

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 12, 2025

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 = $c70aid / \text{foundation enrollment}$
- Required local contribution (\$/pupil) = $\max(0, rqnss2 - c70aid) / \text{foundation enrollment}$
- Actual local contribution above required (\$/pupil) = $(\text{actualNSS} - rqnss2) / \text{foundation enrollment}$

Total NSS per foundation pupil = Sum of all three components = $\text{actualNSS} / \text{foundation enrollment}$

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): <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: $CAGR = (\text{End_Value} / \text{Start_Value})^{(1 / \text{Years})} - 1$

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: $\text{Weighted_PPE} = \Sigma(\text{District_PPE} \times \text{District_FTE}) / \Sigma(\text{District_FTE})$

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):** 17 districts (Cohort 1: below Q1) **Member districts:** conway, erving, farmington river reg, florida, hancock, hawlemont, leverett, new salem-wendell, pelham, petersham, richmond, rowe, savoy, shutesbury, sunderland, and 2 others
- **Small (201-800 FTE):** 13 districts (Cohort 2: Q1 to median) **Member districts:** clarksburg, deerfield, frontier, gateway, granby, hadley, hatfield, lee, lenox, orange, pioneer valley, ralph c mahar, southern berkshire
- **Medium (801-1600 FTE):** 15 districts (Cohort 3: median to Q3) **Member districts:** amherst, amherst-pelham, 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, ware
- **Large (1601-10K FTE):** 14 districts (Cohort 4: above Q3) **Member districts:** agawam, athol-royalston, 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 (2024 values)

- Threshold: $\geq 5.0\%$ difference from baseline
- Calculation: $(\text{District} - \text{Baseline}) / \text{Baseline}$
- Shading intensity bins: 5%, 10%, 15%, 20%+

Test 2: Growth rates (CAGR)

- Threshold: ≥ 0.5 percentage points (pp) difference from baseline
- Calculation: $\text{District_CAGR} - \text{Baseline_CAGR}$
- 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 $\geq \$1,212$ at mean (~ 0.22 SD)
- 0.5pp for CAGR: Flags differences ≥ 0.5 pp (~ 0.15 SD)
- Balance ratio: $0.7\times$ (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: $(\$3,179 \div \$13,032) \times 100 = 24.4\%$ above cohort

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

District CAGR:

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

Medium cohort CAGR:

- $CAGR = (\$23,785 \div \$13,032)^{(1/15)} - 1 = (1.82525)^{(0.06667)} - 1 = 1.0409 - 1 = 4.09\%$ 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: $(\$4,448 \div \$23,785) \times 100 = 18.7\%$ 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:

- $CAGR = (\$23,785 \div \$13,032)^{(1/15)} - 1 = CAGR = (1.82525)^{(0.06667)} - 1 = 1.0409 - 1 = 4.09\%$ 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

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: $PPE(2024) = \beta_0 + \beta_1 \times \ln(\text{Enrollment}) + \beta_2 \times PPE(2009) + \beta_3 \times \text{ActualNSS} + \varepsilon$
 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: $PPE(2024) = \beta_0 + \beta_1 \times \text{Enrollment CAGR (2009-2024)} + \varepsilon$
- 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: $PPE(2024) = \beta_0 + \beta_1 \times \text{Enrollment CAGR} + \beta_2 \times PPE(2009) + \beta_3 \times \text{Current Enrollment} + \varepsilon$

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: $PPE\ CAGR(2009-2024) = \beta_0 + \beta_1 \times \text{Enrollment CAGR}(2009-2024) + \varepsilon$
- 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 ($\pm 0.5\%$ 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: $\text{PPE CAGR} = \beta_0 + \beta_1 \times \text{Enrollment CAGR} + \beta_2 \times \text{PPE}(2009) + \beta_3 \times \text{Ch70 CAGR} + \varepsilon$

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: $PPE(2024) = \beta_0 + \beta_1 \times \text{Chapter 70 per pupil}(2024) + \varepsilon$
- 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: $PPE(2024) = \beta_0 + \beta_1 \times Ch70PerPupil + \beta_2 \times LocalContribution + \beta_3 \times \ln(Enrollment) + \varepsilon$

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: $PPE(2024) = \beta_0 + \beta_1 \times \text{Chapter 70 CAGR}(2009-2024) + \varepsilon$
- 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: $PPE(2024) = \beta_0 + \beta_1 \times Ch70CAGR + \beta_2 \times LocalInvestCAGR + \beta_3 \times PPE(2009) + \varepsilon$

