are often found to be positively related to teacher retention (Boyd et al., 2011; Cowan & Goldhaber, 2018; Feng & Sass, 2017; Lankford et al., 2002; Marsh et al., 2011; Nguyen et al., 2019; Springer & Gardner, 2010). Types of strategic pay include pay for performance (merit pay), bonuses for working in hard-to-staff schools, bonuses for filling critical subject shortages, and retention bonuses. It should be noted that these incentives are typically targeted towards specific teachers populations, such as high-performing teachers and teachers of color. Instead of targeted incentives, some researchers recommend using creative compensation, such as housing incentives, scholarships, and assistance with loan forgiveness (Boyd et al., 2011; Carver-Thomas & Darling-Hammond, 2017; Feng & Sass, 2017; Podolsky et al., 2016).

Districts interested in utilizing financial incentives should do further research to understand the pros and cons of each financial approach. A noteworthy downside of these approaches are their financial burden, especially for large school districts.  Nonetheless, districts may find financial reforms appealing approach because of their relative ease to implement, in comparison to organizational transformations.

## Relevant Evidence from RPS

The previous section provided a general overview of academic literature. This section connects RPS-specific data to important trends and findings in the literature.

*Teacher and Student Populations*

Greater than a quarter of RPS' teachers were considered vulnerable and more likely to turn over due to less experience and preparation (Carver-Thomas & Darling-Hammond, 2017; Grissom, 2011; Ingersoll et al., 2021, VDOE, 2022c). According to the latest Virginia School Quality report, 5.2% of RPS teachers were teaching out of their field, 5.3% were inexperienced, 1.1% were inexperienced and out of the field, and 15.9% were provisionally licensed (VDOE, 2022c).

RPS' student population aligns with the populations in schools educators tend to leave schools: high-minority and high-poverty (Darling-Hammond & Sykes, 2003; Dee & Goldhaber, 2017; Guin, 2004; Ingersoll et al., 2018, 2021; Rivkin et al., 2005; Strong, 2005).

*Satisfaction*

Given that dissatisfaction with their job, administration, or working conditions are major reasons that teachers leave, the satisfaction of RPS teachers is important to understand (Carver-Thomas & Darling-Hammond, 2017; Guin, 2004; Ingersoll, 2001; Ingersoll & Smith, 2003). RPS annually, except for the 2020-21 school year, administers a satisfaction survey[7] to all teachers, staff, families, and students (Bishop, 2022a). Eighty percent of teachers took the 2021-2022 survey (Bishop, 2022a). The survey is imperfect because the data represent all teacher respondents, not only attritors, yet it still provides insight into RPS teachers' sentiments and concerns. Results from the satisfaction survey match the findings from the MERC survey (Bishop 2022a, 2022b). Less than half of teachers felt they were trusted to make sound professional instruction-related decisions (47%) or said they had sufficient professional development resources (48%) (Bishop, 2022a, 2022b). Just above half of the teachers said their school was a good place to work and learn (53%) or a place they felt safe (56%) (Bishop, 2022a, 2022b).

*Working Conditions*

In the last year, RPS offered the Metropolitan Educational Research Consortium's (MERC) voluntary exit survey to teachers leaving their roles (Bishop, 2022b). While these data are

[7] The survey contains Likert-style prompts with response options ranging from strong disagreement to strong agreement. Respondents must answer at least 75% of answered questions with agree or strongly agree to be considered satisfied. Teachers respond to eight questions about respect, autonomy, safety, and agency.

limited to a single pandemic-affected year and the response rate was low[8], the data provide evidence on why some RPS teachers attrit. The top three reasons teachers left were school context, personal reasons, and division context (Bishop, 2022b). Since the division cannot control "personal reasons", I focus on school and division contexts. The MERC survey defines school context reasons as those related to collegiality, leadership, or other supports (Bishop, 2022b). Division context reasons are related to division policies impacting teachers' work, including workload, resources, and autonomy. The above contextual factors are typically called aspects of working conditions (Bishop, 2022b). As mentioned previously in this report, working conditions are highly predictive of teacher retention (Boyd et al., 2011; Grissom, 2011; Guin, 2004; Ingersoll, 2001; Kraft et al., 2016; Johnson et al., 2011; Simon & Johnson, 2015).

Image Source: Shutterstock.

[8] The MERC exit survey had a low response rate. If RPS had the 2157 teachers needed for 2021-22 and 23.9% were not retained, then 516 teachers should have been given the opportunity to fill out the survey. If all were offered the survey and 114 took it, the response rate was 22.1% (Bishop, 2022b; RPS, 2022b). Probable explanations are that RPS inconsistently offered the survey or teachers opted not to take it.

## Policy Approaches

This section addresses alternative policy approaches that RPS could implement. The three approaches are the planned status quo, principal professional development, and teacher collaboration and development. Each approach considers trends and suggested solutions from the literature, as well as RPS survey results.

RPS operates under a different school (August-June) and fiscal year (July-June). Both are important considerations for the approaches as each must be written into the correct fiscal year budget and then implemented during the school year. In January 2023, Superintendent Jason Kamras proposed the fiscal year 2024 budget and it is currently undergoing revision processes (*FY 24 Superintendent's Proposed Budget*, 2023). Fiscal year 2024 (July 2023-June 2024) is the 2023-2024 school year which is considered year zero. Table 2 (below) contains the timing for each approach and its projected benefits.

Table 2. Timing of Policy Approaches

| Approach | Enacted In | Benefit In |
|---|---|---|
| (1) Status Quo | Year 0 | Years 1-2 |
| (2) Principal Professional Development | Year 1 | Years 2-3 |
| (3) Teacher Professional Development and Collaboration | Years 1-4 | Years 2-5 |

*1. The Planned Status Quo*

The division has plans to enact changes over the next school year (year zero). The Data and Systems Administration Team will administer and analyze a new exit survey in addition to the existing annual Teacher Satisfaction Survey (Bishop, 2022a). Currently, a new Teacher Retention Task Force is currently interviewing teachers about morale (Bishop, 2022b). These surveys and interviews will provide the division with knowledge on teachers' morale, satisfaction, and rationales for leaving which can be used to help the division determine how to best address the root causes of the problem.

