Western MA Per Pupil Expenditure Report

With selected districts for comparison

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Appendix A. Data Sources & Calculation Methodology

1. Data sources

Expenditure dataset

Massachusetts Department of Elementary and Secondary Education (DESE)
District Expenditures by Spending Category
Last updated: August 7, 2026
URL: https://educationtocareer.data.mass.gov/Finance-and-Budget/District-Expenditures-by-Spending-Category/er3w-dyti/

This dataset provides:

- Expenditures Per Pupil by category for all Massachusetts school districts
- Student enrollment (In-District FTE, Out-of-District FTE, Total FTE)
- Annual End-of-year-report (EOYR) data from FY2009 to present

Chapter 70 District Profiles

Massachusetts Department of Elementary and Secondary Education (DESE)
Chapter 70 District Profiles
Retrieved: September 2025
URL: https://www.doe.mass.edu/finance/chapter70/default.html
From the Ch70 website: "Chapter 70 District Profiles: The on-line Chapter 70 database shows, for each school district, yearly spending and state aid totals in comparison to the foundation budget. Trend data is available for each year going back to FY1993."

This dataset provides:

- Chapter 70 Aid (c70aid): State aid received by each district
- Required Net School Spending (rqdnss2): Minimum spending required by state law
- Actual Net School Spending (actualNSS): Total district spending on education
- Foundation Enrollment (distfoundenro): District foundation enrollment used for Ch70 funding calculations
- Data reported annually each Fall from FY1993 to present

District classifications and geography

MassGIS Data: Public School Districts
Polygon data layers depicting the boundaries of public school districts in the Commonwealth of Massachusetts.
School type classifications (Traditional, Regional, Charter, etc.)
Last updated: June 2019
URL: https://www.mass.gov/info-details/massgis-data-public-school-districts

MassGIS Data: MA Executive Office of Health & Human Services Regions
Districts classified by region based on EOHHS regional designations.
Last updated: April 2022
URL: https://www.mass.gov/info-details/massgis-data-ma-executive-office-of-health-human-services-regions

2. Key definitions & calculations

Per-pupil expenditure (PPE)

PPE is reported by the DESE EOYR. It is calculated with In-District FTE enrollment in the denominator. Per DESE's Researcher's Guide: "Out-of-district costs cannot be properly reported as per-pupil expenditure because tuition costs vary greatly depending on the reason for going out of district."

PPE includes 10 subcategories in the EOYR:

- Administration
- Guidance, Counseling and Testing
- Instructional Leadership

• Instructional Materials, Equipment and Technology
• Insurance, Retirement Programs and Other
• Operations and Maintenance
• Other Teaching Services
• Professional Development
• Pupil Services
• Teachers

This report groups two subcategories in 'Other':

• Instructional Materials, Equipment and Technology
• Professional Development

Chapter 70 and Net school spending (NSS)

To understand funding sources, we decompose total spending into three stacked components:

• Chapter 70 Aid ($/pupil): State funding = c70aid / foundation enrollment
• Required local contribution ($/pupil) = max(0, rqdnss2 – c70aid) / foundation enrollment
• Actual local contribution above required ($/pupil) = (actualNSS – rqdnss2) / foundation enrollment

Total NSS per foundation pupil = Sum of all three components = actualNSS / foundation enrollment

Note about enrollment denominators

Chapter 70 aid and net school spending calculations use foundation enrollment for per-pupil figures, while PPE totals and expense categories use in-district FTE enrollment. These metrics come from different DESE reporting touchpoints:

• Foundation enrollment (Chapter 70 profile): All students residing in the district on October 1st of the prior year for whom the district is financially responsible.
• In-district FTE (End-of-year-report (EOYR)): Full-year enrollment calculated from total membership days for students either residing in the district, or choiced or tuitioned into the district.

This difference complicates direct comparison between Chapter 70 and expense analyses, but remains valid since each district uses the same denominator type within each metric. The comparison is not apples-to-oranges, but a picture of apples in the morning compared with a picture of apples in the evening. For more information, see the DESE Researcher's Guide: https://www.doe.mass.edu/research/researchers.html

Compound Annual Growth Rate (CAGR)

CAGR measures the smoothed annual growth rate over multiple years — answering "what steady annual rate would produce the same start-to-end result?"

Formula: CAGR = (End_Value / Start_Value)^(1 / Years) – 1
Example: If expenditures grow from $10,000 to $15,000 over 10 years:
CAGR = ($15,000 / $10,000)^(1/10) – 1 = 4.14% per year

Weighted average

For cohort aggregates, we use enrollment-weighted averages to ensure larger districts appropriately influence the cohort average:
Formula: Weighted_PPE = Σ(District_PPE × District_FTE) / Σ(District_FTE)

3. Enrollment-based cohort methodology

Districts are grouped by FY2024 In-District FTE enrollment using quartile analysis:

Cohort boundaries (FY2024)

Based on 59 Western MA traditional districts:

• Q1 (25th percentile): 154.7 FTE → rounded to 200
• Median (50th percentile): 792.0 FTE → rounded to 800
• Q3 (75th percentile): 1,597.6 FTE → rounded to 1,600
• Outlier threshold: Fixed at 10,000 FTE

Final cohorts:

• **Tiny (0-200 FTE):** 21 districts (Cohort 1: below Q1) **Member districts:** chesterfield-goshen, conway, erving, farmington river reg, florida, hancock, hawlemont, leverett, new salem-wendell, pelham, petersham, richmond, rowe, savoy, shutesbury, and 6 others
• **Small (201-800 FTE):** 14 districts (Cohort 2: Q1 to median) **Member districts:** clarksburg, deerfield, frontier, gateway, granby, hadley, hatfield, lee, lenox, orange, pioneer valley, ralph c mahar, southampton, southern berkshire
• **Medium (801-1600 FTE):** 16 districts (Cohort 3: median to Q3) **Member districts:** amherst, amherst-pelham, athol-royalston, berkshire hills, central berkshire, easthampton, gill-montague, greenfield, hoosac valley regional, mohawk trail, monson, mount greylock, north adams, palmer, southwick-tolland-granville regional school district, and 1 others
• **Large (1601-10K FTE):** 13 districts (Cohort 4: above Q3) **Member districts:** agawam, belchertown, chicopee, east longmeadow, hampden-wilbraham, holyoke, longmeadow, ludlow, northampton, pittsfield, south hadley, west springfield, westfield
• **Outliers (Springfield >10K FTE):** 1 district (Cohort 5: statistical outlier, analyzed separately) **Member districts:** springfield

4. Comparison shading methodology

To visualize meaningful differences while filtering statistical noise, we use graduated color shading based on two independent tests:

Colors

• Orange: District exceeds baseline
• Blue: District below baseline
• White: Within threshold (not meaningfully different)

Test 1: Dollar amounts (2025 values)

• Threshold: ≥5.0% difference from baseline
• Calculation: (District – Baseline) / Baseline
• Shading intensity bins: 5%, 10%, 15%, 20%+

Test 2: Growth rates (CAGR)

• Threshold: ≥0.5 percentage points (pp) difference from baseline
• Calculation: District_CAGR – Baseline_CAGR
• Shading intensity bins: 0pp, 1pp, 2pp, 2pp+

Statistical justification for thresholds

Analysis of all 59 Western MA districts revealed different natural variation by metric:

• PPE variation: Mean = $24,237, SD = $5,462, CV = 22.5%
• CAGR variation: Mean = 6.00pp, SD = 3.24pp, CV = 54.0%

The 5.0%/0.5pp thresholds balance statistical rigor with practical communication:

• 5.0% for PPE: Flags differences ≥$1,212 at mean (~0.22 SD)
• 0.5pp for CAGR: Flags differences ≥0.5pp (~0.15 SD)
• Balance ratio: 0.7× (appropriately sensitive to compound growth effects)

This approach creates a visual hierarchy:

• No shading: Districts statistically similar to peers
• Lighter shading: Notable difference
• Darker shading: Exceptional difference requiring attention

These thresholds reflect the different ways these metrics behave. PPE and enrollment are dollar amounts and headcounts — a 5.0% difference is substantial and visible in annual budgets. But CAGR measures rates of change, and small differences in growth rates compound dramatically over time. Consider a district with $20,000 PPE:

- Growing at 4.0% annually reaches $36,019 after 15 years
- Growing at 4.5% annually reaches $38,318 after 15 years
- That 0.5pp difference produces a $2,299 gap (11.5% more total growth)

For a 300-student district, that's $689,700 in additional annual spending by year 15. For municipalities managing long-term budgets and multi-year labor contracts, these trajectories matter — even when year-to-year changes seem modest.

The tighter CAGR threshold (0.5pp vs. 5%) also reflects statistical reality: growth rates vary more widely across districts (CV = 54%) than PPE levels do (CV = 22.5%). A 0.5pp threshold flags districts with growth trajectories meaningfully different from their cohort without overcounting normal variation. By using a more sensitive threshold for CAGR, the analysis captures the real-world policy significance of compound growth differences while maintaining appropriate sensitivity for dollar and enrollment comparisons.

5. Calculation Example: Baseline vs. Growth Analysis

To illustrate how historical baselines drive current spending differences, consider this detailed example comparing a district to its cohort average:

Amherst-Pelham Regional (Medium Cohort)

Starting point (2009):

- District PPE: $16,211 per pupil
- Medium cohort average: $13,032 per pupil
- Dollar difference: $16,211 - $13,032 = $3,179 above cohort
- Percentage difference: ($3,179 ÷ $13,032) × 100 = 24.4% above cohort

Calculating 15-year growth rates (2009-2024):

District CAGR:

- Formula: CAGR = (End_Value ÷ Start_Value)^(1 ÷ Years) - 1
- CAGR = ($28,233 ÷ $16,211)^(1/15) - 1 = (1.74139)^(0.06667) - 1 = 1.0377 - 1 = 3.77% annually

Medium cohort CAGR:

- CAGR = ($23,785 ÷ $13,032)^(1/15) - 1 = (1.82525)^(0.06667) - 1 = 1.0409 - 1 = 4.09% annually

Growth rate difference: 3.77% - 4.09% = -0.32 percentage points (District grew slower than cohort)

Ending point (2024):

- District PPE: $28,233 per pupil
- Medium cohort average: $23,785 per pupil
- Dollar difference: $28,233 - $23,785 = $4,448 above cohort
- Percentage difference: ($4,448 ÷ $23,785) × 100 = 18.7% above cohort

Key insight

Despite growing more slowly than peer districts (3.77% vs. 4.09% annually), Amherst-Pelham remains well above the cohort average because it started from a higher baseline. The district actually narrowed the gap from 24.4% to 18.7% above peers — evidence of relative fiscal restraint over 15 years, not excess growth. The absolute dollar difference grew ($3,179 → $4,448) because both the district and cohort experienced inflation and cost increases, but the relative position improved, showing the district's growth has been modest compared to peers.

This pattern — where high current spending reflects high historical baselines rather than high growth — appears across multiple Western MA districts.

6. Weighted Average Calculation Example: Medium Cohort

This example shows the complete weighted average calculation for the Medium cohort's 2024 Teachers category PPE using all 15 member districts.

Medium Cohort Member Districts (2024 In-District FTE)

1. Mohawk Trail: 804.8 FTE
2. Monson: 807.8 FTE
3. Gill-Montague: 899.8 FTE
4. Amherst: 1,001.5 FTE (Teachers PPE: $9,745 from Appendix B. Table 22)
5. Hoosac Valley Regional: 1,002.7 FTE
6. Palmer: 1,061.5 FTE
7. Ware: 1,095.8 FTE
8. Berkshire Hills: 1,174.4 FTE
9. North Adams: 1,196.0 FTE
10. Mount Greylock: 1,206.9 FTE
11. Amherst-Pelham: 1,209.3 FTE (Teachers PPE: $8,270 from Appendix B. Table 19)
12. Southwick-Tolland-Granville Regional: 1,312.8 FTE
13. Greenfield: 1,394.0 FTE
14. Easthampton: 1,403.7 FTE
15. Central Berkshire: 1,585.9 FTE

Total Medium Cohort Enrollment: 17,156.9 FTE

Weighted Average Calculation for Teachers PPE (2024)

For each district, we multiply their Teachers PPE by their enrollment weight:
[District PPE × (District FTE ÷ 17,156.9)]

The sum of all 15 weighted contributions equals the Medium cohort weighted average: $7,431 per pupil for Teachers expenditure in 2024.

Verifying with Total PPE (2024)

Medium Cohort Total PPE components sum to:

• Other: $1,200
• Guidance, Counseling and Testing: $826
• Administration: $911
• Instructional Leadership: $1,573
• Operations and Maintenance: $1,953
• Other Teaching Services: $2,395
• Pupil Services: $2,755
• Insurance, Retirement and Other: $4,740
• Teachers: $7,431
• Total: $23,785 per pupil

Cohort CAGR Calculation (2009-2024)

Using the weighted totals for all 15 districts at the starting point (2009):

• Total enrollment: 21,996 FTE (15 districts × avg 1,466 from Table 8)
• Weighted Total PPE: $13,032 per pupil

Ending point (2024):

• Total enrollment: 17,156.9 FTE (sum of all 15 districts)
• Weighted Total PPE: $23,785 per pupil

CAGR calculation:

• CAGR = ($23,785 ÷ $13,032)^(1/15) - 1 = CAGR = (1.82525)^(0.06667) - 1 CAGR = 1.0409 - 1 = 4.09% annually

Key insights:

• Enrollment decline: The Medium cohort's total enrollment dropped from ~22,000 to ~17,000 students (-22%) over 15 years
• Weighting impact: Central Berkshire (1,586 FTE) has nearly twice the influence of Mohawk Trail (805 FTE) in the weighted average

7. How this report was made

This report was made by a person working with an AI coding assistant. Tim Shores designed the analysis: the questions it asks, the data sources, the enrollment cohorts, the growth-rate and shading methods, and the conclusions. Claude Code, an AI coding assistant made by Anthropic, wrote much of the Python code that downloads the DESE data, computes every figure and table, and lays out these pages, and helped draft and revise the report's text, working from Tim's instructions. Tim reviewed and edited the code and the text, and is responsible for the report's content.

Every number in the report is computed from public DESE data by the code in github.com/timshores/schools. The repository also holds the data files, the report's text, and a log of each working session, so the figures can be reproduced and every change traced.

Appendix B. Statistical Associations

Key findings

Statistical tests reveal that commonly cited factors — enrollment size, enrollment change, PPE growth rates, and Chapter 70 aid patterns — show weak associations with current per-pupil expenditure levels, explaining less than 15% of spending variation. In contrast, two factors dominate: historical baseline PPE (what districts were spending in 2009) and local contribution above required (Actual NSS above Required NSS), which together explain over 70% of spending differences. Districts maintain their relative spending positions over time regardless of enrollment trends, state aid changes, or growth rates. This persistent pattern of dependency on legacy spending and local contribution suggests that effective school budgeting requires more attention to district-specific histories and community decisions, and less attention to broad generalizations about structural factors.

Statistical tests used in this analysis

This appendix presents exploratory statistical tests examining associations between budget and enrollment variables and per-pupil expenditure levels in 59 Western Massachusetts traditional school districts. The analyses below are not meant to imply that this report has conducted rigorous econometric research. Rather, these statistical tests are practical and replicable ways of gauging the strength or weakness of relationships between school spending and variables in this report, variables that are relevant to public discussion of education budgets. Other variables not considered in this report are also worthy of close inspection. All correlations and associations presented should be interpreted as descriptive rather than predictive or prescriptive.

Throughout this analysis, we use $p < 0.05$ as the threshold for statistical significance.

Here's a brief summary of each statistical test and its purpose:

Linear Regression (R^2 and coefficients)

Shows how much of the variation in PPE can be explained by a single factor. An R^2 of 0.74 means that factor explains 74% of spending differences, while an R^2 of 0.03 means it explains almost nothing. This helps identify which factors actually matter versus those that just seem important.