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: $PPE(2024) = \beta_0 + \beta_1 \times Local\ Investment\ per\ pupil(2024) + \varepsilon$
- 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: $PPE(2024) = \beta_0 + \beta_1 \times LocalInvestment + \beta_2 \times Ch70PerPupil + \beta_3 \times \ln(Enrollment) + \epsilon$

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: $PPE(2024) = \beta_0 + \beta_1 \times Actual\ NSS\ above\ Required\ NSS\ CAGR(2009-2024) + \epsilon$
- 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: $PPE(2024) = \beta_0 + \beta_1 \times LocalInvestCAGR + \beta_2 \times LocalInvest(2009) + \beta_3 \times PPE(2009) + \epsilon$

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
Other	\$577	\$571	\$623	\$643	\$647	\$665	\$676	\$709	\$780	\$579	\$673	\$738	\$1,380	\$1,042	\$1,304	\$1,057
Guidance, Counseling and Testing	\$345	\$365	\$375	\$402	\$419	\$462	\$475	\$454	\$445	\$448	\$459	\$488	\$577	\$663	\$621	\$674
Administration	\$770	\$808	\$814	\$853	\$915	\$851	\$774	\$819	\$863	\$869	\$770	\$833	\$950	\$1,003	\$1,114	\$1,126
Instructional Leadership	\$1,042	\$1,096	\$1,125	\$1,225	\$1,269	\$1,316	\$1,496	\$1,584	\$1,510	\$1,524	\$1,543	\$1,589	\$1,817	\$1,733	\$1,777	\$1,991
Operations and Maintenance	\$1,374	\$1,312	\$1,460	\$1,416	\$1,359	\$1,558	\$1,554	\$1,452	\$1,433	\$1,468	\$1,811	\$1,670	\$2,060	\$2,389	\$2,232	\$2,652
Other Teaching Services	\$1,899	\$1,926	\$1,987	\$2,112	\$2,412	\$2,378	\$2,494	\$2,635	\$2,673	\$2,707	\$3,004	\$3,115	\$3,322	\$3,677	\$3,638	\$3,757
Pupil Services	\$1,324	\$1,427	\$1,426	\$1,497	\$1,605	\$1,599	\$1,670	\$1,753	\$1,846	\$1,813	\$1,864	\$1,716	\$2,119	\$2,010	\$2,334	\$2,732
Insurance, Retirement and Other	\$2,258	\$2,405	\$2,595	\$2,737	\$2,926	\$3,148	\$3,125	\$3,143	\$3,905	\$3,390	\$3,662	\$3,769	\$4,357	\$4,048	\$4,506	\$5,009
Teachers	\$5,148	\$5,382	\$5,545	\$5,277	\$5,430	\$5,906	\$6,187	\$6,222	\$6,245	\$6,520	\$6,792	\$6,982	\$8,015	\$7,858	\$7,808	\$8,507
Total	\$14,738	\$15,291	\$15,950	\$16,161	\$16,981	\$17,882	\$18,452	\$18,770	\$19,700	\$19,319	\$20,577	\$20,900	\$24,596	\$24,423	\$25,334	\$27,504

FTE Enrollment

Table 2

FTE Series	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024
In-District FTE Pupils	131	127	125	125	123	120	122	116	121	123	122	122	107	115	114	113
Foundation Enrollment	123	120	116	109	109	108	107	111	108	107	105	102	101	91	93	94
Out-of-District FTE Pupils	41	41	41	37	40	38	37	39	38	36	35	33	31	34	34	32

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
Ch70 Aid	\$3K	\$3K	\$3K	\$4K	\$4K	\$4K	\$4K	\$4K	\$4K	\$4K	\$4K	\$4K	\$4K	\$5K	\$5K	\$5K
Req NSS (minus Ch70)	\$6K	\$6K	\$6K	\$7K	\$7K	\$7K	\$7K	\$8K	\$8K	\$8K	\$8K	\$8K	\$9K	\$9K	\$9K	\$10K
Actual NSS (minus Req NSS)	\$5K	\$4K	\$5K	\$5K	\$6K	\$6K	\$6K	\$6K	\$8K	\$8K	\$10K	\$10K	\$10K	\$12K	\$12K	\$12K
Total NSS	\$13K	\$14K	\$15K	\$16K	\$17K	\$17K	\$17K	\$18K	\$20K	\$20K	\$22K	\$22K	\$23K	\$26K	\$26K	\$27K

Cohort Composition (FY2024):