For FY 24, RPS budgeted $100K for implementing the Retention Task Force's recommendations (*FY 24 Superintendent's Proposed Budget*, 2023). The division also intends to use $1.37M to improve teacher and principal quality with funds anticipated through Title II of The Every

Student Succeeds Act[9] funding (*FY 24 Superintendent's Proposed Budget*, 2023). Finally, RPS is making financial changes for staff including salary raises, adjustments, and incentives for filling hard-to-staff subject positions (Richmond Public Schools, 2022b).

*2. Principal Professional Development*

Last year less than two-thirds of RPS teachers felt respected by administrators, nearly half agreed they could raise an important issue, and less than half felt they were trusted to make sound professional decisions (Bishop, 2022a). The survey data are concerning considering the academic research that finds that teachers' sense of autonomy and assessment of leadership quality are highly predictive of their retention intentions (Becker et al., 2021; Becker & Grob, 2021; Ladd, 2011). Accordingly, this approach develops principals' leadership capacities and empowers them to transform school culture by providing all principals and a portion of assistant principals with the research-backed McRel Balanced Leadership professional development (Carver-Thomas, 2018; Jacob et al., 2015). The mandatory program, occurring at the beginning of FY 25 (year one), will include a $500 bonus for full participation.

*3. Professional Development and Collaboration for Teachers*

Survey data shows that less than half of RPS teachers felt they had sufficient professional development resources, a factor in teachers' likelihood of attriting (Bishop, 2022a; Simon & Johnson, 2015). This approach addresses those data by providing teachers with job-embedded professional development and collegial support. Decisions would be codified at the division level with programming starting in year 1 (FY 25) due to the timing of budget processes.

RPS would provide all full-time teachers with a collaboration period for job-embedded professional development and collegial support. This approach would occur in FY 25 (year one) and would run through FY 28 (year four).

[9] The Virginia Department of Education (VDOE) receives Title II funds from the US Department of Education and then gives out subgrants to divisions. RPS' Title II applications are submitted to the VDOE.

## Evaluating Approaches

This section assesses each approach using the three criteria: cost-benefit analysis, feasibility, and sustainability. The limited cost-benefit analysis weighs the direct costs against the estimated retention improvements (benefits) of each approach. The status quo, approach one, will be implemented regardless of my recommendation; however, the costs and benefits for the other approaches do not incorporate the status quo calculations.

Feasibility incorporates the practical and political feasibility of getting the approach approved, and then sustainability considers how likely it would be to stay in place long enough for benefits to occur. Appendix B elaborates on each criterion and the ranking system. All criteria are evenly weighted because they represent equally significant considerations.

Appendix C contains calculations and projections for benefits based on literature. Appendix D includes all cost-benefit calculations and associated sensitivity tests for each approach.

### Alternative 1: The Planned Status Quo

Cost-Benefit: *Costs Outweigh Benefits*

I developed the best approximations possible with the data I have. Costs are overestimated and benefits are underestimated for several reasons.

1. The FY 24 budget allocates funds for all staff raises ($15.4M) and does not separate out the portion for teachers (*FY 24 Superintendent's Proposed Budget*, 2023). The academic literature has mixed findings on how salary raises can impact retention, particularly in urban districts with high turnover (Boyd et al., 2011; Guin, 2004; Hough, 2012; Ronfeldt et al., 2013). Last year, just 23% of surveyed RPS attritors (n=114) identified compensation was a top reason for leaving which suggests that salary may not be a driving factor behind the problem, (Bishop, 2022b). Raises could have a small positive effect retention that I cannot presently quantify.

2. There are two types of critical shortage (hard-to-fill subject) bonuses. Both provide half in year zero and the rest, for those who remain, in year two. I do not have data on past total distributions for these bonuses. I estimated that 80% of new hires (to fill 516 vacancies) were eligible for the non-novice ($4000) or novice ($2000) bonuses (Richmond Public Schools, 2022a). I optimistically estimated that 85% of those hires would remain through year two to receive the rest of the bonus. The estimated benefits of these bonuses are based on a study of critical shortage bonuses (Feng & Sass, 2017).

3. I do not know how RPS intends to spend Title II funds. Instead, I estimate the share of Title II funding that may be used in ways that could improve retention. I used the FY 23 breakdown of the broad Title II spending categories from a School Board meeting record and calculated the share of funds for each category (Harrison, 2022). I applied those percentages to the FY 24 funds budgeted and found that 87% may be spent in ways that could improve retention.

As the initiatives for this approach overlap, I expect the benefits will as well. Instead of adding benefits, I averaged them for year one and included half of that average for year two, assuming effects will fade over time. The outcomes matrix contains the most conservative outcome. In all scenarios, estimated costs outweighed benefits. See Tables D1 and D2 in Appendix D for details.

Feasibility: *Medium-High*

This approach has a medium practical feasibility because it places a high human capital burden on the Talent Office, specifically the people on the Teacher Retention Task Force and the Data/Systems Management teams. The non-financial costs are concentrated among the above teams, yet they would only be impacted by potential benefits after retention improves. The more immediate benefits would be diffused across teachers. Politically, this approach is highly feasible. It aligns Dreams4RPS Strategic Plan, would likely be supported by the teacher's union, and is already being reviewed by Board (Richmond Public Schools, 2018). On a broader scale, improving retention is an expressed state priority in multiple government branches meaning there is alignment across several institutions. Overall, this approach has medium-high feasibility.

Sustainability: *Medium*

This approach has medium sustainability. It is financially expensive and requires multiple funding streams, which are opportunities for it to fall apart. However, it is only planned for one year, thus it does not need to be sustainable long term. Second, the bulk of the human capital required for this approach to work is front-loaded and will occur to get it enacted, rather than to maintain it. Finally, there could be political opponents to the spending. I do not believe opposition would be able to completely quash this approach because the budget is already proposed, public opinion tends to support teacher retention, and spending aligns with division priorities.

## Alternative 2: Principal Professional Development

Cost-Benefit*: Benefits Outweigh Costs*

Using a quote I found for another district ($23.5K/40 people), I estimated the cost of this approach scaled up for 80 people so that all principals and some assistant principals can attend (Taylor, 2022). Assumed for the above estimate is that the program would cost twice as much for twice as many people, which may not be true. Additionally, I included two hours of one-on-one virtual coaching follow-ups per participant and a $500 bonus per participant for attending all sessions. All costs occur in year one.