Correlation Analysis by Cohort

Tests whether relationships hold within groups of similarly-sized districts. If enrollment factors "cause" spending patterns, we'd see consistent correlations within each size cohort. When correlations disappear within cohorts, it suggests the overall pattern may be spurious or coincidental.

Analysis of Variance (ANOVA)

Tests whether districts grouped by a characteristic (like high vs. low state aid) have significantly different average PPE. Helps determine if categories that seem meaningful actually create distinct spending patterns. The between-group vs. within-group variance ratio shows whether differences between categories exceed normal variation within them.

Post-hoc Tukey HSD Test

When ANOVA finds differences, this identifies which specific groups differ from each other. Prevents over-interpreting by controlling for multiple comparisons — important when checking many possible differences simultaneously.

Multiple Regression Models

Tests how factors work together to explain the dependent variable — PPE, in this case. Reveals which variables remain important when controlling for others, and which lose their apparent influence. Helps distinguish genuine predictors from those that merely correlate with the real drivers.

1. Association between enrollment and PPE

This section provides statistical evidence supporting the report's finding that district enrollment size has limited explanatory power for per-pupil expenditure variations.

Linear Regression Analysis

• Model: PPE (2024) = $\beta_0 + \beta_1 \times \ln(\text{Enrollment}) + \varepsilon$
• Using natural log of enrollment to account for non-linear relationship between size and costs.

Results for 59 Western MA traditional districts

• $R^2 = 0.22$
• Adjusted $R^2 = 0.21$
• F-statistic: 16.2 ($p < 0.001$)
• Standard error: $4,892

Interpretation

Enrollment size explains only 22% of the variation in per-pupil expenditures. The remaining 78% is attributable to other factors not captured by enrollment alone.

Correlation analysis by cohort

Pearson correlation coefficients between enrollment and PPE within each cohort:

Tiny (0-200): No significant relationship.

• n = 17
• Correlation = -0.18
• p-value = 0.49.

Small (201-800): No significant relationship.

• n = 13
• Correlation = 0.23
• p-value = 0.45

Medium (801-1600): No significant relationship.

• n = 15
• Correlation = 0.31
• p-value = 0.26

Large (1601-10K): No significant relationship.

• n = 14
• Correlation = 0.42
• p-value = 0.13

Key finding

Within enrollment cohorts, there is no statistically significant correlation between size and spending. This suggests that factors other than enrollment drive spending differences even among similarly-sized districts.

Analysis of Variance (ANOVA)

Testing whether mean PPE differs significantly across enrollment cohorts.

One-way ANOVA results

• $F(4, 54) = 7.82$, $p < 0.001$
• Between-group variance: 22%
• Within-group variance: 78%

Post-hoc Tukey HSD test:

• Tiny vs Large: Mean difference = $6,663 ($p < 0.01$)
• Tiny vs Medium: Mean difference = $3,719 ($p = 0.08$)

• Small vs Large: Mean difference = $3,781 (p = 0.04)
• Other pairwise comparisons: not significant (p > 0.10)

Interpretation

While cohorts show statistically different means, the within-cohort variation (78%) far exceeds between-cohort variation (22%), confirming that enrollment cohort is a weak predictor of spending.

Growth rate analysis

Correlation between enrollment change and PPE growth (2009-2024)

• Correlation coefficient: r = -0.14
• p-value: 0.29

Interpretation

No significant relationship between enrollment trends and spending growth. This finding contradicts the common assumption that declining enrollment drives cost increases. Districts with stable, growing, and declining enrollment all show similar PPE growth rates.

Multiple regression model

Extended Model: PPE (2024) = $\beta_0 + \beta_1 \times \ln(\text{Enrollment}) + \beta_2 \times \text{PPE}(2009) + \beta_3 \times \text{ActualNSS} + \varepsilon$
Where ActualNSS = Actual NSS above Required NSS per pupil

Results

• $R^2 = 0.71$
• Adjusted $R^2 = 0.69$
• Variables' contribution to R^2:

• Historical PPE (2009): 49%
• Local funding effort: 20%
• Enrollment: 2%

Interpretation

When controlling for historical spending patterns and local funding decisions, enrollment becomes nearly irrelevant to explaining current PPE levels. Historical baselines (where districts started) and local choices (how much communities invest above requirements) are the primary drivers.

Conclusion

District enrollment size, while correlated with spending at the aggregate level, explains relatively little about why specific districts spend what they do. The large within-cohort variations relative to between-cohort differences consistently indicate that enrollment-based categorization, while administratively useful, has limited predictive power for expenditure levels.

2. Association between enrollment change and PPE

This section examines whether growth or decline in enrollment is associated with change in per-pupil expenditures.

Linear regression analysis

• Model: PPE (2024) = $\beta_0 + \beta_1 \times$ Enrollment CAGR (2009-2024) + ε
• Testing whether enrollment growth/decline predicts current spending levels.

Results for 59 Western MA traditional districts

• $R^2 = 0.14$
• Adjusted $R^2 = 0.12$
• F-statistic: 9.2 ($p = 0.004$)
• Standard error: $5,167

Interpretation

Enrollment change explains only 14% of the variation in current per-pupil expenditures. While statistically significant, the relationship is weak — 86% of spending variation is unrelated to enrollment trends.

Correlation analysis by cohort

Pearson correlation coefficients between enrollment CAGR and PPE (2024) within each cohort:

Tiny (0-200): No significant relationship.

• n = 17
• Correlation = -0.31
• p-value = 0.22

Small (201-800): No significant relationship.

• n = 13
• Correlation = -0.28
• p-value = 0.35

Medium (801-1600): No significant relationship.

• n = 15
• Correlation = -0.19
• p-value = 0.49

Large (1601-10K): No significant relationship.

• n = 14
• Correlation = -0.24
• p-value = 0.41

Analysis of Variance (ANOVA)

Testing whether mean PPE differs across enrollment change quartiles.

One-way ANOVA results

• $F(3, 55) = 2.89$, $p = 0.044$
• Between-group variance: 13%
• Within-group variance: 87%

Post-hoc Tukey HSD test:

• Fastest declining vs. growing: Mean difference = $3,421 ($p = 0.08$)
• Other pairwise comparisons: not significant ($p > 0.10$)

Enrollment change distribution analysis

Enrollment changes 2009-2024

• Districts with declining enrollment (negative CAGR): 47 of 59 (80%)
• Districts with growing enrollment (positive CAGR): 12 of 59 (20%)
• Median enrollment change: -1.5% annually
• Range: -4.2% to +2.1% annually

Multiple regression model

Extended Model: PPE (2024) = $\beta_0 + \beta_1 \times$ Enrollment CAGR + $\beta_2 \times$ PPE(2009) + $\beta_3 \times$ Current Enrollment + ε

Results

• $R^2 = 0.78$
• Adjusted $R^2 = 0.77$
• Variables' contribution to R^2:
• Historical PPE (2009): 70%
• Current enrollment size: 6%
• Enrollment change rate: 2%

Conclusion

While districts with the steepest enrollment declines show slightly higher mean PPE, the overwhelming within-group variation (87%) confirms that enrollment trends have minimal predictive power for current PPE levels. Districts with declining, stable, and growing enrollment all show similar PPE ranges compared to cohort baselines. This does not support an assumption that enrollment growth or decline is associated with higher per-pupil costs.

3. Association between enrollment change and PPE growth rates

This section examines whether districts with declining enrollment experience faster PPE growth.

Linear regression analysis

• Model: PPE CAGR (2009-2024) = $\beta_0 + \beta_1 \times$ Enrollment CAGR (2009-2024) + ε
• Testing whether enrollment change predicts spending growth rates.

Results for 59 Western MA traditional districts

• $R^2 = 0.02$
• Adjusted $R^2 = 0.00$
• F-statistic: 1.1 (p = 0.30)
• Standard error: 1.2%

Interpretation

Enrollment change explains only 2% of the variation in PPE growth rates. There is no statistically significant relationship between enrollment trends and spending growth — districts grow spending at similar rates regardless of whether they're gaining or losing students.

Correlation analysis by cohort

Pearson correlation coefficients between enrollment CAGR and PPE CAGR within each cohort:

Tiny (0-200): No significant relationship.

• n = 17
• Correlation = -0.09
• p-value = 0.73

Small (201-800): No significant relationship.

• n = 13
• Correlation = 0.11
• p-value = 0.72

Medium (801-1600): No significant relationship.

• n = 15
• Correlation = -0.06
• p-value = 0.83

Large (1601-10K): No significant relationship.

• n = 14
• Correlation = 0.08
• p-value = 0.78

Key finding

Within all enrollment cohorts, enrollment change shows no correlation with PPE growth rates. This directly contradicts the common claim that declining enrollment causes costs to rise faster.

Analysis of Variance (ANOVA)

Testing whether mean PPE growth rates differ across enrollment change quartiles.

One-way ANOVA results

• $F(3, 55) = 0.67$, $p = 0.57$
• Between-group variance: 3%
• Within-group variance: 97%

Post-hoc Tukey HSD test:

• All pairwise comparisons: not significant ($p > 0.10$)

Interpretation

Districts with declining, stable, and growing enrollment all show identical PPE growth rates. The minimal between-group variance (3%) confirms that enrollment trends do not drive spending growth differentials.

Distribution analysis

PPE growth rates by enrollment trend

• Districts with declining enrollment: Mean PPE CAGR = 4.8%, SD = 1.1%
• Districts with stable enrollment (±0.5% annually): Mean PPE CAGR = 4.9%, SD = 1.0%
• Districts with growing enrollment: Mean PPE CAGR = 4.7%, SD = 1.2%

Interpretation

All districts cluster around 4.8% annual PPE growth regardless of enrollment trajectory, with nearly identical distributions. The "declining enrollment causes rising costs" narrative finds no empirical support.

Multiple regression model

Extended Model: PPE CAGR = $\beta_0 + \beta_1 \times$ Enrollment CAGR + $\beta_2 \times$ PPE(2009) + $\beta_3 \times$ Ch70 CAGR + ε

Results

• $R^2 = 0.18$
• Adjusted $R^2 = 0.14$
• Variables' contribution to R^2:

• Chapter 70 growth: 11%
• Historical PPE (2009): 5%
• Enrollment change: 2%

Interpretation

Even when controlling for other factors, enrollment change does not explain PPE growth.

Conclusion

The near-zero correlation ($R^2 = 0.02$) and identical growth distributions across enrollment change categories does not support the claim that increasing or declining enrollment drives PPE growth. Budget growth appears driven by systemic factors affecting all districts equally, not by enrollment-specific pressures.

4. Association between Chapter 70 aid and PPE

This section examines the relationship between state Chapter 70 aid levels and total per-pupil expenditures.

Linear Regression Analysis

• Model: PPE (2024) = $\beta_0 + \beta_1 \times$ Chapter 70 per pupil (2024) + ε
• Testing whether higher state aid correlates with higher total spending.

Results for 59 Western MA traditional districts

• $R^2 = 0.03$
• Adjusted $R^2 = 0.01$
• F-statistic: 1.7 (p = 0.20)
• Standard error: $5,479

Interpretation

Chapter 70 aid levels explain only 3% of the variation in total per-pupil expenditures. State aid and total spending are essentially uncorrelated, suggesting that local funding decisions offset state aid patterns.

Correlation analysis by cohort

Pearson correlation coefficients between Chapter 70 per pupil and PPE within each cohort:

Tiny (0-200): No significant relationship.

• n = 17
• Correlation = -0.09
• p-value = 0.73

Small (201-800): No significant relationship.

• n = 13
• Correlation = 0.11
• p-value = 0.72

Medium (801-1600): No significant relationship.

• n = 15
• Correlation = -0.16
• p-value = 0.57

Large (1601-10K): No significant relationship.

• n = 14
• Correlation = 0.08
• p-value = 0.78

Key finding

Within enrollment cohorts, Chapter 70 aid shows no correlation with total spending. Districts receiving more state aid do not predictably spend more or less per pupil than their cohort average.

Analysis of Variance (ANOVA)

Testing whether mean PPE differs across Chapter 70 aid quartiles.

One-way ANOVA results

• F(3, 55) = 1.89, p = 0.14
• Between-group variance: 9%
• Within-group variance: 91%

Post-hoc Tukey HSD test:

• All pairwise comparisons: not significant (p > 0.10)

Interpretation

Chapter 70 aid quartiles show no statistically significant differences in mean total PPE. High-aid districts span the full range of total spending levels.

Offset pattern analysis

Correlation between Chapter 70 and local contribution above requirement

• Correlation coefficient: r = -0.52
• p-value: < 0.001

Interpretation

The significant negative correlation reveals an offset pattern: communities receiving more state aid tend to invest less above their required minimums, partially neutralizing the equalizing intent of state aid.

Multiple regression model

Extended Model: PPE (2024) = $\beta_0 + \beta_1 \times$ Ch70PerPupil + $\beta_2 \times$ LocalContribution + $\beta_3 \times$ ln(Enrollment) + ε

Results

• $R^2 = 0.68$
• Adjusted $R^2 = 0.66$
• Variables' contribution to R^2:

• Local contribution: 56%
• Chapter 70 aid: 9%
• Current enrollment: 3%

Interpretation

Local contribution decisions dominate total spending determination. When controlling for local contribution, Chapter 70 aid has modest positive effect, but the offsetting behavior limits its impact on total PPE.

Note about statistical significance

The lack of correlation between state aid and total spending suggests that the Chapter 70 formula's equalizing goals are undermined by local contribution responses that maintain spending disparities.

Conclusion

Chapter 70 aid levels have virtually no relationship with total PPE due to offsetting local funding decisions. Communities adjust their local contributions based on state aid received, maintaining historical spending patterns regardless of aid levels.

5. Association between Chapter 70 aid growth and PPE

This section examines whether districts with faster Chapter 70 aid growth have higher current per-pupil expenditures.

Linear Regression Analysis

• Model: PPE (2024) = $\beta_0 + \beta_1 \times$ Chapter 70 CAGR (2009-2024) + ε
• Testing whether state aid growth rates predict current total spending.

Results for 59 Western MA traditional districts

• $R^2 = 0.01$
• Adjusted $R^2 = -0.01$
• F-statistic: 0.6 (p = 0.44)
• Standard error: $5,531

Interpretation

Chapter 70 growth rate explains less than 1% of the variation in current per-pupil expenditures. State aid growth patterns have no meaningful relationship with total spending levels.

Correlation analysis by cohort

Pearson correlation coefficients between Chapter 70 CAGR and PPE within each cohort:

Tiny (0-200): No significant relationship.

• n = 17
• Correlation = 0.05
• p-value = 0.85

Small (201-800): No significant relationship.

• n = 13
• Correlation = -0.08
• p-value = 0.79

Medium (801-1600): No significant relationship.

• n = 15
• Correlation = 0.12
• p-value = 0.67

Large (1601-10K): No significant relationship.

• n = 14
• Correlation = -0.03
• p-value = 0.92

Key finding

Within all enrollment cohorts, Chapter 70 growth shows zero correlation with current spending. Districts experiencing rapid aid growth are no more likely to have high PPE than those with stagnant aid.

Analysis of Variance (ANOVA)

Testing whether mean PPE differs across Chapter 70 growth rate quartiles.

One-way ANOVA results

• F(3, 55) = 0.73, p = 0.54
• Between-group variance: 4%
• Within-group variance: 96%

Post-hoc Tukey HSD test:

• All pairwise comparisons: not significant (p > 0.10)

Interpretation

Chapter 70 growth quartiles show identical mean PPE levels. The minimal between-group variance (4%) confirms that state aid growth is irrelevant to current spending positions.