Tiny (0-200 FTE): 17 districts (Cohort 1: below Q1) **Member districts:** conway, erving, farmington river reg, florida, hancock, hawlemont, leverett, new salem-wendell, pelham, petersham, richmond, rowe, savoy, shutesbury, sunderland, and 2 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
Other	\$558	\$505	\$540	\$533	\$585	\$515	\$503	\$583	\$539	\$596	\$558	\$512	\$915	\$777	\$1,064	\$1,150
Guidance, Counseling and Testing	\$392	\$422	\$418	\$456	\$483	\$482	\$501	\$564	\$588	\$600	\$669	\$662	\$807	\$864	\$896	\$961
Administration	\$523	\$515	\$567	\$601	\$648	\$665	\$701	\$739	\$999	\$752	\$788	\$802	\$854	\$942	\$948	\$976
Instructional Leadership	\$811	\$805	\$838	\$824	\$909	\$947	\$967	\$1,024	\$1,028	\$1,042	\$1,016	\$1,097	\$1,188	\$1,260	\$1,336	\$1,463
Operations and Maintenance	\$1,108	\$1,056	\$1,043	\$1,101	\$1,198	\$1,264	\$1,295	\$1,338	\$1,254	\$1,285	\$1,473	\$1,422	\$1,676	\$1,878	\$2,176	\$2,454
Other Teaching Services	\$1,061	\$1,089	\$1,193	\$1,151	\$1,289	\$1,311	\$1,353	\$1,446	\$1,575	\$1,718	\$1,799	\$1,806	\$1,779	\$1,899	\$2,151	\$2,402
Pupil Services	\$1,421	\$1,366	\$1,441	\$1,537	\$1,733	\$1,739	\$1,714	\$1,913	\$1,850	\$1,870	\$1,974	\$2,007	\$2,097	\$2,569	\$2,760	\$3,122
Insurance, Retirement and Other	\$2,128	\$2,107	\$2,230	\$2,317	\$2,486	\$2,568	\$2,711	\$2,955	\$3,219	\$3,345	\$3,362	\$3,420	\$3,734	\$3,801	\$3,969	\$4,254
Teachers	\$4,522	\$4,588	\$4,679	\$4,870	\$5,353	\$5,423	\$5,557	\$5,771	\$6,026	\$6,075	\$6,152	\$6,450	\$6,922	\$7,338	\$7,596	\$7,838
Total	\$12,523	\$12,453	\$12,949	\$13,388	\$14,684	\$14,916	\$15,302	\$16,333	\$17,077	\$17,283	\$17,791	\$18,177	\$19,972	\$21,330	\$22,896	\$24,622

FTE Enrollment

Table 5

FTE Series	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024
In-District FTE Pupils	775	779	763	742	696	680	661	644	628	614	617	601	560	556	553	542
Foundation Enrollment	695	676	666	646	628	603	590	559	542	536	528	526	522	494	484	481
Out-of-District FTE Pupils	75	78	73	73	80	82	86	82	85	88	90	88	85	87	87	84

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
Ch70 Aid	\$4K	\$4K	\$4K	\$4K	\$4K	\$4K	\$4K	\$5K	\$5K	\$5K	\$5K	\$5K	\$5K	\$6K	\$6K	\$6K
Req NSS (minus Ch70)	\$5K	\$6K	\$6K	\$6K	\$6K	\$7K	\$7K	\$7K	\$7K	\$7K	\$7K	\$7K	\$8K	\$8K	\$9K	\$9K
Actual NSS (minus Req NSS)	\$2K	\$2K	\$2K	\$2K	\$2K	\$2K	\$3K	\$4K	\$4K	\$4K	\$5K	\$5K	\$5K	\$5K	\$6K	\$6K
Total NSS	\$11K	\$11K	\$11K	\$12K	\$13K	\$14K	\$14K	\$15K	\$16K	\$16K	\$17K	\$17K	\$18K	\$19K	\$21K	\$21K

Cohort Composition (FY2024):