Jacob et al. (2015) found that participation in the BL program reduced school turnover by seven percentage points. Unfortunately, they did not provide a baseline turnover rate, so I was unable to calculate a percentage that could be applied to RPS data to estimate the impact for the division. Based on the intent of the BL program, I anticipate improvements to administrative support, teachers' feelings of autonomy, and the faculty's sense of influence in decision making. Accordingly, I applied relevant estimates from studies by Kraft et al. (2016) and Ingersoll et al. (2011) to RPS data. Ingersoll's estimates apply to either White or Minority teachers, so the projected benefits are applied to the turnover statistics for each population. Because turnover rates are calculated using data on who returns from school year to school year, benefits are projected into the future. Administrative support and leadership improvement could occur in year two and the remainder would be in year three. The most conservative estimate is in the outcomes matrix. In all tested scenarios, benefits outweighed costs. See Tables D3 and D4 in Appendix D for details.

Feasibility: *Medium-High*

This approach has high practical feasibility because the purchased program includes trained guides, resources, and most other supplies needed. It would require little human capital capacity or time to set up or run. Politically, it would need to be approved by the School Board, although the opposition I anticipate is from principals and perhaps the teachers' union. There is a chance those groups would feel it places too much of a burden on principals. In this case, the non-financial costs are almost solely on principals and the benefits are diffuse. To reduce the opposition's concerns, the program would occur between school years so that principals have fewer requests, more time, and are able to plan changes before teachers return. Additionally, those who attend all sessions would receive a $500 bonus to ease potential opposition to the mandatory professional development program. The political feasibility is ranked as medium, making this approach have medium-high feasibility.

Sustainability: *High*

This approach is highly sustainable because it is short-term, requires little human capital, and involves a relatively small group of people. The opposition I anticipate is relevant in the political feasibility of getting it approved, but there is not much room for opposition to dismantle it once it is enacted because the program occurs over a very short time frame. Overall, this approach is highly sustainable.

## Alternative 3: Teacher Collaboration and Professional Development

Cost-Benefit: *Benefits Outweigh Costs*

The most substantial costs of this initiative would be the associated with ensuring all teachers have a period for collaboration and development. It is possible that by reserving an extra period a day per teacher, there could be additional teachers or classrooms needed but I cannot say without further data. Consequently, the total costs for this approach will be underestimated.

For the cost professional development, I added the staff development items from the FY 24 budget to the Title II approximations, divided by the number of teachers, and rounded up to $200 to account for uncertainty (Harrison, 2022; Richmond Public Schools, 2022b, p. 23). For this initiative I would not increase development funds for year one as there would be significant schedule changes occurring. In years two through four, RPS would budget $300 per teacher (~$100 more than now) which is in the cost section for 2157 teachers.

The professional development programming itself could differentially affect teachers and their career decisions. The intent of programming would be to allow for more personalized professional development and collegial collaboration, thus there is no standard benefit I can realistically apply to all teachers. Instead, the benefits for this approach are derived from estimates of the effect of improving teacher relationships/collaboration and autonomy/influence on the likelihood of turnover (Kraft et al., 2016; Ingersoll et al., 2011). I anticipate that the benefits from teacher relationships/collaboration would occur in years two through five, and the benefits from autonomy/influence would occur in years three through five. I do not believe that autonomy/influence would increase the same amount each year because there is likely to be a gradual improvement at first and then a plateau. The year three benefit is 25% of potential benefits, year four is 75%, and year five is another 25%. The most conservative estimate is in the outcome matrix. In the actual estimate and one sensitivity test, benefits outweigh costs, although in the final sensitivity test the costs overwhelm benefits. See Tables D5 and D6 in Appendix D for details.

Feasibility: *Low*

This requires the most human capital and time because there would need to be a division-wide rearrangement of schedules, creation of new school day plans, determination of the true cost of new schedules, and time-intensive planning of professional development within each school. Due to the above requirements, this approach has low practical feasibility. The approach politically aligns with division and state priorities. Non-financial costs are concentrated among management (administrators and Central Office teams), while benefits are distributed across

teachers. The teachers' union and teachers would likely be supporters, while administrators and whomever creates master schedules could be vocal opposition. As the opposition parties have more power than the supporters, this approach would require significant coordination and consensus building efforts. This approach has low political and overall feasibility for those reasons.

Sustainability: *Low*

The sustainability for this approach is low because it requires significant coordination to enact and maintain it. Every year it would need to be refunded and there would need to be ongoing professional development planning, which could require additional staff. I believe it could be overturned relatively easily by opposition within the administration or Central Office because of its labor intensiveness.

## Figure 5. Evaluation Matrix

| Criteria | Planned Status Quo | Principal Development | Teacher Development + Collaboration |
|---|---|---|---|
| Limited Cost-Benefit Analysis | 1 Costs > Benefits -$18.5M | 5 Benefits > Costs $3.9M | 5 Benefits > Costs (Except in final sensitivity test) $3.5M |
| Feasibility | 4 Medium-High | 4 Medium-High | 1 Low |
| Sustainability | 3 Medium | 5 High | 1 Low |
| Total Score | 8 | 14 | 7 |

## Recommendation

RPS seeks to improve teacher retention as swiftly and financially responsibly as possible. The division will be enacting at least portions of the planned status quo in FY 24 and will hopefully see improved retention. My recommendation is in addition to the planned status quo, thus there are no tradeoffs between the two approaches.

I suggest enacting the principal professional development in FY 25. This approach sees principals as an access point for school improvement that will have broader effects. The recommended program will provide fewer upfront direct benefits to teachers, in comparison to the teacher development approach. On the other hand, it should help school leaders and encourage them to use distributive leadership in their schools; consequently, I expect there could be improvements to school contexts and teacher satisfaction, both of which are predictive of teacher retention. Changes to teachers' working conditions and satisfaction will make them less likely to leave, and retention will improve.