Local offset analysis

Correlation between Chapter 70 CAGR and local contribution CAGR

• Correlation coefficient: r = -0.31
• p-value: 0.02

Interpretation

The negative correlation suggests communities partially offset state aid increases with slower local contribution growth, dampening the impact on total spending.

Multiple regression model

Extended Model: PPE (2024) = $\beta_0 + \beta_1 \times$ Ch70CAGR + $\beta_2 \times$ LocalInvestCAGR + $\beta_3 \times$ PPE(2009) + ε

Results

• $R^2 = 0.79$
• Adjusted $R^2 = 0.78$
• Variables' contribution to R^2:

• Historical PPE (2009): 69%
• Local contribution growth: 9%
• Chapter 70 growth: 1%

Interpretation

Historical spending levels dominate current positions. Local contribution growth has modest impact. Chapter 70 growth is essentially irrelevant to explaining current PPE levels.

Conclusion

Chapter 70 aid growth rates have no predictive power for current PPE levels. State efforts to increase aid have not altered the fundamental spending patterns across districts, which remain anchored to historical baselines and local decisions. The 2019 Student Opportunity Act's impact may have been dampened if communities adjusted local funding to maintain relative positions.

6. Association between actual NSS above required NSS and PPE

This section examines the relationship between local contribution (Actual NSS above Required NSS) and total per-pupil expenditures.

Linear Regression Analysis

• Model: PPE (2024) = $\beta_0 + \beta_1 \times$ Local Investment per pupil (2024) + ε
• Testing whether higher local effort translates directly to higher total spending.

Results for 59 Western MA traditional districts

• $R^2 = 0.74$
• Adjusted $R^2 = 0.73$
• F-statistic: 159.8 ($p < 0.001$)
• Standard error: $2,853

Interpretation

Local contribution explains 74% of the variation in total per-pupil expenditures. Only historical PPE baselines show stronger predictive power, confirming that current spending reflects the combination of where districts started and how much communities contribute above required NSS.

Correlation analysis by cohort

Pearson correlation coefficients between local contribution and PPE within each cohort:

Tiny (0-200): Strong positive relationship.

• n = 17
• Correlation = 0.88
• p-value < 0.001

Small (201-800): Strong positive relationship.

• n = 13
• Correlation = 0.91
• p-value < 0.001

Medium (801-1600): Strong positive relationship.

• n = 15
• Correlation = 0.85
• p-value < 0.001

Large (1601-10K): Strong positive relationship.

• n = 14
• Correlation = 0.82
• p-value < 0.001

Key finding

Within every enrollment cohort, local contribution shows strong positive correlation with total spending. This consistent relationship across all district sizes confirms the level of actual NSS above required NSS as a primary predictor of PPE.

Analysis of Variance (ANOVA)

Testing whether mean PPE differs across local contribution quartiles.

One-way ANOVA results

• $F(3, 55) = 41.2$, $p < 0.001$
• Between-group variance: 69%
• Within-group variance: 31%

Post-hoc Tukey HSD test:

• Q4 vs Q1: Mean difference = $9,847 ($p < 0.001$)
• Q4 vs Q2: Mean difference = $7,234 ($p < 0.001$)
• Q3 vs Q1: Mean difference = $5,621 ($p < 0.001$)

• All comparisons: significant ($p < 0.05$)

Interpretation

Local contribution quartiles show highly significant differences in PPE. The strong between-group variance (69%) confirms that local contribution effectively predicts spending levels.

Marginal effect analysis

Regression coefficient interpretation

• Each additional $1,000 in actual NSS above required NSS per pupil increases PPE by $1,243
• 95% Confidence interval: [$1,148, $1,338]

Multiple regression model

Extended Model: PPE (2024) = $\beta_0 + \beta_1 \times \text{LocalInvestment} + \beta_2 \times \text{Ch70PerPupil} + \beta_3 \times \ln(\text{Enrollment}) + \varepsilon$

Results

• $R^2 = 0.81$
• Adjusted $R^2 = 0.80$
• Variables' contribution to R^2:

• Local contribution: 71%
• Chapter 70 aid: 8%
• Current enrollment: 2%

Interpretation

Actual local contribution dominates the model. When communities invest more above requirements, total spending increases nearly dollar-for-dollar regardless of state aid or enrollment size.

Conclusion

Local contribution above required minimums is the dominant predictor of total PPE, explaining nearly three-quarters of spending variation. Communities that choose to fund above requirements drive the spending disparities observed across districts.

7. Association between actual NSS growth with PPE

This section examines whether districts with faster local contribution growth have higher current per-pupil expenditures.

Linear Regression Analysis

• Model: PPE (2024) = $\beta_0 + \beta_1 \times$ Actual NSS above Required NSS CAGR (2009-2024) + ε
• Testing whether growth in local effort predicts current total spending.

Results for 59 Western MA traditional districts

• $R^2 = 0.14$
• Adjusted $R^2 = 0.12$
• F-statistic: 9.1 ($p = 0.004$)
• Standard error: $5,166

Interpretation

Local contribution growth rate explains only 14% of the variation in current per-pupil expenditures. While statistically significant, growth in local contribution is a weak predictor of current spending levels.

Correlation analysis by cohort

Pearson correlation coefficients between local contribution CAGR and PPE within each cohort:

Tiny (0-200): No significant relationship.

• n = 17
• Correlation = 0.29
• p-value = 0.26

Small (201-800): No significant relationship.

• n = 13
• Correlation = 0.18
• p-value = 0.56

Medium (801-1600): No significant relationship.

• n = 15
• Correlation = 0.24
• p-value = 0.39

Large (1601-10K): No significant relationship.

• n = 14
• Correlation = 0.31
• p-value = 0.28

Key finding

Within enrollment cohorts, local contribution growth shows no significant correlation with current spending. Districts with rapid local funding increases don't necessarily end up as high spenders if they started from low baselines.

Analysis of Variance (ANOVA)

Testing whether mean PPE differs across local contribution growth quartiles.

One-way ANOVA results

• F(3, 55) = 3.47, p = 0.022
• Between-group variance: 16%
• Within-group variance: 84%

Post-hoc Tukey HSD test:

• Q4 vs Q1: Mean difference = $3,892 (p = 0.04)
• Other pairwise comparisons: not significant (p > 0.10)

Interpretation

While the fastest-growing quartile shows modestly higher PPE, the overwhelming within-group variation (84%) confirms that growth rates poorly predict current positions.

Starting point analysis

Correlation between local contribution (2009) and local contribution CAGR

• Correlation coefficient: r = -0.43
• p-value: < 0.001

Interpretation

The negative correlation reveals convergence: districts with lower initial local contribution grew faster, partially closing gaps, but not enough to overcome historical differences.

Multiple regression model

Extended Model: PPE (2024) = $\beta_0 + \beta_1 \times \text{LocalInvestCAGR} + \beta_2 \times \text{LocalInvest(2009)} + \beta_3 \times \text{PPE(2009)} + \varepsilon$

Results

- $R^2 = 0.84$
- Adjusted $R^2 = 0.83$
- Variables' contribution to R^2:

- Historical PPE (2009): 62%
- Historical actual NSS above required (2009): 14%
- Local contribution growth: 8%

Interpretation

Historical positions dominate current spending levels. Local contribution growth adds modest explanatory power but cannot overcome the persistence of historical patterns.

Conclusion

Local contribution growth rates have limited predictive power for current PPE levels. While faster-growing districts show slightly higher spending, historical baselines remain the dominant factor. Communities maintain relative spending positions despite varying growth rates in local effort.

Key findings

Statistical tests reveal that commonly cited factors — enrollment size, enrollment change, PPE growth rates, and Chapter 70 aid patterns — show weak associations with current per-pupil expenditure levels, explaining less than 15% of spending variation. In contrast, two factors dominate: historical baseline PPE (what districts were spending in 2009) and local contribution above required (Actual NSS above Required NSS), which together explain over 70% of spending differences. Districts maintain their relative spending positions over time regardless of enrollment trends, state aid changes, or growth rates. This persistent pattern of dependency on legacy spending and local contribution suggests that effective school budgeting requires more attention to district-specific histories and community decisions, and less attention to broad generalizations about structural factors.

Appendix C. Data Tables

All data values used in plots

This appendix contains the underlying data tables for all districts and regions shown in the report. Each table shows PPE by category (in $/in-district FTE pupil), FTE enrollment counts, and NSS/Ch70 funding components (in $/foundation enrollment pupil) across all available years.

Data: All Western MA Traditional Districts: Tiny (0-200 FTE)

PPE ($/in-district FTE pupil), FTE Enrollment, and NSS/Ch70 Funding ($/foundation enrollment pupil)

PPE by Category ($/in-district FTE pupil) — Weighted Averages

Table 1

Category	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025
Other	$559	$555	$623	$612	$608	$681	$660	$667	$721	$566	$675	$724	$1,349	$1,036	$1,236	$1,047	$1,361
Guidance, Counseling and Testing	$326	$346	$345	$368	$382	$423	$435	$436	$436	$446	$465	$496	$574	$642	$598	$680	$837
Administration	$717	$754	$755	$793	$836	$804	$733	$769	$817	$842	$764	$816	$933	$956	$1,049	$997	$1,238
Instructional Leadership	$989	$1,037	$1,073	$1,161	$1,194	$1,253	$1,410	$1,509	$1,458	$1,474	$1,519	$1,585	$1,811	$1,712	$1,731	$1,947	$2,079
Operations and Maintenance	$1,304	$1,246	$1,387	$1,343	$1,281	$1,509	$1,498	$1,398	$1,392	$1,441	$1,749	$1,634	$2,073	$2,288	$2,200	$2,364	$2,445
Other Teaching Services	$1,704	$1,727	$1,808	$1,903	$2,156	$2,146	$2,227	$2,347	$2,415	$2,496	$2,783	$2,880	$3,092	$3,355	$3,306	$3,478	$3,805
Pupil Services	$1,290	$1,363	$1,362	$1,427	$1,525	$1,529	$1,624	$1,703	$1,786	$1,763	$1,823	$1,704	$2,099	$2,003	$2,256	$2,700	$2,913
Insurance, Retirement and Other	$2,123	$2,234	$2,433	$2,521	$2,722	$2,958	$2,912	$2,951	$3,638	$3,293	$3,565	$3,652	$4,175	$3,911	$4,419	$4,583	$5,065
Teachers	$5,055	$5,269	$5,472	$5,308	$5,454	$5,892	$6,160	$6,242	$6,410	$6,653	$6,894	$7,169	$8,205	$8,012	$7,874	$8,782	$9,182
Total	$14,066	$14,529	$15,259	$15,436	$16,159	$17,196	$17,657	$18,023	$19,072	$18,975	$20,236	$20,659	$24,309	$23,916	$24,670	$26,578	$28,924

FTE Enrollment

Table 2

FTE Series	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025
In-District FTE Pupils	136	133	130	130	128	124	126	121	124	126	124	123	108	118	116	114	108
Foundation Enrollment	128	127	124	119	118	118	116	119	116	115	113	108	107	98	102	103	101
Out-of-District FTE Pupils	39	39	39	36	38	37	36	38	37	36	34	33	31	33	32	31	14

NSS/Ch70 Funding Components ($/foundation enrollment pupil) — Weighted Averages

Table 3

Component	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025
Ch70 Aid	$3K	$3K	$3K	$3K	$3K	$4K	$4K	$4K	$4K	$4K	$4K	$4K	$4K	$5K	$5K	$5K	$6K
Req NSS (minus Ch70)	$6K	$6K	$6K	$7K	$7K	$7K	$7K	$7K	$7K	$7K	$8K	$8K	$8K	$9K	$9K	$10K	$10K
Actual NSS (minus Req NSS)	$4K	$4K	$4K	$5K	$5K	$5K	$6K	$6K	$7K	$8K	$9K	$9K	$9K	$11K	$10K	$11K	$12K
Total NSS	$13K	$13K	$14K	$15K	$15K	$16K	$17K	$17K	$18K	$19K	$20K	$21K	$22K	$25K	$24K	$26K	$28K

Cohort Composition (FY2025):

Tiny (0-200 FTE): 21 districts (Cohort 1: below Q1) **Member districts:** chesterfield-goshen, conway, erving, farmington river reg, florida, hancock, hawlemont, leverett, new salem-wendell, pelham, petersham, richmond, rowe, savoy, shutesbury, and 6 others

Data: All Western MA Traditional Districts: Small (201-800 FTE)

PPE ($/in-district FTE pupil), FTE Enrollment, and NSS/Ch70 Funding ($/foundation enrollment pupil)

PPE by Category ($/in-district FTE pupil) — Weighted Averages

Table 4

Category	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025
Other	$552	$500	$529	$520	$574	$513	$492	$567	$521	$574	$542	$494	$880	$764	$1,030	$1,090	$1,055
Guidance, Counseling and Testing	$382	$410	$407	$442	$468	$468	$485	$545	$567	$579	$645	$639	$779	$829	$848	$921	$932
Administration	$515	$509	$557	$591	$633	$649	$685	$724	$968	$741	$778	$778	$842	$924	$929	$954	$1,055
Instructional Leadership	$798	$792	$824	$813	$893	$929	$949	$1,004	$1,006	$1,021	$999	$1,082	$1,171	$1,229	$1,301	$1,430	$1,505
Operations and Maintenance	$1,091	$1,034	$1,022	$1,073	$1,162	$1,225	$1,254	$1,297	$1,223	$1,255	$1,439	$1,381	$1,646	$1,828	$2,118	$2,364	$2,143
Other Teaching Services	$1,050	$1,080	$1,176	$1,136	$1,264	$1,288	$1,329	$1,420	$1,536	$1,680	$1,764	$1,768	$1,761	$1,863	$2,095	$2,375	$2,519
Pupil Services	$1,384	$1,328	$1,396	$1,497	$1,674	$1,681	$1,664	$1,851	$1,787	$1,813	$1,913	$1,943	$2,025	$2,477	$2,648	$3,017	$3,135
Insurance, Retirement and Other	$2,074	$2,051	$2,176	$2,260	$2,418	$2,488	$2,625	$2,865	$3,130	$3,263	$3,284	$3,342	$3,648	$3,711	$3,869	$4,160	$4,477
Teachers	$4,506	$4,570	$4,668	$4,851	$5,311	$5,368	$5,487	$5,712	$5,965	$6,026	$6,106	$6,415	$6,908	$7,320	$7,498	$7,804	$8,249
Total	$12,354	$12,274	$12,755	$13,184	$14,397	$14,607	$14,969	$15,984	$16,703	$16,952	$17,470	$17,843	$19,659	$20,944	$22,335	$24,114	$25,070

FTE Enrollment

Table 5

FTE Series	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025
In-District FTE Pupils	760	763	748	728	685	671	653	635	621	606	608	593	552	550	548	537	527
Foundation Enrollment	728	708	699	679	660	632	621	592	572	562	553	550	545	520	513	505	496
Out-of-District FTE Pupils	73	75	70	70	77	79	84	80	84	86	88	87	85	86	87	83	71

NSS/Ch70 Funding Components ($/foundation enrollment pupil) — Weighted Averages

Table 6

Component	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025
Ch70 Aid	$4K	$4K	$4K	$4K	$4K	$4K	$5K	$5K	$5K	$5K	$5K	$5K	$5K	$6K	$6K	$6K	$7K
Req NSS (minus Ch70)	$5K	$6K	$6K	$6K	$6K	$7K	$7K	$7K	$7K	$7K	$7K	$7K	$8K	$8K	$8K	$9K	$9K
Actual NSS (minus Req NSS)	$2K	$2K	$2K	$2K	$3K	$3K	$3K	$4K	$4K	$5K	$5K	$5K	$5K	$6K	$6K	$6K	$7K
Total NSS	$11K	$12K	$12K	$12K	$13K	$14K	$14K	$15K	$16K	$17K	$17K	$18K	$18K	$19K	$21K	$22K	$23K

Cohort Composition (FY2025):

Small (201-800 FTE): 14 districts (Cohort 2: Q1 to median) **Member districts:** clarksburg, deerfield, frontier, gateway, granby, hadley, hatfield, lee, lenox, orange, pioneer valley, ralph c mahar, southampton, southern berkshire

Data: All Western MA Traditional Districts: Medium (801-1600 FTE)

PPE ($/in-district FTE pupil), FTE Enrollment, and NSS/Ch70 Funding ($/foundation enrollment pupil)

PPE by Category ($/in-district FTE pupil) — Weighted Averages

Table 7

Category	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025
Other	$461	$476	$561	$482	$547	$533	$511	$569	$573	$536	$634	$596	$906	$1,017	$1,026	$1,174	$981
Guidance, Counseling and Testing	$369	$385	$394	$418	$437	$458	$472	$482	$521	$534	$540	$594	$673	$726	$796	$810	$886
Administration	$488	$514	$505	$528	$571	$571	$609	$647	$661	$690	$637	$681	$732	$768	$825	$892	$926
Instructional Leadership	$888	$900	$897	$1,040	$1,069	$1,087	$1,115	$1,153	$1,136	$1,064	$1,061	$1,111	$1,193	$1,260	$1,360	$1,548	$1,567
Operations and Maintenance	$1,146	$1,080	$1,142	$1,097	$1,132	$1,194	$1,225	$1,202	$1,220	$1,197	$1,316	$1,364	$1,547	$1,645	$1,824	$1,922	$1,965
Other Teaching Services	$1,019	$1,086	$1,123	$1,152	$1,231	$1,315	$1,365	$1,408	$1,437	$1,582	$1,657	$1,688	$1,888	$2,116	$2,258	$2,355	$2,480
Pupil Services	$1,362	$1,328	$1,392	$1,372	$1,481	$1,540	$1,637	$1,714	$1,693	$1,871	$1,927	$1,805	$2,010	$2,226	$2,541	$2,773	$2,830
Insurance, Retirement and Other	$2,461	$2,534	$2,710	$2,723	$2,731	$2,937	$3,070	$3,238	$3,253	$3,566	$3,574	$3,721	$4,107	$4,104	$4,389	$4,620	$5,054
Teachers	$4,788	$4,886	$5,047	$5,046	$5,125	$5,322	$5,459	$5,518	$5,611	$5,867	$6,148	$6,270	$6,655	$6,649	$7,032	$7,288	$7,472
Total	$12,982	$13,190	$13,772	$13,860	$14,323	$14,959	$15,464	$15,931	$16,105	$16,906	$17,494	$17,829	$19,710	$20,511	$22,051	$23,382	$24,160

FTE Enrollment

Table 8

FTE Series	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025
In-District FTE Pupils	1,481	1,448	1,428	1,409	1,391	1,338	1,311	1,285	1,280	1,263	1,281	1,266	1,178	1,199	1,183	1,174	1,156
Foundation Enrollment	1,568	1,534	1,503	1,465	1,447	1,424	1,400	1,381	1,355	1,339	1,358	1,343	1,325	1,254	1,259	1,236	1,225
Out-of-District FTE Pupils	164	172	177	177	177	179	190	199	199	206	212	207	198	197	199	198	184

NSS/Ch70 Funding Components ($/foundation enrollment pupil) — Weighted Averages

Table 9

Component	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025
Ch70 Aid	$6K	$6K	$5K	$6K	$6K	$6K	$6K	$6K	$6K	$7K	$7K	$7K	$7K	$7K	$8K	$8K	$9K
Req NSS (minus Ch70)	$3K	$4K	$4K	$5K	$5K	$5K	$5K	$5K	$6K	$6K	$6K	$6K	$6K	$7K	$7K	$7K	$8K
Actual NSS (minus Req NSS)	$2K	$1K	$2K	$2K	$2K	$2K	$2K	$2K	$2K	$3K	$3K	$3K	$3K	$4K	$4K	$4K	$4K
Total NSS	$11K	$11K	$11K	$12K	$12K	$13K	$13K	$14K	$14K	$15K	$15K	$16K	$16K	$18K	$18K	$20K	$21K

Cohort Composition (FY2025):

Medium (801-1600 FTE): 16 districts (Cohort 3: median to Q3) **Member districts:** amherst, amherst-pelham, athol-royalston, berkshire hills, central berkshire, easthampton, gill-montague, greenfield, hoosac valley regional, mohawk trail, monson, mount greylock, north adams, palmer, southwick-tolland-granville regional school district, and 1 others

Data: All Western MA Traditional Districts: Large (1601-10K FTE)

PPE ($/in-district FTE pupil), FTE Enrollment, and NSS/Ch70 Funding ($/foundation enrollment pupil)

PPE by Category ($/in-district FTE pupil) — Weighted Averages

Table 10

Category	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025
Other	$515	$656	$615	$620	$662	$641	$618	$647	$672	$671	$728	$724	$984	$1,095	$1,354	$1,364	$1,153
Guidance, Counseling and Testing	$399	$394	$415	$406	$422	$442	$451	$452	$452	$483	$513	$538	$596	$666	$743	$744	$765
Administration	$391	$414	$426	$436	$440	$461	$482	$494	$482	$496	$453	$503	$537	$571	$612	$647	$668
Instructional Leadership	$810	$858	$859	$850	$828	$882	$909	$932	$956	$939	$996	$1,026	$1,055	$1,151	$1,194	$1,230	$1,278
Operations and Maintenance	$1,011	$992	$1,010	$982	$985	$1,024	$1,092	$1,101	$1,111	$1,153	$1,245	$1,242	$1,403	$1,451	$1,695	$1,691	$2,013
Other Teaching Services	$987	$1,032	$1,094	$1,097	$1,178	$1,226	$1,287	$1,361	$1,384	$1,394	$1,409	$1,436	$1,569	$1,727	$1,961	$2,024	$2,221
Pupil Services	$1,123	$1,128	$1,190	$1,189	$1,262	$1,344	$1,385	$1,462	$1,486	$1,577	$1,648	$1,583	$1,570	$1,984	$2,203	$2,392	$2,542
Insurance, Retirement and Other	$1,902	$1,940	$2,038	$2,099	$2,088	$2,267	$2,348	$2,401	$2,528	$2,645	$2,771	$2,855	$3,027	$3,206	$3,385	$3,486	$3,694
Teachers	$4,617	$4,597	$4,699	$4,863	$4,997	$5,074	$5,207	$5,412	$5,502	$5,595	$5,894	$6,068	$6,494	$6,832	$7,057	$7,345	$7,517
Total	$11,757	$12,013	$12,347	$12,543	$12,862	$13,359	$13,780	$14,262	$14,572	$14,952	$15,658	$15,976	$17,235	$18,681	$20,204	$20,922	$21,851

FTE Enrollment

Table 11

FTE Series	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025
In-District FTE Pupils	4,178	4,129	4,113	4,032	3,994	3,941	3,901	3,849	3,862	3,848	3,780	3,758	3,547	3,566	3,523	3,513	3,475
Foundation Enrollment	4,281	4,246	4,211	4,187	4,145	4,104	4,067	4,044	3,989	3,983	3,954	3,939	3,898	3,744	3,709	3,686	3,673
Out-of-District FTE Pupils	207	219	234	244	250	265	286	302	311	317	338	345	345	345	360	364	348

NSS/Ch70 Funding Components ($/foundation enrollment pupil) — Weighted Averages

Table 12

Component	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025
Ch70 Aid	$5K	$5K	$5K	$5K	$6K	$6K	$6K	$6K	$6K	$6K	$6K	$7K	$7K	$8K	$8K	$9K	$10K
Req NSS (minus Ch70)	$4K	$4K	$4K	$4K	$5K	$5K	$5K	$5K	$5K	$5K	$5K	$5K	$5K	$6K	$6K	$6K	$7K
Actual NSS (minus Req NSS)	$930	$797	$957	$996	$1K	$1K	$1K	$2K	$2K	$2K	$2K	$2K	$2K	$2K	$2K	$2K	$3K
Total NSS	$10K	$10K	$10K	$11K	$11K	$12K	$12K	$12K	$13K	$13K	$14K	$14K	$15K	$16K	$17K	$18K	$19K

Cohort Composition (FY2025):

Large (1601-10K FTE): 13 districts (Cohort 4: above Q3) **Member districts:** agawam, belchertown, chicopee, east longmeadow, hampden-wilbraham, holyoke, longmeadow, ludlow, northampton, pittsfield, south hadley, west springfield, westfield

Data: All Western MA Traditional Districts: Outliers (Springfield at 23,847 FTE in 2025)

PPE ($/in-district FTE pupil), FTE Enrollment, and NSS/Ch70 Funding ($/foundation enrollment pupil)

PPE by Category ($/in-district FTE pupil) — Weighted Averages

Table 13

Category	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025
Other	$1,143	$1,337	$2,068	$1,143	$1,424	$1,734	$1,241	$1,376	$1,286	$1,371	$1,673	$1,765	$2,487	$2,260	$2,923	$3,071	$2,792
Guidance, Counseling and Testing	$380	$362	$427	$388	$400	$405	$408	$389	$391	$438	$469	$483	$513	$522	$621	$697	$732
Administration	$533	$654	$446	$645	$550	$677	$596	$580	$507	$490	$416	$407	$441	$501	$599	$609	$823
Instructional Leadership	$719	$778	$892	$1,173	$1,257	$1,245	$1,208	$1,282	$1,280	$1,060	$983	$1,090	$1,103	$1,402	$1,534	$1,571	$1,509
Operations and Maintenance	$1,150	$1,081	$1,262	$1,176	$1,132	$997	$1,121	$1,027	$1,063	$1,156	$1,337	$1,093	$1,534	$1,536	$3,453	$3,806	$2,616
Other Teaching Services	$1,143	$1,002	$1,146	$1,130	$1,051	$1,086	$1,150	$1,135	$1,070	$1,036	$1,357	$1,390	$1,337	$1,518	$1,776	$2,014	$2,249
Pupil Services	$1,651	$1,511	$1,729	$1,965	$1,783	$1,852	$1,985	$2,078	$2,222	$2,407	$2,499	$2,148	$2,077	$3,080	$3,054	$3,202	$3,383
Insurance, Retirement and Other	$2,050	$2,226	$2,280	$2,474	$2,437	$2,496	$2,467	$2,566	$2,562	$2,635	$2,765	$3,001	$3,217	$3,461	$3,852	$3,905	$4,165
Teachers	$5,839	$4,859	$4,750	$4,711	$4,848	$4,823	$4,963	$5,196	$4,962	$5,274	$5,510	$5,800	$6,442	$7,095	$7,561	$7,737	$7,784
Total	$14,608	$13,810	$15,000	$14,805	$14,882	$15,315	$15,139	$15,629	$15,343	$15,867	$17,009	$17,177	$19,151	$21,375	$25,373	$26,612	$26,053

FTE Enrollment

Table 14

FTE Series	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025
In-District FTE Pupils	25,137	24,987	24,935	24,521	24,747	25,249	25,101	25,009	25,629	25,776	25,294	24,906	24,079	24,040	23,763	23,723	23,847
Foundation Enrollment	28,235	28,343	28,305	28,226	27,951	28,434	28,755	28,970	29,109	29,533	29,670	29,645	29,551	29,144	28,613	28,326	28,394
Out-of-District FTE Pupils	3,571	3,775	3,719	3,695	3,817	3,613	3,974	4,406	4,596	4,812	5,150	5,363	5,559	5,500	5,652	5,745	5,692

NSS/Ch70 Funding Components ($/foundation enrollment pupil) — Weighted Averages

Table 15

Component	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025
Ch70 Aid	$9K	$9K	$9K	$10K	$10K	$10K	$10K	$11K	$11K	$11K	$12K	$13K	$13K	$14K	$15K	$17K	$18K
Req NSS (minus Ch70)	$247	$1K	$2K	$1K	$1K	$1K	$1K	$1K	$1K	$1K	$1K	$1K	$2K	$1K	$2K	$2K	$2K
Actual NSS (minus Req NSS)	$-150	$-384	$-35	$-84	$-144	$0	$2	$2	$-0	$-106	$-0	$-499	$0	$0	$-0	$-0	$7
Total NSS	$9K	$10K	$11K	$11K	$11K	$12K	$12K	$12K	$12K	$12K	$13K	$13K	$15K	$15K	$17K	$19K	$20K

Cohort Composition (FY2025):

Outliers (Springfield >10K FTE): 1 district (Cohort 5: statistical outlier, analyzed separately) **Member districts:** springfield

Data: All Western MA Traditional Districts: All Western MA (excl. Springfield)

PPE ($/in-district FTE pupil), FTE Enrollment, and NSS/Ch70 Funding ($/foundation enrollment pupil)

PPE by Category ($/in-district FTE pupil)

Table 16

Category	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025
Other	$507	$589	$591	$573	$621	$600	$578	$620	$632	$624	$683	$668	$964	$1,040	$1,234	$1,278	$1,106
Guidance, Counseling and Testing	$387	$393	$407	$413	$430	$448	$460	$469	$481	$504	$532	$562	$634	$697	$763	$777	$815
Administration	$440	$461	$471	$488	$506	$519	$544	$565	$588	$580	$544	$587	$629	$669	$713	$751	$790
Instructional Leadership	$834	$866	$871	$904	$908	$950	$980	$1,012	$1,022	$995	$1,029	$1,071	$1,124	$1,204	$1,264	$1,352	$1,398
Operations and Maintenance	$1,064	$1,027	$1,055	$1,032	$1,051	$1,103	$1,155	$1,157	$1,159	$1,183	$1,299	$1,299	$1,483	$1,564	$1,787	$1,838	$2,027
Other Teaching Services	$1,023	$1,071	$1,131	$1,138	$1,229	$1,281	$1,338	$1,409	$1,445	$1,505	$1,552	$1,579	$1,713	$1,891	$2,092	$2,188	$2,365
Pupil Services	$1,220	$1,210	$1,271	$1,279	$1,372	$1,437	$1,486	$1,574	$1,579	$1,680	$1,752	$1,680	$1,743	$2,096	$2,336	$2,561	$2,686
Insurance, Retirement and Other	$2,074	$2,114	$2,237	$2,290	$2,309	$2,481	$2,577	$2,678	$2,807	$2,959	$3,054	$3,150	$3,396	$3,507	$3,722	$3,875	$4,158
Teachers	$4,661	$4,687	$4,806	$4,922	$5,078	$5,192	$5,329	$5,496	$5,606	$5,740	$6,012	$6,189	$6,626	$6,872	$7,121	$7,421	$7,630
Total	$12,210	$12,417	$12,840	$13,038	$13,503	$14,011	$14,447	$14,980	$15,319	$15,771	$16,457	$16,785	$18,312	$19,539	$21,030	$22,041	$22,976

FTE Enrollment

Table 17

FTE Series	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025
In-District FTE Pupils	1,472	1,453	1,440	1,413	1,391	1,361	1,342	1,300	1,299	1,289	1,280	1,268	1,188	1,200	1,186	1,179	1,145
Foundation Enrollment	1,463	1,443	1,425	1,405	1,387	1,366	1,350	1,335	1,312	1,304	1,300	1,292	1,277	1,220	1,214	1,202	1,194
Out-of-District FTE Pupils	114	119	122	124	127	131	139	143	145	148	154	153	150	151	154	154	137

NSS/Ch70 Funding Components ($/foundation enrollment pupil)