The principal development program is easily scaled up to train all assistant principals or down to only principals, if necessary. My analysis found that program benefits outweigh the costs across all discount rates and sensitivity tests. As the program is short-term and does not require much human capital from the division, it should be relatively uncontroversial to enact and sustain.

## Implementation

The McRel Balanced Leadership Program will be implemented in year one with lagged benefits experienced in years two and three. Most implementation steps are related to obtaining approval from the Superintendent to offer the program to principals and then going through the budgeting process to get the program funded. Implementation will occur in years zero and one.

*The Process and Stakeholders*

All steps and their chronology are outlined in Figure 6, the implementation timeline (on page 27). The Talent Office is the team primarily involved in setting up and implementing the program at the beginning of the fiscal year 25 (July 2024).

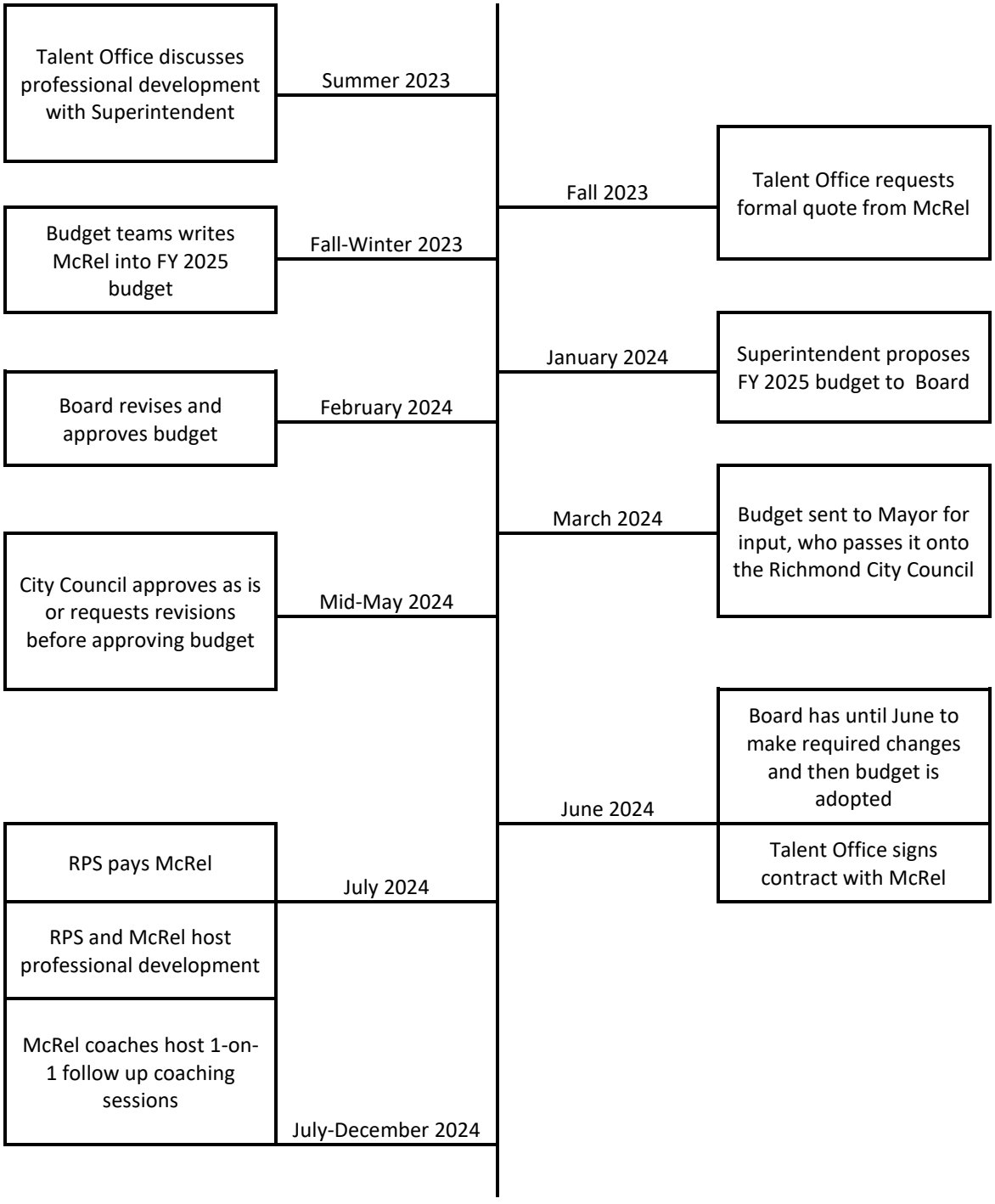
First, they will set up a meeting with Superintendent Jason Kamras in the summer of 2023 to discuss how the approach can benefit RPS. They will need to present information about the costs, benefits, and intentions of the program to get Superintendent Kamras on board. I expect he will be supportive of doing the program as it has the potential to positively affect principals, schools, teachers, and it will save the division money. A major point that needs to be emphasized is that

the program requires little financial or time costs, and yet it could significantly ameliorate the division's retention problem. Once the Superintendent agrees to the program, the Talent Office will request a formal quote from McRel to run the development for 80 participants. They will ask McRel to provide additional details that will be used to bolster their arguments for why RPS should use the program which can be utilized if they face resistance in the budgeting process.

The next chunk of steps are parts of the budget process based on the steps outlined in the FY 24 proposed budget (*FY 24 Superintendent's Proposed Budget*, 2023). The team writing the budget will need to incorporate BL in the budget proposal as a specific line item under professional development. This will occur in fall or winter of 2023 in anticipation of the Superintendent proposing a budget to the School Board in January 2024. In February 2024, the Board will revise the budget, hold public hearings, and then approve it. I expect support from the Board for the same reasons as the Superintendent. This is the time during which there could be pushback from principals, the Richmond Education Association (REA), or the community. Principals may be resistant because they do not want to attend another professional development session or see it as an attack on their efficacy. To mitigate principals' resistance, BL should be framed to help principals, their staff, and their schools, rather than fix principals. Additionally, participants who attend all mandatory sessions will receive a $500 bonus Although the REA (the employees' union) or the community could resist with principals, I expect they will be in favor of the initiative as it could positively transform teachers' and students' experiences in RPS schools. Once the Board approves the budget, they will send it to the Mayor in March 2024. The RPS budget will be over $500M, thus I do not expect the BL program will be cut to reduce spending as it is a small expenditure (~$170K). The mayor will approve the budget and send it to the final group, the Richmond City Council, in April of 2024. I believe that, if the BL program has made it through the Mayor, the City Council will be in favor of the program. The City Council will either approve the budget as is or request revisions before they can sign off on it by June 2024 at the latest.