Table 18

Component	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025
Ch70 Aid	$5K	$5K	$5K	$5K	$5K	$6K	$6K	$6K	$6K	$6K	$6K	$7K	$7K	$7K	$8K	$9K	$9K
Req NSS (minus Ch70)	$4K	$4K	$5K	$5K	$5K	$5K	$5K	$5K	$5K	$5K	$6K	$6K	$6K	$6K	$7K	$7K	$7K
Actual NSS (minus Req NSS)	$1K	$1K	$1K	$1K	$1K	$2K	$2K	$2K	$2K	$3K	$3K	$3K	$3K	$3K	$3K	$3K	$4K
Total NSS	$10K	$11K	$11K	$11K	$12K	$12K	$13K	$13K	$14K	$14K	$15K	$15K	$16K	$17K	$18K	$19K	$20K

Data: Amherst-Pelham

PPE ($/in-district FTE pupil), FTE Enrollment, and NSS/Ch70 Funding ($/foundation enrollment pupil)

PPE by Category ($/in-district FTE pupil)

Table 19

Category	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025
Other	$646	$534	$900	$417	$459	$424	$599	$860	$635	$384	$610	$559	$477	$527	$457	$799	$453
Guidance, Counseling and Testing	$525	$580	$617	$684	$652	$733	$778	$798	$803	$891	$925	$945	$1,001	$1,241	$1,406	$1,465	$1,471
Administration	$652	$664	$687	$789	$987	$907	$953	$926	$996	$857	$759	$780	$788	$859	$928	$1,277	$1,435
Instructional Leadership	$1,289	$1,337	$1,209	$1,397	$1,390	$1,545	$1,429	$1,437	$1,541	$1,555	$1,544	$1,501	$1,436	$1,472	$1,644	$2,336	$1,794
Operations and Maintenance	$1,459	$1,416	$1,559	$1,468	$1,481	$1,585	$1,473	$1,577	$1,904	$1,678	$1,776	$1,601	$1,705	$1,778	$1,957	$2,221	$2,168
Other Teaching Services	$1,199	$1,264	$1,313	$1,468	$1,588	$1,739	$1,770	$1,883	$2,014	$2,066	$2,122	$2,214	$3,010	$3,050	$2,968	$2,851	$2,862
Pupil Services	$1,645	$1,616	$1,588	$1,618	$1,639	$1,764	$1,975	$2,110	$2,128	$2,218	$2,236	$1,957	$2,950	$2,539	$2,771	$2,766	$3,039
Insurance, Retirement and Other	$3,305	$3,636	$3,673	$3,811	$3,526	$3,954	$4,086	$4,103	$4,218	$5,006	$5,047	$5,074	$5,237	$5,062	$5,887	$6,248	$6,677
Teachers	$5,491	$5,511	$6,254	$6,199	$6,533	$6,765	$6,704	$6,590	$6,927	$7,208	$7,285	$7,155	$7,592	$7,404	$8,158	$8,270	$8,000
Total	$16,211	$16,558	$17,800	$17,851	$18,255	$19,416	$19,767	$20,284	$21,166	$21,863	$22,304	$21,786	$24,196	$23,932	$26,176	$28,233	$27,899

FTE Enrollment

Table 20

FTE Series	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025
In-District FTE Pupils	1,712	1,659	1,573	1,536	1,519	1,470	1,450	1,378	1,366	1,342	1,334	1,346	1,278	1,265	1,241	1,209	1,189
Foundation Enrollment	1,801	1,763	1,726	1,647	1,610	1,581	1,529	1,532	1,496	1,490	1,433	1,399	1,399	1,330	1,310	1,274	1,241
Out-of-District FTE Pupils	112	129	138	143	138	149	169	190	192	170	158	152	155	145	150	147	127

NSS/Ch70 Funding Components ($/foundation enrollment pupil)

Table 21

Component	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025
Ch70 Aid	$5K	$5K	$5K	$6K	$6K	$6K	$6K	$6K	$6K	$6K	$7K	$7K	$7K	$7K	$7K	$8K	$8K
Req NSS (minus Ch70)	$4K	$6K	$6K	$7K	$7K	$7K	$8K	$8K	$8K	$8K	$8K	$9K	$9K	$10K	$10K	$11K	$12K
Actual NSS (minus Req NSS)	$3K	$2K	$3K	$3K	$4K	$4K	$4K	$4K	$5K	$5K	$5K	$5K	$5K	$5K	$5K	$6K	$7K
Total NSS	$13K	$14K	$14K	$16K	$17K	$17K	$18K	$18K	$19K	$19K	$20K	$21K	$21K	$22K	$23K	$25K	$26K

Data: Amherst

PPE ($/in-district FTE pupil), FTE Enrollment, and NSS/Ch70 Funding ($/foundation enrollment pupil)

PPE by Category ($/in-district FTE pupil)

Table 22

Category	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025
Other	$684	$547	$606	$931	$1,098	$1,098	$1,265	$1,242	$1,119	$798	$1,092	$733	$1,563	$1,561	$1,475	$1,328	$1,120
Guidance, Counseling and Testing	$396	$383	$362	$411	$469	$538	$545	$583	$599	$631	$668	$696	$830	$891	$1,093	$1,053	$1,203
Administration	$627	$698	$735	$709	$787	$809	$919	$944	$981	$799	$767	$827	$874	$896	$981	$1,213	$1,158
Instructional Leadership	$1,134	$1,079	$965	$1,032	$1,153	$1,275	$1,175	$1,131	$1,087	$1,231	$1,325	$1,527	$1,750	$1,783	$1,847	$2,498	$2,253
Operations and Maintenance	$1,264	$1,271	$1,636	$1,436	$1,399	$1,451	$1,577	$1,530	$1,555	$1,340	$1,646	$1,764	$1,897	$1,874	$1,941	$2,248	$2,238
Other Teaching Services	$1,762	$1,813	$1,923	$2,345	$2,621	$2,610	$2,840	$2,652	$2,751	$2,973	$3,084	$3,053	$3,908	$3,898	$3,746	$4,612	$4,176
Pupil Services	$865	$1,003	$973	$975	$1,084	$1,223	$1,257	$1,267	$1,219	$1,278	$1,362	$1,148	$1,205	$1,849	$1,728	$1,965	$1,827
Insurance, Retirement and Other	$3,353	$3,610	$3,821	$3,852	$3,941	$4,189	$4,201	$4,295	$4,231	$4,840	$5,212	$5,363	$5,661	$5,561	$6,022	$6,605	$6,498
Teachers	$5,944	$6,213	$6,355	$6,963	$6,804	$6,627	$6,841	$7,712	$7,792	$8,091	$8,538	$8,725	$9,528	$9,598	$9,451	$9,745	$9,511
Total	$16,029	$16,617	$17,376	$18,654	$19,356	$19,820	$20,620	$21,356	$21,334	$21,981	$23,694	$23,836	$27,216	$27,911	$28,284	$31,267	$29,984

FTE Enrollment

Table 23

FTE Series	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025
In-District FTE Pupils	1,387	1,331	1,284	1,215	1,196	1,197	1,184	1,154	1,156	1,163	1,131	1,107	1,017	1,052	1,062	1,002	1,081
Foundation Enrollment	1,398	1,405	1,356	1,279	1,269	1,227	1,205	1,192	1,199	1,136	1,106	1,134	1,097	1,045	1,065	1,055	984
Out-of-District FTE Pupils	65	72	73	84	90	90	101	113	110	108	124	122	118	123	129	134	133

NSS/Ch70 Funding Components ($/foundation enrollment pupil)

Table 24

Component	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025
Ch70 Aid	$4K	$4K	$4K	$5K	$5K	$5K	$5K	$5K	$5K	$5K	$6K	$5K	$6K	$6K	$6K	$6K	$6K
Req NSS (minus Ch70)	$4K	$6K	$6K	$7K	$7K	$7K	$7K	$8K	$8K	$8K	$8K	$8K	$9K	$9K	$10K	$11K	$11K
Actual NSS (minus Req NSS)	$6K	$5K	$5K	$6K	$6K	$6K	$7K	$8K	$8K	$9K	$10K	$9K	$9K	$11K	$11K	$11K	$13K
Total NSS	$15K	$15K	$16K	$17K	$17K	$18K	$19K	$20K	$20K	$22K	$23K	$23K	$24K	$26K	$26K	$28K	$30K

Data: Leverett

PPE ($/in-district FTE pupil), FTE Enrollment, and NSS/Ch70 Funding ($/foundation enrollment pupil)

PPE by Category ($/in-district FTE pupil)

Table 25

Category	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025
Other	$575	$602	$651	$766	$616	$556	$563	$529	$596	$453	$503	$606	$1,041	$840	$756	$608	$2,352
Guidance, Counseling and Testing	$310	$306	$314	$350	$354	$412	$292	$304	$323	$355	$351	$362	$498	$790	$659	$666	$865
Administration	$715	$676	$710	$888	$925	$1,029	$809	$842	$1,244	$899	$826	$857	$1,010	$987	$1,061	$953	$1,071
Instructional Leadership	$1,015	$1,008	$1,072	$1,244	$1,257	$1,393	$1,357	$1,344	$1,431	$1,461	$1,278	$1,317	$1,318	$1,354	$1,430	$1,663	$1,895
Operations and Maintenance	$1,755	$1,427	$1,532	$1,741	$1,479	$2,421	$2,272	$1,707	$1,209	$1,765	$1,491	$1,458	$2,131	$2,296	$2,292	$2,158	$2,307
Other Teaching Services	$2,385	$2,040	$2,074	$2,346	$2,540	$2,352	$2,274	$2,281	$2,193	$2,175	$2,477	$2,386	$2,178	$3,119	$3,266	$3,526	$4,062
Pupil Services	$1,085	$664	$782	$1,249	$1,259	$1,980	$1,781	$1,397	$1,759	$1,726	$1,494	$1,279	$2,192	$1,120	$1,976	$2,148	$1,900
Insurance, Retirement and Other	$2,098	$2,041	$2,253	$2,499	$2,753	$3,245	$3,041	$2,937	$2,943	$3,677	$3,781	$3,686	$4,766	$3,630	$3,611	$3,793	$3,891
Teachers	$5,218	$5,690	$5,818	$6,301	$6,138	$7,547	$6,868	$6,967	$6,814	$7,967	$7,665	$7,134	$9,224	$6,888	$6,724	$6,395	$5,389
Total	$15,156	$14,454	$15,206	$17,384	$17,321	$20,935	$19,257	$18,308	$18,512	$20,478	$19,866	$19,085	$24,358	$21,024	$21,775	$21,910	$23,732

FTE Enrollment

Table 26

FTE Series	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025
In-District FTE Pupils	162	164	161	150	147	124	134	135	134	129	136	142	117	142	140	142	137
Foundation Enrollment	125	120	123	123	119	118	100	104	101	123	103	112	116	105	112	101	105
Out-of-District FTE Pupils	7	7	6	9	10	9	8	6	14	8	9	12	9	12	7	3	2

NSS/Ch70 Funding Components ($/foundation enrollment pupil)

Table 27

Component	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025
Ch70 Aid	$2K	$2K	$2K	$2K	$2K	$2K	$3K	$3K	$3K	$2K	$3K	$3K	$3K	$3K	$3K	$4K	$4K
Req NSS (minus Ch70)	$7K	$7K	$8K	$8K	$8K	$8K	$8K	$8K	$8K	$8K	$8K	$8K	$9K	$9K	$9K	$9K	$10K
Actual NSS (minus Req NSS)	$7K	$7K	$7K	$8K	$9K	$8K	$10K	$10K	$10K	$8K	$11K	$11K	$10K	$13K	$10K	$11K	$11K
Total NSS	$16K	$17K	$17K	$17K	$19K	$18K	$21K	$21K	$21K	$18K	$23K	$22K	$21K	$25K	$22K	$24K	$25K

Data: Pelham

PPE ($/in-district FTE pupil), FTE Enrollment, and NSS/Ch70 Funding ($/foundation enrollment pupil)

PPE by Category ($/in-district FTE pupil)

Table 28

Category	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025
Other	$580	$361	$384	$366	$658	$639	$780	$652	$569	$414	$466	$407	$292	$365	$422	$207	$181
Guidance, Counseling and Testing	$438	$449	$459	$449	$617	$664	$696	$683	$682	$499	$499	$582	$795	$772	$775	$1,855	$1,044
Administration	$390	$398	$478	$391	$664	$796	$806	$980	$739	$731	$489	$574	$656	$688	$614	$917	$905
Instructional Leadership	$1,123	$1,159	$1,089	$1,064	$1,113	$1,252	$1,288	$1,322	$1,278	$1,431	$1,194	$1,609	$1,670	$1,873	$1,782	$1,885	$1,479
Operations and Maintenance	$920	$847	$925	$884	$992	$947	$1,080	$942	$987	$889	$1,229	$1,304	$1,498	$1,380	$1,524	$1,614	$1,674
Other Teaching Services	$2,184	$2,109	$2,166	$2,026	$1,937	$2,063	$2,218	$2,541	$2,850	$2,269	$2,273	$2,324	$2,540	$2,292	$2,594	$3,010	$2,786
Pupil Services	$594	$641	$888	$1,058	$967	$951	$1,000	$1,114	$1,092	$1,173	$1,233	$1,060	$1,317	$1,431	$1,113	$1,755	$1,503
Insurance, Retirement and Other	$2,615	$2,585	$2,602	$2,897	$3,052	$3,283	$3,376	$3,473	$3,863	$4,561	$3,791	$4,168	$4,850	$4,157	$3,983	$4,670	$4,965
Teachers	$5,889	$5,474	$5,627	$5,576	$5,035	$6,090	$6,540	$6,418	$5,904	$6,310	$6,129	$6,860	$7,406	$6,714	$6,430	$7,127	$7,036
Total	$14,733	$14,023	$14,618	$14,711	$15,035	$16,685	$17,784	$18,125	$17,964	$18,277	$17,303	$18,888	$21,024	$19,672	$19,237	$23,040	$21,573

FTE Enrollment

Table 29

FTE Series	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025
In-District FTE Pupils	118	125	122	128	132	128	123	123	130	127	134	125	106	119	134	126	129
Foundation Enrollment	85	81	81	68	63	67	70	73	74	81	83	82	84	70	65	63	63
Out-of-District FTE Pupils	3	3	4	1	4	7	5	7	11	12	10	4	8	6	5	9	9

NSS/Ch70 Funding Components ($/foundation enrollment pupil)

Table 30

Component	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025
Ch70 Aid	$3K	$3K	$3K	$3K	$3K	$3K	$3K	$3K	$3K	$3K	$3K	$3K	$3K	$3K	$4K	$4K	$4K
Req NSS (minus Ch70)	$5K	$6K	$6K	$7K	$8K	$8K	$9K	$9K	$8K	$8K	$8K	$8K	$8K	$9K	$10K	$10K	$11K
Actual NSS (minus Req NSS)	$8K	$8K	$8K	$10K	$12K	$10K	$9K	$10K	$12K	$12K	$11K	$11K	$13K	$16K	$19K	$20K	$20K
Total NSS	$16K	$17K	$17K	$20K	$23K	$22K	$21K	$22K	$23K	$23K	$22K	$23K	$24K	$29K	$32K	$34K	$35K

Data: Shutesbury

PPE ($/in-district FTE pupil), FTE Enrollment, and NSS/Ch70 Funding ($/foundation enrollment pupil)

PPE by Category ($/in-district FTE pupil)