Once the Mayor approves the budget, in March 2024, the Talent Office will formally sign a contract with McRel and then coordinate with facilities to set up a time and location for the sessions. As I do not anticipate the City Council will remove the program, it is better for there to be a contract signed with McRel sooner rather than waiting until June. RPS will pay McRel July 1, 2024, on the first day of the fiscal year 2025. RPS and McRel will jointly host the BL sessions in July 2024. McRel coaches will schedule two one-on-one follow ups per attendee for the fall or winter of 2024. After BL is held, principals and assistant principals will begin implementing and preparing to announce any changes to their staff at the beginning of the 2024-2025 school year. They will continually implement techniques and processes learned at BL and will be supported by McRel coaches.

## Figure 6. Implementation Timeline



## Conclusion

Teachers are a vital school-based factor in students' academic achievement and life outcomes (Chetty et al., 2014; Goldhaber et al., 1999; Hanushek, 2011; Jackson, 2018; Opper, 2019; Rivkin et al., 2005; Rockoff, 2004). Optimizing students' futures and the future of education necessitates developing and maintaining a high-quality teacher work; however, teachers' career considerations may drive them to leave their school or the career entirely. This turnover, or lack of retention, is a significant obstacle. Teacher turnover harms students, teachers, schools, and districts in various ways (Barnes et al., 2007; Guin, 2004; Jackson et al., 2009; National Commission on Teaching & America's Future, 2007; Ronfeldt et al., 2013).

This report proposed and evaluated three research-based approaches with the potential to reduce teacher turnover: the planned status quo, principal professional development, and teacher professional development and collaboration. Portions of the planned status quo are already being enacted, so my recommendation is in addition to those decisions.

Principal professional development can improve principals' leadership capabilities, their schools' cultures, and, consequently, teachers' working conditions in schools– all factors related to teachers' decisions to stay or leave their positions (Boyd et al., 2011; Grissom, 2011; Guin, 2004; R. M. Ingersoll, 2001; Johnson et al., 2011; Kraft et al., 2016, p. 20; Podolsky et al., 2016; Simon & Johnson, 2015).

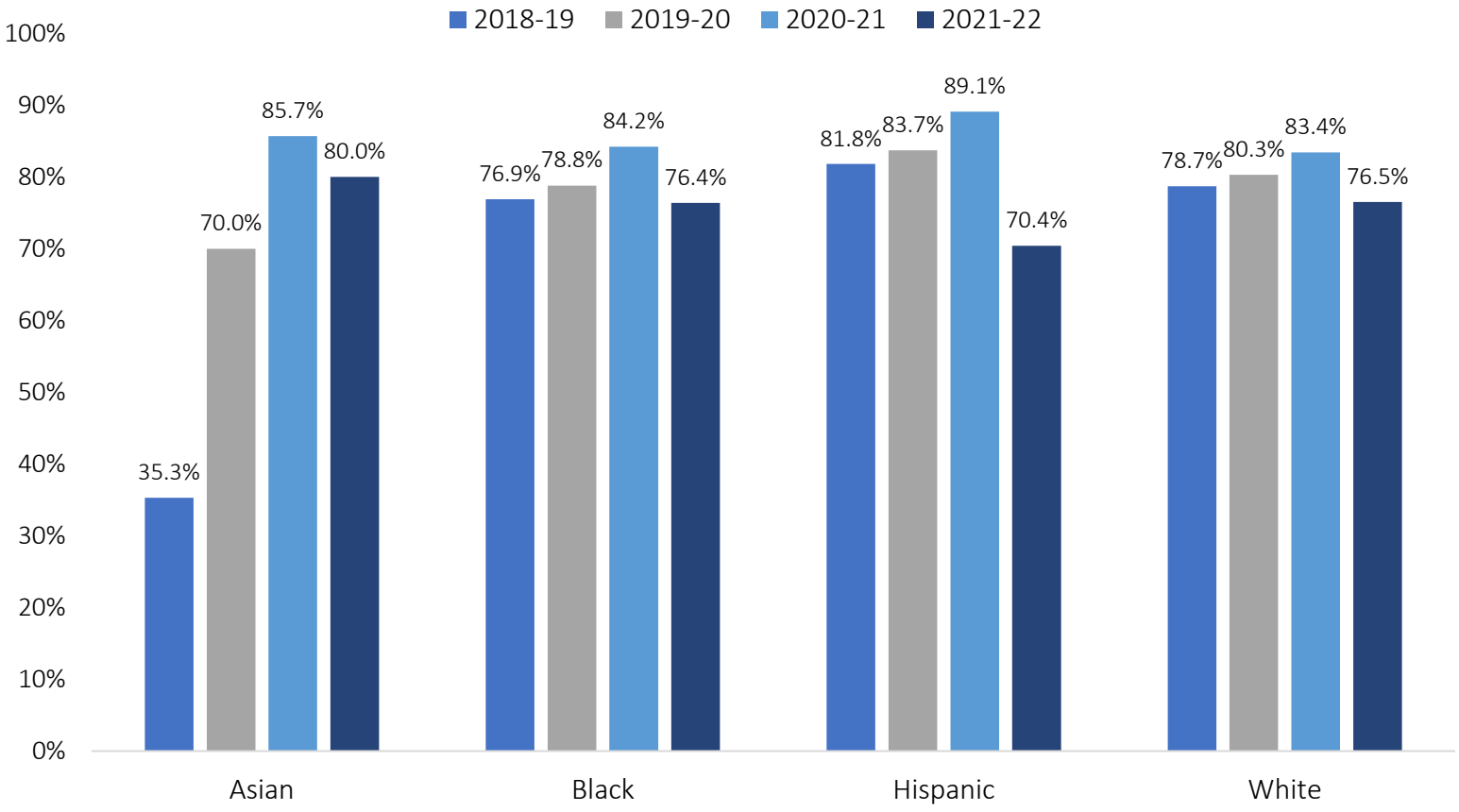
## Appendix A: Supplemental Visuals

**Table A1. SY 21-22 Student Population Disaggregated by Race/Ethnicity**

| Race/Ethnicity | Count | Percent of Student Population |
|---|---|---|
| American Indian or Alaska Native | 39 | 0.18 |
| Asian | 160 | 0.76 |
| Black, non-Hispanic | 13,323 | 62.91 |
| Hispanic | 4,857 | 22.93 |
| Native Hawaiian or Pacific Islander | 14 | 0.07 |
| 2+ race, non-Hispanic | 520 | 2.46 |
| White, non-Hispanic | 2,266 | 10.70 |

Source: VDOE, 2022a. Return to Problem Statement

**Figure A1. RPS' Multiyear Retention by Teachers' Race Ethnicity**




Source: Bishop, 2022b. Return to Background

# Appendix B: Evaluative Criteria

## Ranking/Points System

For the first criterion, if costs outweigh benefits it is ranked as low and worth one point. If benefits outweigh costs, it is high and worth five points. I chose the dichotomous ranking system to keep the cost-benefit result comparisons simple. If I were to assign five points to the approach with the largest benefit (principal development) and then less to the next best approach (teacher collaboration and development), my overall recommendation would not change because of the point differences from the other criteria.

For feasibility, the low level represents one point, low-medium is two points, medium is three points, medium-high is four-points, and high is five points; sustainability is ranked as low, medium, or high and the point values for those correspond with the points used for feasibility. The feasibility and evaluation matrices are color-coded with low as red, low-medium as orange, medium as yellow, medium-high as yellow-green, and high as green.

## Limited Cost-Benefit Analysis

This criterion includes the estimated direct financial costs and benefits of each approach. None of the projections or estimations are without error. Costs are estimates of what the division would pay to implement an approach, based on RPS budgets and extra documentation I found through research. Benefits are the savings that would occur due to the projected reductions in turnover. When possible, turnover effects found in the academic literature are applied to RPS data to find an estimated projected change for RPS. Research estimates do not map perfectly to RPS data because most studies looked at school-level turnover and RPS data is at the division level. The projections are the best that can be done given data limitations.

All financial estimates are in January 2023 dollars. Past costs have been adjusted for inflation using the Bureau of Labor Statistics' CPI Inflation Calculator (BLS, 2023). Future costs and benefits were adjusted for 3% future inflation and discounted at 3% and 7% as a sensitivity check. Adjustments for inflation and discounting are present in calculations in Appendix D. Cost-benefit calculations extend through year five (FY 29 or July 2028). As sensitivity tests for each cost-benefit calculation, I adjusted each to see if my overall judgment of the approach would change. All back of envelope calculations are in Appendix C and cost-benefit calculations are in Appendix D. As the settings, outcomes, and costs vary by approach, I describe assumptions, flaws, and extrapolations in the relevant sections.

RPS needed 2157 teachers in 2021-22 (Richmond Public Schools, 2022b). If every spot was filled and 76.1% were retained, 516 teachers were not retained which cost the division roughly $13.43M (Barnes et al., 2007; Bishop, 2022b; BLS, 2023). I consider the latest RPS turnover rate of 23.9% as the baseline odds of a teacher leaving the division. For estimates that apply to specific teacher populations, I use those turnover rates as the baseline instead (Bishop, 2022b). Table B1 (below) includes the baselines for all teachers, White teachers, and Black teachers.

Table B1. Baseline Turnover and Costs

| Baseline | Cost Per Teacher (Jan. 2023 $) | Turnover Rate (Odds of Turnover) | # Teachers Lost | Cost |
|---|---|---|---|---|
| Baseline All Teachers | $23.6K | 23.9% | 516 | $13,427,166 |
| Baseline White Teachers (40% of population=870 teachers) | | 23.5% | 204 | $5,320,124 |
| Baseline Black Teachers (55% of population=1186 teachers) | | 23.6% | 280 | $7,283,353 |

Source: Bishop, 2022a; VDOE, 2022b.

Feasibility

Practical feasibility assesses the division's likelihood of taking up an approach considering the level of human capital and effort needed. Political feasibility considers the values and priorities of the Virginia Department of Education, School Board, and local community. I rank each approach as low, medium, or high based on conversations with my client, knowledge of local dynamics, the distribution of non-financial costs and benefits, and research. Low means I anticipate significant pushback or resistance, medium means there is potential for pushback or resistance, and high means I do not anticipate any issues and believe the client would readily adopt the alternative. Then I combine the two aspects, resulting in each approach ranked as low, low-medium, medium, medium-high, or high. Below, Table B2 shows how combinations of feasibility levels result in a final ranking.

Table B2. Feasibility Matrix

| | *Low Political* | *Medium Political* | *High Political* |
|---|---|---|---|
| *High Practical* | Medium | Medium-High | High |
| *Medium Practical* | Low-Medium | Medium | Medium-High |
| *Low Practical* | Low | Low-Medium | Medium |

Sustainability

Retention has been an ongoing issue that will likely require multiple changes over time to improve in a lasting way, therefore each approach's sustainability must be assessed. Sustainability is how easy and how likely I believe it would be for the division to continue implementing the alternative over time. In other words, if it were enacted, would it stay in place? I rank each approach as having low, medium, or high sustainability based on conversations with my client, human capital requirements, budget considerations. Factors considered include the number of opportunities opposition would have to overturn it, how politically viable it would be long term, and how likely it would be to be continually funded for the approach to occur as planned.