Table 31

Category	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025
Other	$580	$498	$564	$865	$704	$515	$636	$684	$1,510	$420	$385	$873	$1,296	$551	$1,102	$545	$602
Guidance, Counseling and Testing	$302	$328	$345	$334	$345	$344	$354	$434	$318	$546	$542	$383	$519	$1,393	$697	$826	$847
Administration	$652	$943	$767	$836	$877	$726	$884	$1,084	$1,040	$846	$856	$938	$925	$1,100	$934	$1,015	$958
Instructional Leadership	$969	$1,138	$1,149	$1,198	$1,227	$1,003	$1,192	$1,517	$1,604	$1,481	$1,517	$1,541	$1,707	$1,736	$1,323	$2,103	$2,028
Operations and Maintenance	$1,180	$1,079	$1,221	$1,276	$1,251	$1,338	$1,384	$1,637	$1,791	$1,941	$1,663	$1,916	$2,665	$2,048	$2,051	$2,754	$2,493
Other Teaching Services	$2,185	$2,447	$2,361	$2,193	$2,179	$2,591	$2,164	$2,817	$3,301	$3,491	$3,545	$3,560	$3,722	$5,320	$3,441	$4,359	$4,378
Pupil Services	$990	$800	$850	$1,222	$1,283	$1,074	$1,073	$906	$1,847	$1,755	$1,664	$1,815	$1,937	$1,355	$2,249	$2,136	$2,064
Insurance, Retirement and Other	$2,332	$2,687	$2,596	$2,690	$2,564	$2,484	$2,328	$3,107	$3,773	$4,388	$2,970	$3,963	$3,350	$3,154	$4,007	$3,501	$3,248
Teachers	$4,821	$5,363	$5,603	$5,169	$5,509	$6,012	$5,620	$6,612	$7,043	$7,838	$7,914	$8,204	$8,933	$10,075	$8,898	$10,144	$10,771
Total	$14,011	$15,283	$15,456	$15,783	$15,939	$16,087	$15,635	$18,798	$22,227	$22,706	$21,056	$23,193	$25,054	$26,732	$24,702	$27,383	$27,389

FTE Enrollment

Table 32

FTE Series	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025
In-District FTE Pupils	162	151	146	151	150	157	156	131	120	124	127	125	113	115	123	110	125
Foundation Enrollment	156	149	141	138	143	132	141	146	118	116	118	117	105	98	100	111	99
Out-of-District FTE Pupils	7	5	7	10	9	13	9	12	13	16	18	15	16	18	19	18	16

NSS/Ch70 Funding Components ($/foundation enrollment pupil)

Table 33

Component	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025
Ch70 Aid	$4K	$4K	$4K	$4K	$4K	$4K	$4K	$4K	$5K	$5K	$5K	$5K	$6K	$6K	$6K	$6K	$7K
Req NSS (minus Ch70)	$4K	$5K	$5K	$5K	$5K	$5K	$5K	$5K	$5K	$6K	$6K	$6K	$7K	$7K	$7K	$7K	$8K
Actual NSS (minus Req NSS)	$4K	$5K	$6K	$6K	$6K	$7K	$7K	$6K	$9K	$10K	$10K	$12K	$12K	$15K	$13K	$10K	$15K
Total NSS	$13K	$14K	$15K	$15K	$15K	$17K	$16K	$15K	$20K	$22K	$21K	$23K	$25K	$29K	$26K	$24K	$30K

Appendix D. Maps from previous years

Scatterplot of enrollment vs. per-pupil expenditure (2024)

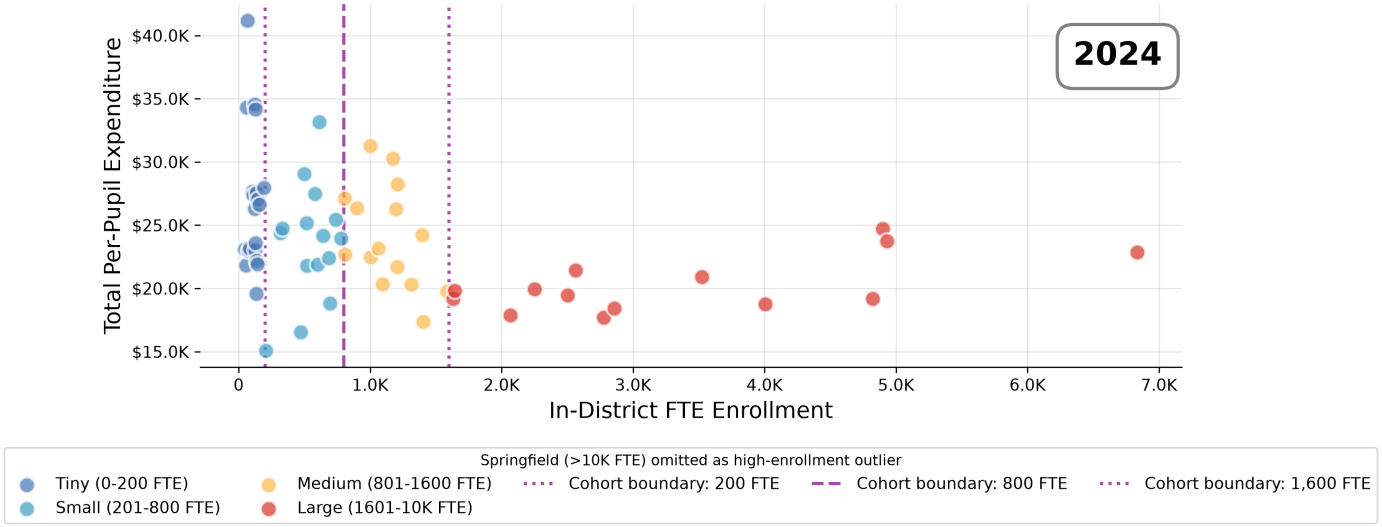
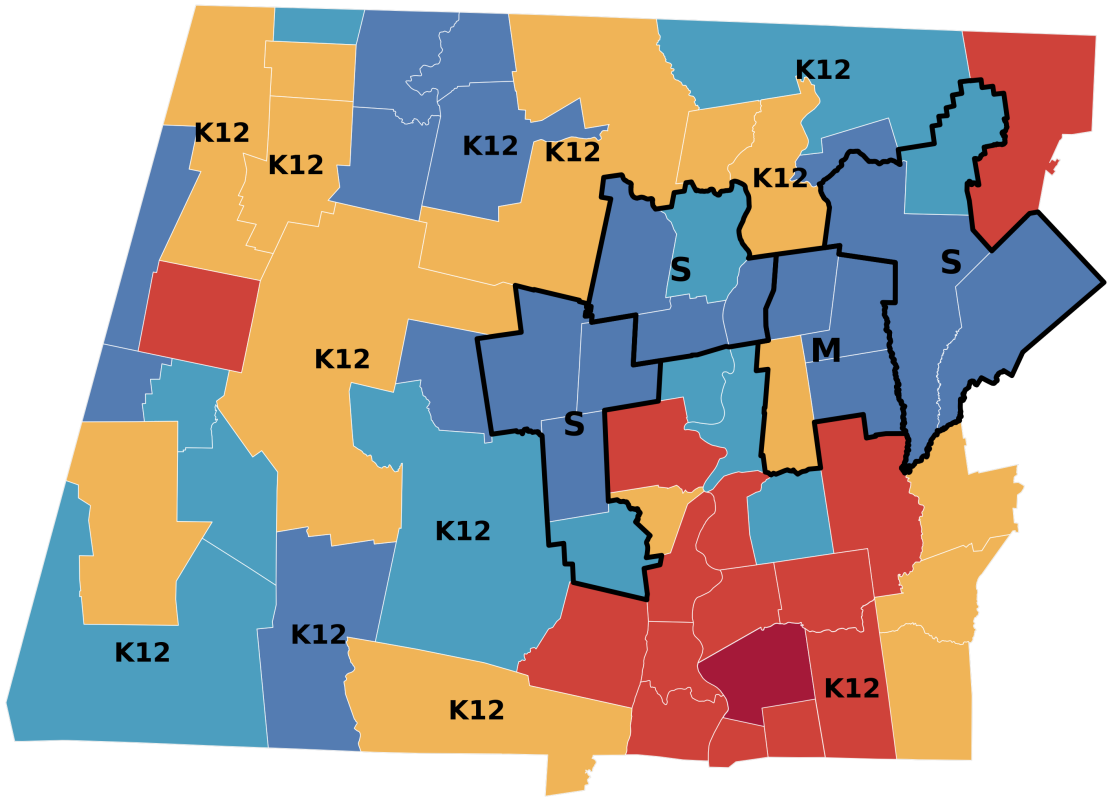


Figure 1

Appendix D. Maps from previous years (continued)

Geographic map showing district locations and enrollment cohorts (2024)



Enrollment Cohorts - 2024

- Tiny (0-200 FTE): 20 district(s)
- Small (201-800 FTE): 15 district(s)
- Medium (801-1600 FTE): 15 district(s)
- Large (1601-10K FTE): 14 district(s)
- Outliers (Springfield >10K FTE): 1 district(s)

Secondary regional (black border)
Cohort: T, S, M, L, XL
K12 = Regional K-12 with all grade levels in a single district

Figure 2

Appendix D. Maps from previous years (continued)

Geographic map showing 2024 PPE vs enrollment cohort baseline

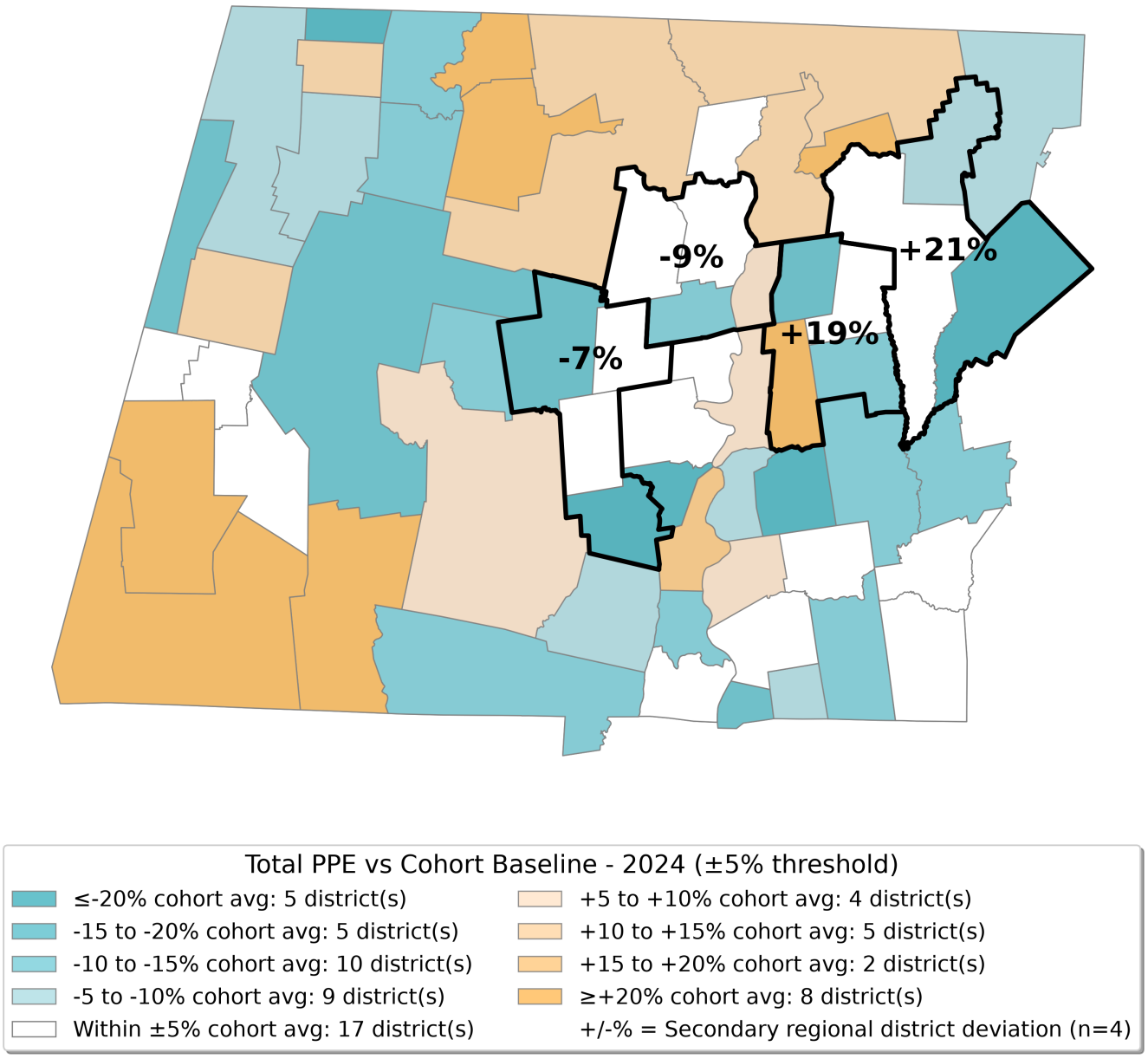


Figure 3

Appendix D. Maps from previous years (continued)

Geographic map showing 15-year PPE growth (2009-2024) vs enrollment cohort baseline

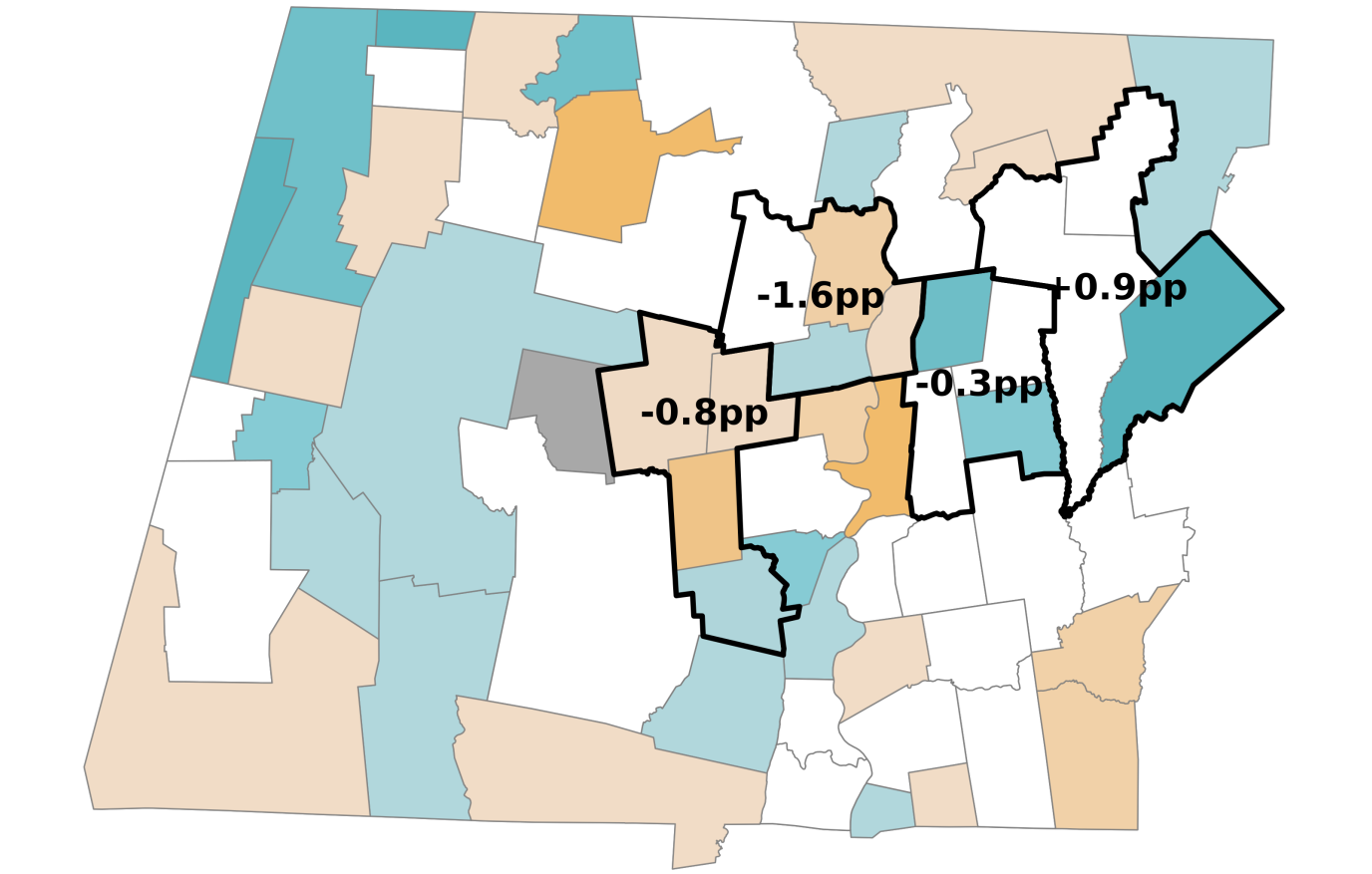


Figure 4

Appendix D. Maps from previous years (continued)