## Appendix C: Projecting Benefits from Literature

### Table C1. Applying Percent and Marginal Percentage Point Changes to RPS

| Research | Calculations | New Turnover Rate |
|---|---|---|
| 11% reduction in turnover from leadership change (Kraft et al., 2016) | [(X-23.9)/23.9]*100=11 | 21.27% |
| 25% reduction in turnover from school context wide change (Kraft et al., 2016) | [(X-23.9)/23.9]*100=25 | 17.93% |
| .7 percentage point change at 10th percentile and 50th percentile (teacher relationships + collaboration measure) with 15.1% baseline turnover (Kraft et al., 2016) | [(14.4-15.1)/15.1]*100=4.64%<br>[(14.4-15.1)/15.1]*100=4.64%<br>[(14.5-15.1)/15.1]*100=3.97%<br><br>(4.64 + 4.64 + 3.97)/3 = 4.42 | 22.84% |
| .6 percentage point change at 90th percentile (teacher relationships and collaboration measure) with 15.1% baseline turnover (Kraft et al., 2016) | 23.9 *.0442=1.06<br><br>23.9-1.06=22.84 | |
| 8.9% reduction in probability of leaving for MS and HS science teachers (Feng & Sass, 2017) | 23.9*.089=2.13<br><br>23.9-2.13=21.8 | 21.8% |
| 10.84% reduction in leaving in probability of leaving for MS and HS math teachers (Feng & Sass, 2017) | 23.9*.1084=2.59<br><br>23.9-2.59=21.3 | 21.3% |

### Table C2. Applying Odds Changes to RPS (Ingersoll et al., 2011)

| Research | Calculations | Results |
|---|---|---|
| Faculty influence 37% decrease in odds of minority teacher departing | (37 + 40)/2= 38.5%<br><br>23.6* .385=9.09<br><br>23.6-9.09=14.51 | 14.51%<br>for Black teachers |
| Teacher autonomy 40% decrease in odds of minority teacher departing | | |
| Administrative support 21% decrease in odds of White teacher departing | 23.5*.21= 4.94<br><br>23.5-4.94=18.56 | 18.56%<br>for White teachers |

Table C3. Title II Calculations (Harrison, 2022)

| Category | Last Year | % of Total | Applying Percentage to This Year's Total ($1.37M) |
|---|---|---|---|
| Personnel and benefits | $1,235,797 | 86.85 | $1,189,845 |
| Teacher+ leader professional development | $7,207 | .51 | $6,897 |
| Other | $179,837 | 12.64 | $173,168 |
| Total | $1,422,842 | 100 | $1,370,000 |

Table C4. Project Benefits Applied to RPS Data

| Research Impact | Turnover Rate (Turnover Odds) | Teachers Still Lost | Percentage Point Change | More Teachers Retained | Benefit | New Cost |
|---|---|---|---|---|---|---|
| Leadership Improvement [11%] (Kraft et al., 2016) | 21.27% | 459 | 2.63 | 57 | $1,476,184 | $11,950,982 |
| School Wide Context Improvement [25%] (Kraft et al., 2016) | 17.93% | 387 | 5.97 | 129 | $3,353,688 | $10,073,478 |
| Teacher Relationships + Collaboration [4.4%] (Kraft et al., 2016) | 22.84% | 493 | 1.06 | 23 | $594,964 | $12,832,202 |
| Hard to fill bonus for math teachers [10.8%] (Feng & Sass, 2017) | 21.30% | 459 | 2.59 | 57 | $1,470,821 | $11,956,345 |
| Hard to fill bonus for science teachers [8.9%] (Feng & Sass, 2017) | 21.80% | 470 | 2.13 | 46 | $1,184,583 | $12,242,583 |
| Average of Faculty Influence + Teacher Autonomy (Minority teachers*) [38.5%] (Ingersoll et al., 2011) | 14.51% | 172 | 9.09 | 108 | $2,807,631 | $4,475,722 |
| Admin Support (White teachers*) [21%] (Ingersoll et al., 2011) | 18.56% | 161 | 4.94 | 43 | $1,118,358 | $4,201,766 |

# Appendix D: Cost-Benefit Calculations by Approach

## The Planned Status Quo

### Table D1. Cost-Benefit for Planned Status Quo

| Estimated Cost/Benefit | Year 0 | 1 | 2 | 3 | 4 | 5 | Total |
|---|---|---|---|---|---|---|---|
| Retention Fund | -$100,000 | | | | | | |
| Title II funds for improving effectiveness | -$1,196,000 | | | | | | |
| All staff raises for FY 24 *(cannot isolate teachers)* | -$15,400,000 | | | | | | |
| Annual salary adjustment for subset of staff | -$3,500,000 | | | | | | |
| Hard to fill bonuses for non-novices part 1 (paid after 90 days) | -$412,000 | | | | | | |
| Hard to fill bonuses for novices part 1 (paid after 90 days) | -$206,000 | | | | | | |
| Hard to fill bonuses for non-novices part 2 (85% retained) | | | -$310,000 | | | | |
| Hard to fill bonuses for novices part 2 (85% retained) | | | -$155,000 | | | | |
| First year benefits are average of : | | $1,871,319 | | No costs or benefits | | | |
| (1) Leadership Improvement [11%] (Kraft et al., 2016) | | | | | | | |
| (2) School Wide Context Improvement [25%] (Kraft et al., 2016) | | | | | | | |
| (3) Hard to fill bonus for math teachers [10.84%] (Li & Sass, 2017) | | | | | | | |
| (4) Hard to fill bonus for science teachers [8.9%] (Li & Sass, 2017) | | | | | | | |
| 2nd year benefits: 50% of first year benefit | | | $935,660 | | | | |
| Retention fund changes (not planned yet) | | no estimate | | | | | |
| Raises | | no estimate | | | | | |
| **NPV with 3% discount factor and 3% inflation applied (in $Jan 2023)** | -$20,814,000 | $1,871,319 | $470,660 | | | | **-$18,472,021** |
| **NPV with 7% discount factor applied and 3% inflation applied (in $Jan 2023)** | -$20,814,000 | $1,801,363 | $436,128 | | | | **-$18,576,509** |

### Table D2. Sensitivity Tests for Planned Status Quo

| Actual | 3% Discount Rate/3% Inflation | 7% Discount Rate/3% Inflation |
|---|---|---|
| Cost | -$21,279,000.00 | -$21,244,883.48 |
| Benefit | $2,806,978.86 | $2,668,374.73 |
| | -$18,472,021 | -$18,576,509 |

Test 1

| Changes | 3% Discount Rate/3% Inflation | 7% Discount Rate/3% Inflation |
|---|---|---|
| Cost decreased by 25% | -$15,959,250 | -$15,933,663 |
| Benefit increased by 50% | $4,210,468 | $4,002,562 |
| | -$11,748,782 | -$11,931,101 |