Geographic map showing district locations and enrollment cohorts (2020)

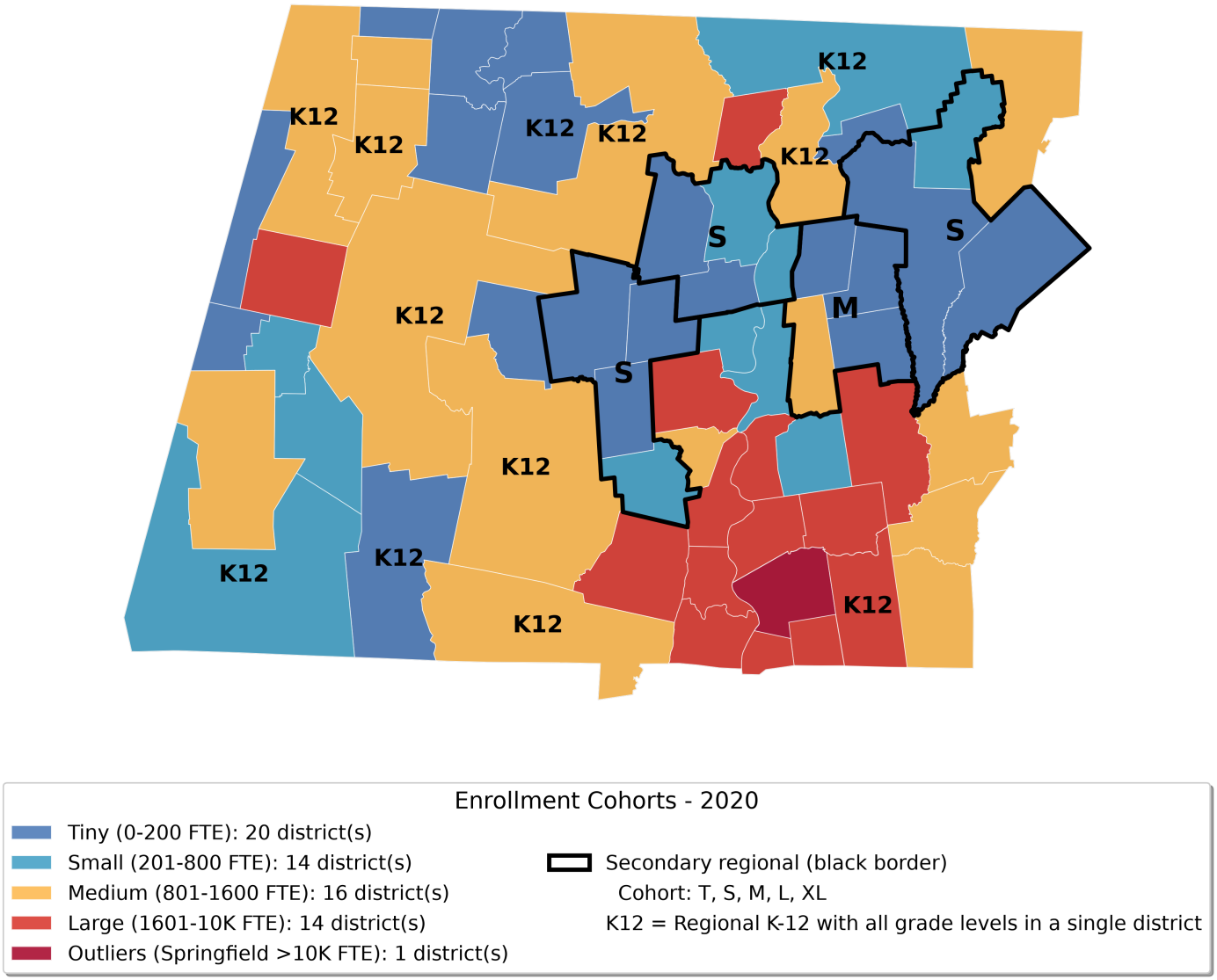


Figure 5

Appendix D. Maps from previous years (continued)

Geographic map showing 2020 PPE vs enrollment cohort baseline

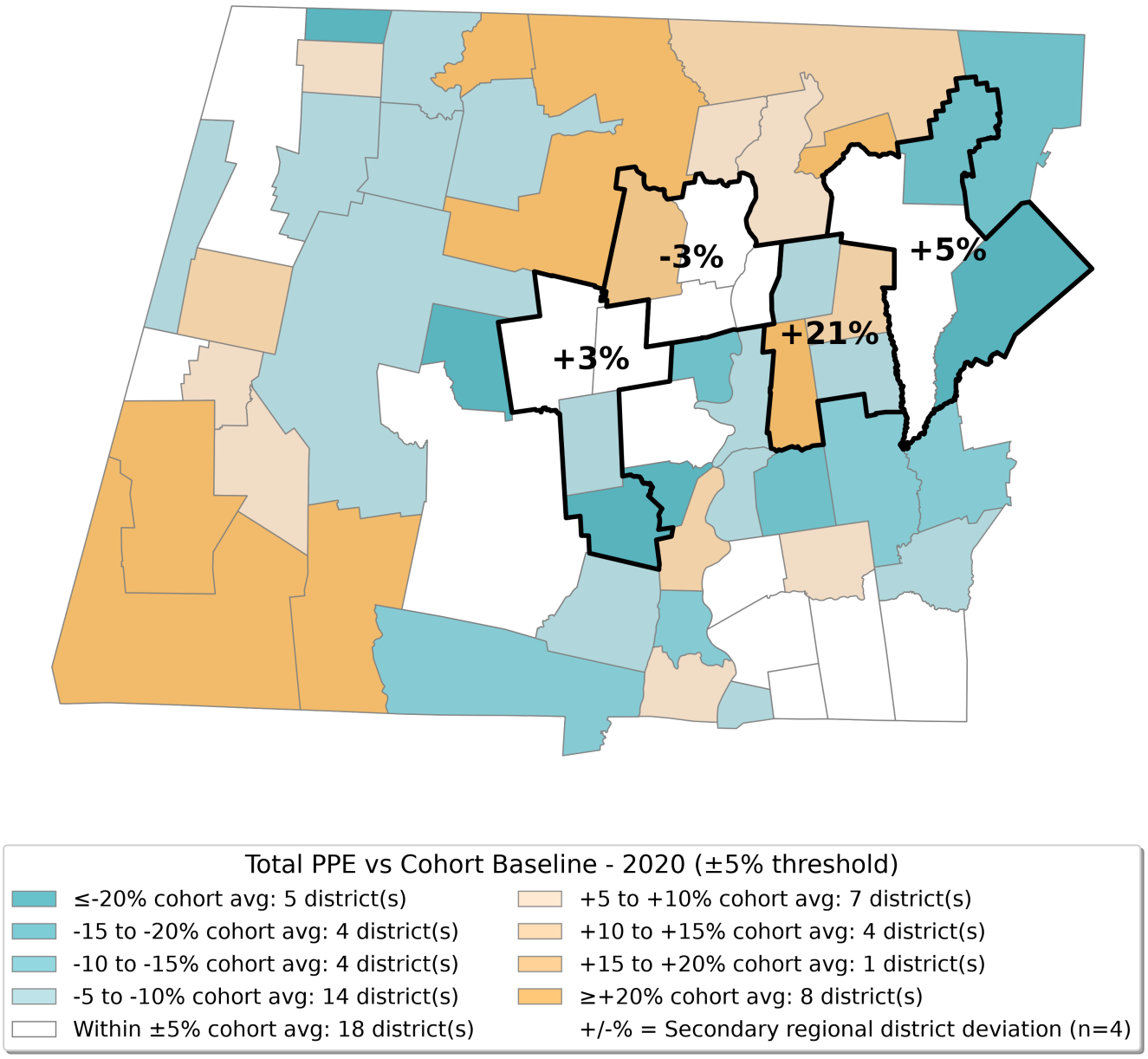
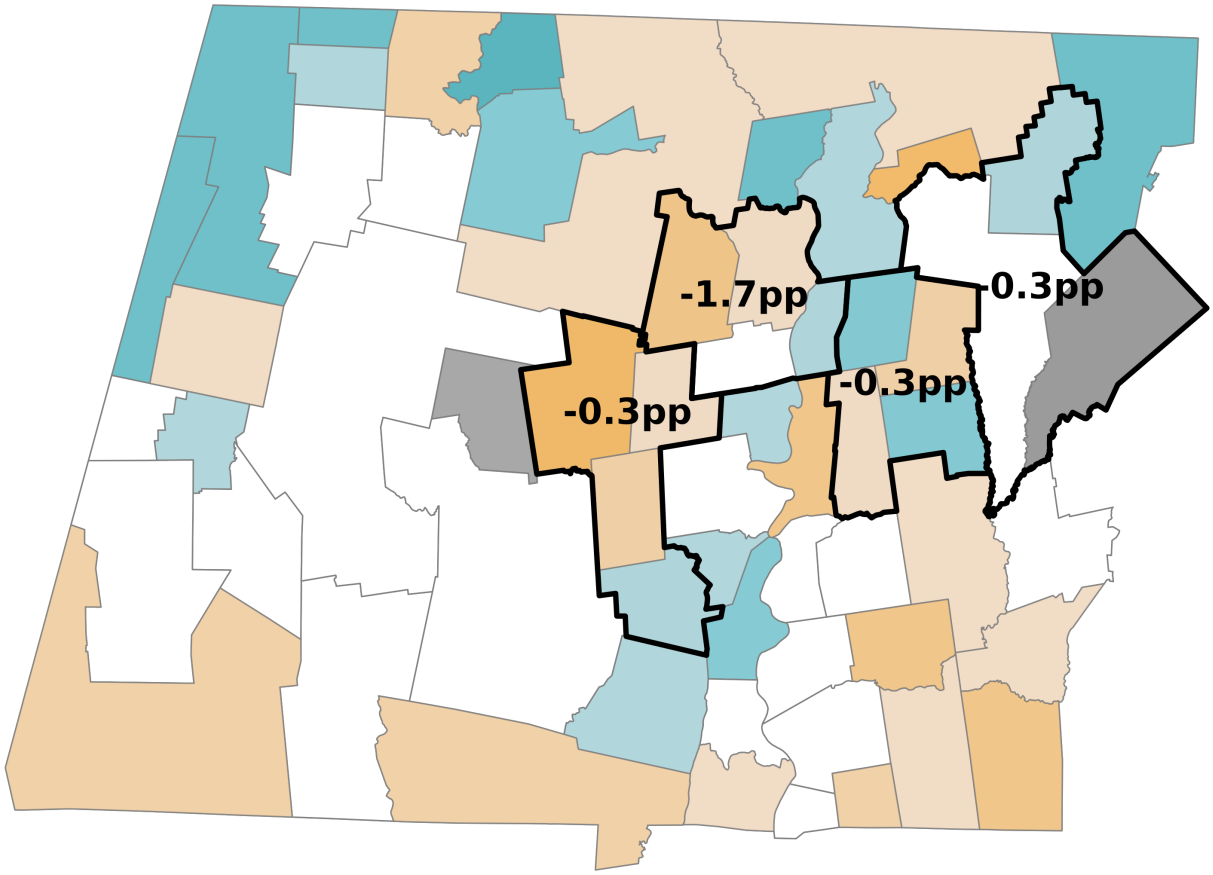


Figure 6

Appendix D. Maps from previous years (continued)

Geographic map showing 11-year PPE growth (2009-2020) vs enrollment cohort baseline



Total PPE CAGR vs Cohort Baseline - 2009 to 2020 (±0.5pp threshold)

- ≤-2.0pp than cohort: 1 district(s)
- -1.5 to -2.0pp than cohort: 6 district(s)
- -1.0 to -1.5pp than cohort: 4 district(s)
- -0.5 to -1.0pp than cohort: 9 district(s)
- Within ±0.5pp than cohort: 21 district(s)
- +0.5 to +1.0pp than cohort: 10 district(s)
- +1.0 to +1.5pp than cohort: 6 district(s)
- +1.5 to +2.0pp than cohort: 4 district(s)
- ≥+2.0pp than cohort: 2 district(s)
- +/-pp = Secondary regional district deviation (n=4)

Figure 7

Appendix D. Maps from previous years (continued)

Geographic map showing district locations and enrollment cohorts (2015)

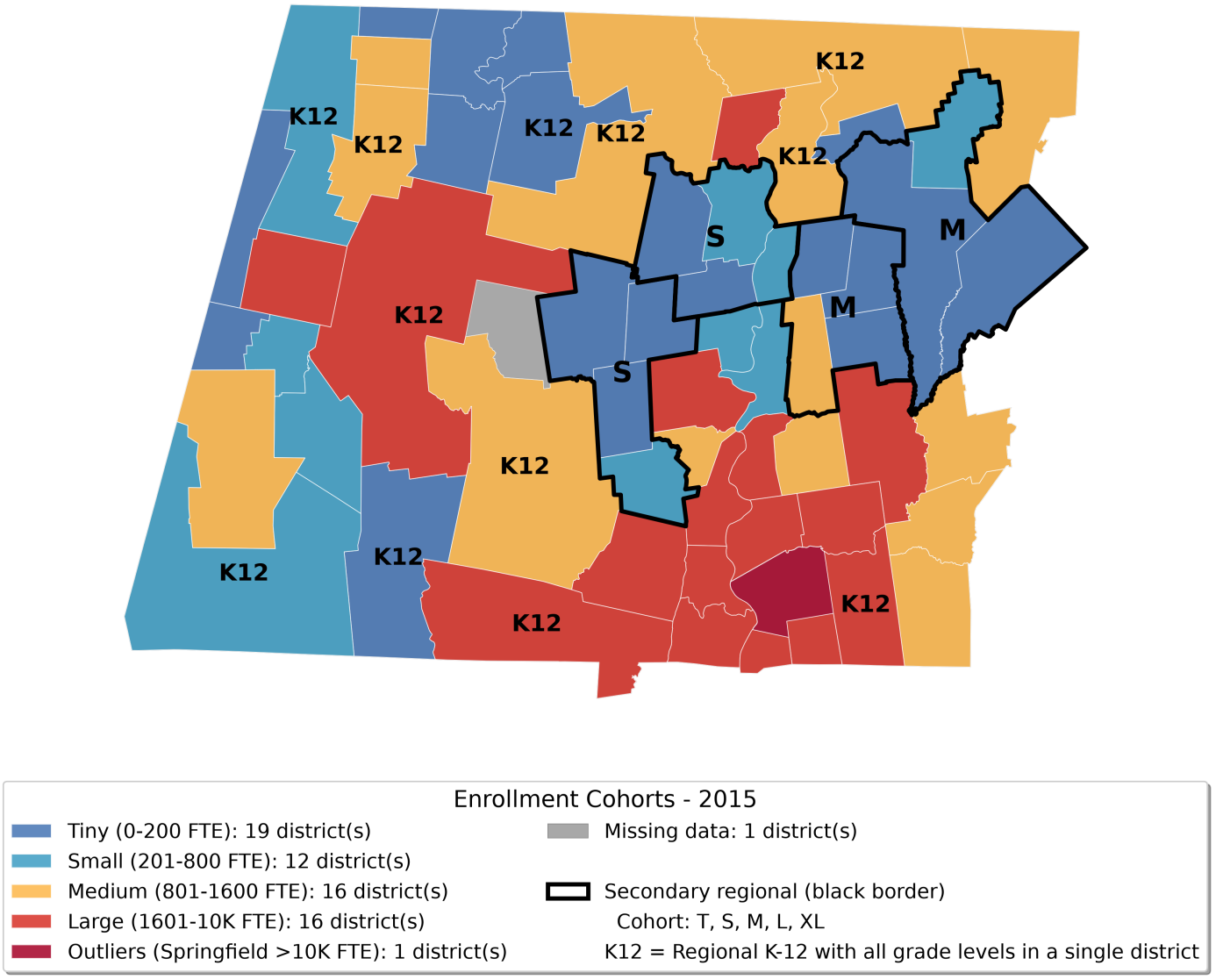


Figure 8

Appendix D. Maps from previous years (continued)

Geographic map showing 2015 PPE vs enrollment cohort baseline

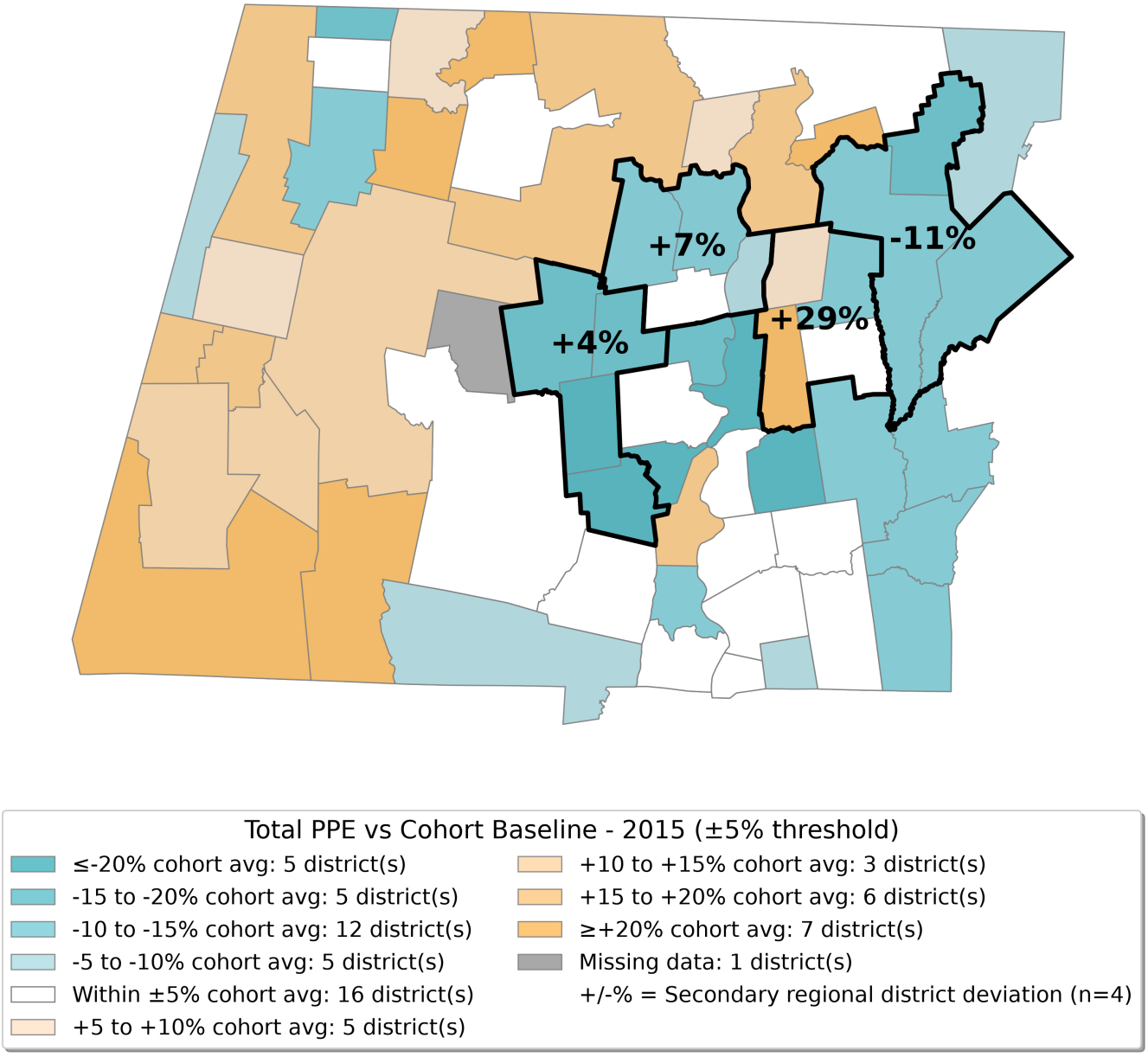


Figure 9

Appendix D. Maps from previous years (continued)

Geographic map showing 6-year PPE growth (2009-2015) vs enrollment cohort baseline

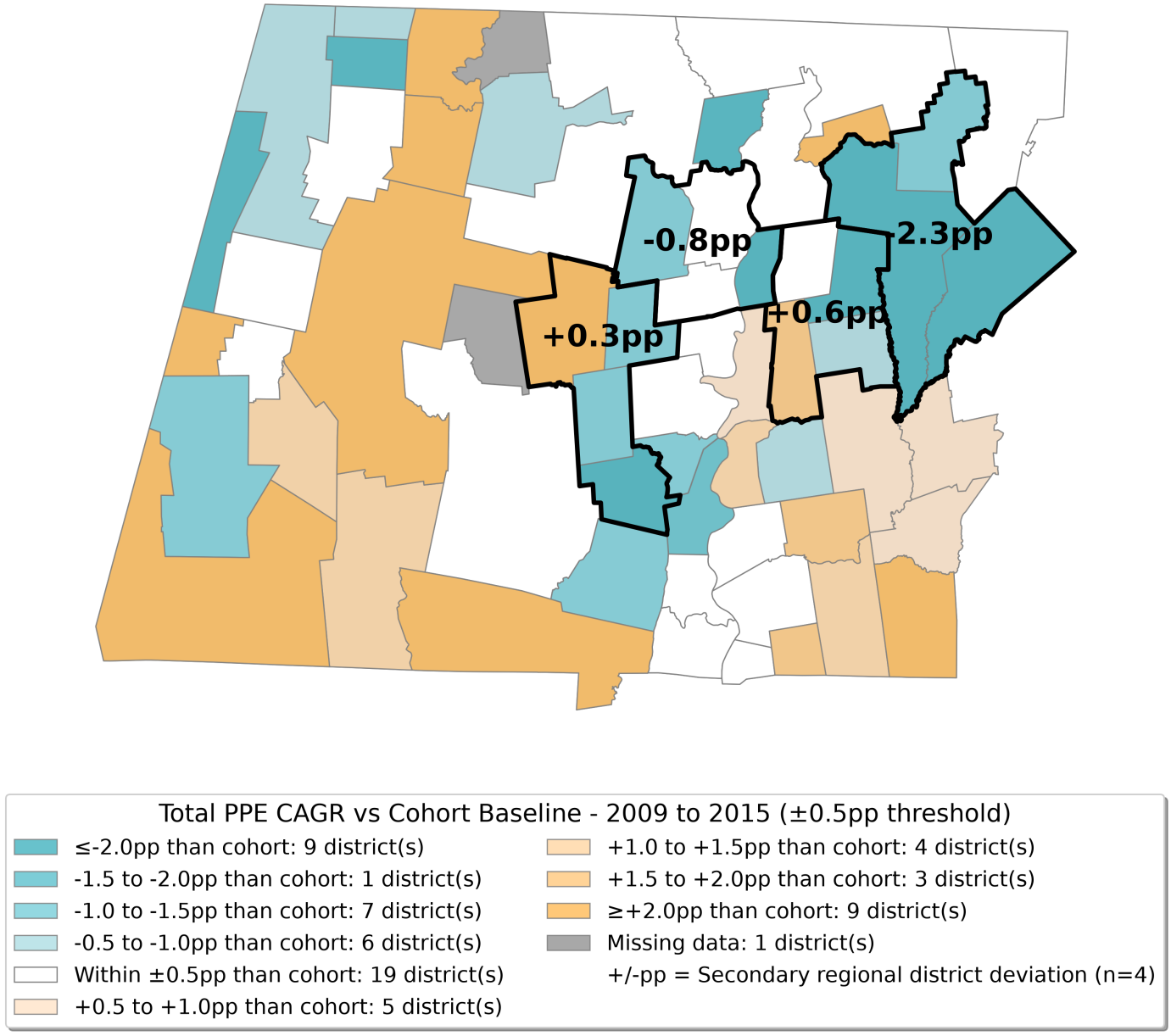


Figure 10

Appendix D. Maps from previous years (continued)

Geographic map showing district locations and enrollment cohorts (2009)

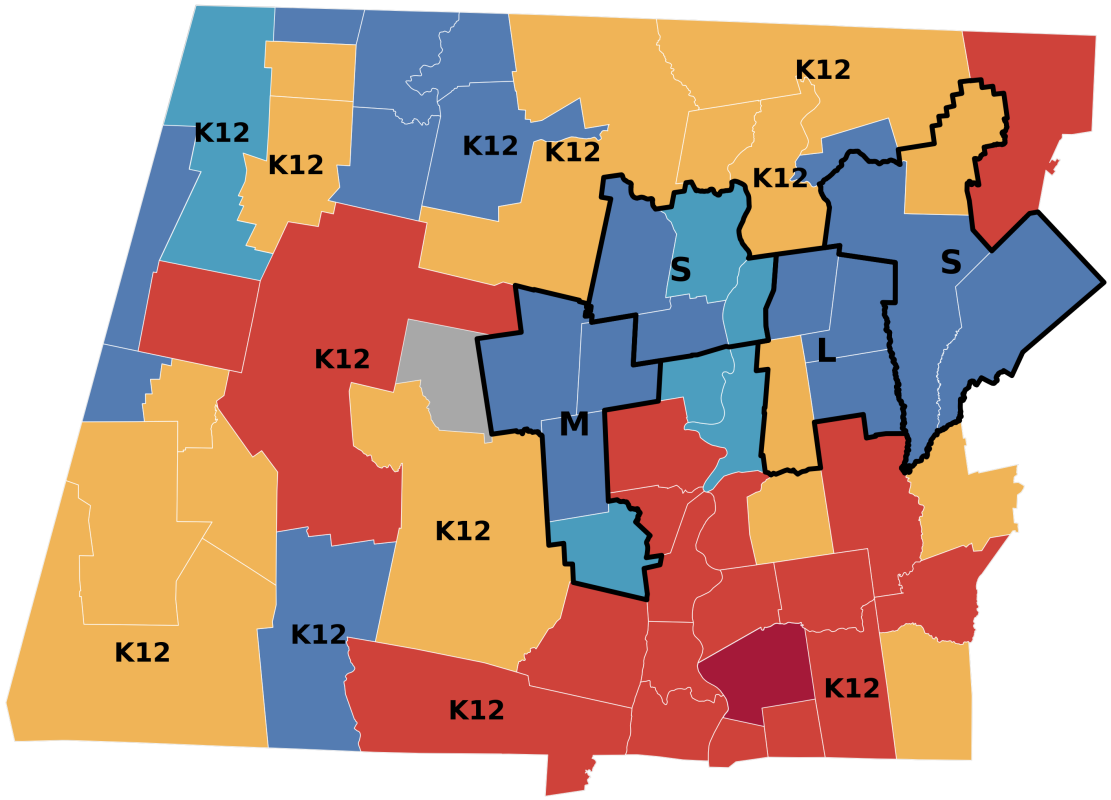


Figure 11

Appendix D. Maps from previous years (continued)

Geographic map showing 2009 PPE vs enrollment cohort baseline

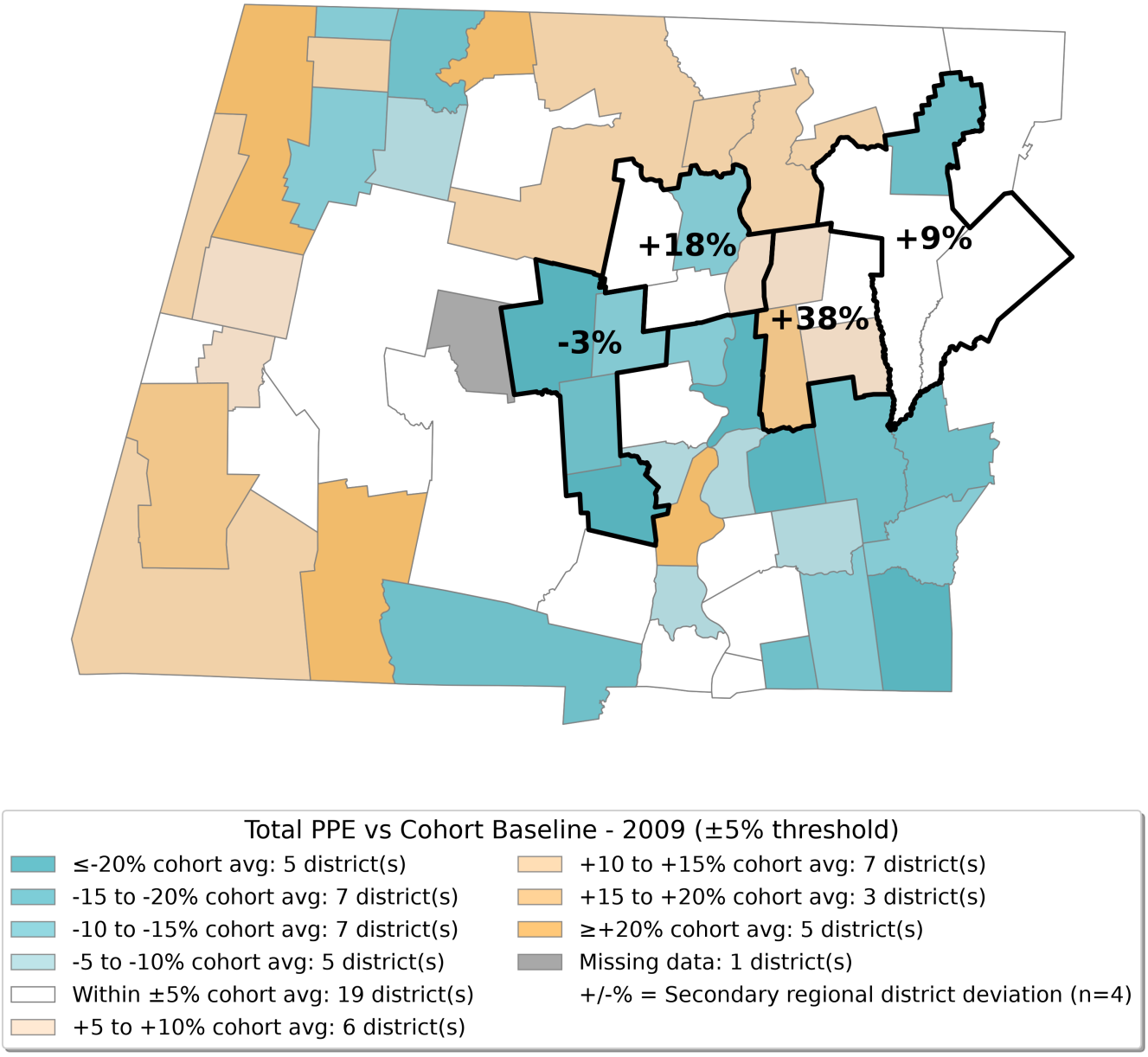


Figure 12