Test 2

| Changes | 3% Discount Rate/3% Inflation | 7% Discount Rate/3% Inflation |
|---|---|---|
| Cost decreased by 50% | -$10,639,500 | -$10,622,442 |
| Benefit increased by 75% | $4,912,213 | $4,669,656 |
| | -$5,727,287 | -$5,952,786 |

Return to Evaluation of Planned Status Quo

## Principal Development

### Table D3. Cost-Benefit for Principal Development

| Estimated Cost/Benefit | Year 0 | 1 | 2 | 3 | 4 | 5 | Total |
|---|---|---|---|---|---|---|---|
| McRel Balanced Leadership Professional Development | | -$48,636 | | | | | |
| One on one coaching (2 hrs per participant) | | -$85,267 | | | | | |
| Financial incentives for principals/assistant principals to attend (500 each/80 people) | | -$40,000 | | | | | |
| Average benefit from: | No costs or benefits | | $1,297,271 | | No costs or benefits | | |
| (1) Leadership Improvement [11%] (Kraft et al., 2016) | | | | | | | |
| (2) Administrative Support (for White teachers*) [21%] (Ingersoll et al., 2011) | | | | | | | |
| Average of Faculty Influence and Teacher Autonomy (for minority teachers*) [38.5%] (Ingersoll et al., 2011) | | | | $2,807,631 | | | |
| Expenses for operating building for PD week | | no estimate | | | | | |
| **NPV with 3% discount factor and 3% inflation applied (in $Jan 2023)** | | -$173,903 | $1,222,802 | $2,569,380 | | | **$3,618,279** |
| **NPV with 7% discount factor applied and 3% inflation applied (in $Jan 2023)** | | -$167,402 | $1,202,092 | $2,504,381 | | | **$3,539,071** |

### Table D4. Sensitivity Tests for Principal Development

| Actual | 3% Discount Rate/3% Inflation | 7% Discount Rate/3% Inflation |
|---|---|---|
| Cost | -$173,903.00 | -$167,401.95 |
| Benefit | $4,104,902.00 | $3,706,472.54 |
| | $3,930,999.00 | $3,873,874.50 |

Test 1

| Changes | 3% Discount Rate/3% Inflation | 7% Discount Rate/3% Inflation |
|---|---|---|
| Cost increased by 25% | -$217,378.75 | -$209,252.44 |
| Benefit decreased by 25% | $3,078,676.50 | $2,779,854.41 |
| | $3,296,055.25 | $2,989,106.85 |

Test 2

| Changes | 3% Discount Rate/3% Inflation | 7% Discount Rate/3% Inflation |
|---|---|---|
| Cost increased by 50% | -$260,854.50 | -$251,102.93 |
| Benefit decreased by 75% | $1,026,225.50 | $926,618.14 |
| | $1,287,080.00 | $1,177,721.07 |

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## Teacher Development and Collaboration

### Table D5. Cost-Benefit for Teacher Development and Collaboration

| Estimated Cost/Benefit | Year 0 | 1 | 2 | 3 | 4 | 5 | Total |
|---|---|---|---|---|---|---|---|
| Year 1 Professional development at baseline spending | No costs or benefits | -$431,400 | | | | | |
| Year 2 PD (300/teacher) | | | -$647,100 | | | | |
| Year 3 PD (300/teacher) | | | | -$647,100 | | | |
| Year 4 PD (300/teacher) | | | | | -$647,100 | | |
| Year 2 Teacher Relationships + Collaboration [4.42%] (Kraft et al., 2016) | | | $594,964 | | | | |
| Year 3 Teacher Relationships + Collaboration [4.42%] (Kraft et al., 2016) | | | | $594,964 | | | |
| Year 4 Teacher Relationships + Collaboration [4.42%] (Kraft et al., 2016) | | | | | $594,964 | | |
| Year 5 Teacher Relationships + Collaboration [4.42%] (Kraft et al., 2016) | | | | | | $594,964 | |
| Year 3 Avg of Faculty Influence + Teacher Autonomy (minority teachers*) [38.5%] (Ingersoll et al., 2011) | | | | $701,908 | | | |
| Year 4 Avg. of Faculty Influence + Teacher Autonomy (minority teachers*) [38.5%] (Ingersoll et al., 2011) | | | | | $2,105,723 | | |
| Year 5 Avg. of Faculty Influence + Teacher Autonomy (minority teachers*) [38.5%] (Ingersoll et al., 2011) | | | | | | $701,908 | |
| Cost of rearranging schedules to allow for collaboration period | | no estimate | | | | | |
| Human capital hours re-scheduling and addressing issues | | no estimate | | | | | |
| **NPV with 3% discount factor and 3% inflation applied (in $Jan 2023)** | | -$431,400 | -$52,136 | $649,772 | $2,053,587 | $1,296,872 | **$3,516,695** |
| **NPV with 7% discount factor applied and 3% inflation applied (in $Jan 2023)** | | -$415,273 | -$48,311 | $579,590 | $1,763,303 | $1,071,925 | **$2,951,234** |

### Table D6. Sensitivity Tests for Teacher Development and Collaboration

| Actual | 3% Discount Rate/3% Inflation | 7% Discount Rate/3% Inflation |
|---|---|---|
| Cost | -$2,372,700.00 | -$2,147,732.48 |
| Benefit | $5,889,394.51 | $5,098,966.58 |
| | $3,516,694.51 | $2,951,234.10 |

Test 1

| Changes | 3% Discount Rate/3% Inflation | 7% Discount Rate/3% Inflation |
|---|---|---|
| Cost increased by 25% | -$2,965,875.00 | -$2,684,665.59 |
| Benefit decreased by 25% | $4,417,045.88 | $3,824,224.94 |
| | $1,451,170.88 | $1,139,559.34 |

Test 2

| Changes | 3% Discount Rate/3% Inflation | 7% Discount Rate/3% Inflation |
|---|---|---|
| Cost increased by 50% | -$3,559,050.00 | -$3,221,598.71 |
| Benefit decreased by 75% | $1,472,348.63 | $1,274,741.65 |
| | -$2,086,701.37 | -$1,946,857.07 |

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