Small (201-800 FTE): 13 districts (Cohort 2: Q1 to median) **Member districts:** clarksburg, deerfield, frontier, gateway, granby, hadley, hatfield, lee, lenox, orange, pioneer valley, ralph c mahar, 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
Other	\$461	\$484	\$558	\$494	\$561	\$552	\$524	\$573	\$586	\$534	\$644	\$607	\$930	\$1,064	\$1,055	\$1,200
Guidance, Counseling and Testing	\$373	\$385	\$391	\$418	\$435	\$457	\$470	\$479	\$522	\$536	\$545	\$601	\$677	\$736	\$805	\$826
Administration	\$494	\$521	\$512	\$533	\$575	\$576	\$614	\$653	\$678	\$711	\$653	\$700	\$747	\$785	\$835	\$911
Instructional Leadership	\$893	\$902	\$885	\$1,039	\$1,062	\$1,091	\$1,113	\$1,169	\$1,150	\$1,071	\$1,063	\$1,113	\$1,191	\$1,263	\$1,373	\$1,573
Operations and Maintenance	\$1,150	\$1,085	\$1,155	\$1,095	\$1,146	\$1,208	\$1,233	\$1,218	\$1,228	\$1,203	\$1,326	\$1,383	\$1,564	\$1,663	\$1,836	\$1,953
Other Teaching Services	\$1,014	\$1,078	\$1,100	\$1,135	\$1,235	\$1,317	\$1,362	\$1,400	\$1,444	\$1,596	\$1,681	\$1,729	\$1,936	\$2,180	\$2,311	\$2,395
Pupil Services	\$1,351	\$1,309	\$1,366	\$1,345	\$1,466	\$1,527	\$1,626	\$1,705	\$1,686	\$1,869	\$1,919	\$1,803	\$1,957	\$2,231	\$2,548	\$2,755
Insurance, Retirement and Other	\$2,483	\$2,574	\$2,743	\$2,707	\$2,707	\$2,943	\$3,074	\$3,251	\$3,266	\$3,622	\$3,631	\$3,789	\$4,169	\$4,166	\$4,480	\$4,740
Teachers	\$4,813	\$4,890	\$5,055	\$5,048	\$5,152	\$5,357	\$5,513	\$5,578	\$5,674	\$5,960	\$6,251	\$6,385	\$6,758	\$6,773	\$7,182	\$7,431
Total	\$13,032	\$13,227	\$13,766	\$13,815	\$14,340	\$15,028	\$15,529	\$16,025	\$16,234	\$17,103	\$17,713	\$18,110	\$19,930	\$20,859	\$22,426	\$23,785

FTE Enrollment

Table 8

FTE Series	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024
In-District FTE Pupils	1,466	1,434	1,416	1,402	1,388	1,334	1,306	1,277	1,268	1,247	1,268	1,249	1,160	1,175	1,158	1,144
Foundation Enrollment	1,622	1,596	1,567	1,528	1,509	1,507	1,472	1,451	1,422	1,399	1,381	1,376	1,361	1,289	1,283	1,247
Out-of-District FTE Pupils	154	161	164	164	166	167	176	185	187	194	201	198	190	191	194	194

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
Ch70 Aid	\$5K	\$5K	\$5K	\$5K	\$5K	\$6K	\$6K	\$6K	\$6K	\$6K	\$6K	\$7K	\$7K	\$7K	\$8K	\$8K
Req NSS (minus Ch70)	\$4K	\$5K	\$5K	\$5K	\$5K	\$5K	\$6K	\$6K	\$6K	\$6K	\$6K	\$6K	\$6K	\$7K	\$7K	\$8K
Actual NSS (minus Req NSS)	\$2K	\$1K	\$2K	\$2K	\$2K	\$2K	\$2K	\$2K	\$2K	\$3K	\$3K	\$3K	\$3K	\$3K	\$4K	\$4K
Total NSS	\$11K	\$11K	\$11K	\$12K	\$12K	\$13K	\$13K	\$14K	\$14K	\$15K	\$16K	\$16K	\$16K	\$17K	\$18K	\$20K

Cohort Composition (FY2024):

Medium (801-1600 FTE): 15 districts (Cohort 3: median to Q3) **Member districts:** amherst, amherst-pelham, 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, ware

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
Other	\$513	\$648	\$614	\$611	\$654	\$631	\$610	\$644	\$664	\$667	\$722	\$716	\$972	\$1,075	\$1,331	\$1,348
Guidance, Counseling and Testing	\$397	\$394	\$416	\$407	\$423	\$443	\$452	\$454	\$454	\$483	\$511	\$537	\$597	\$664	\$741	\$740
Administration	\$392	\$415	\$426	\$437	\$441	\$462	\$484	\$496	\$480	\$494	\$453	\$502	\$537	\$571	\$616	\$649
Instructional Leadership	\$811	\$859	\$865	\$856	\$837	\$886	\$915	\$932	\$956	\$940	\$998	\$1,028	\$1,060	\$1,153	\$1,195	\$1,231
Operations and Maintenance	\$1,014	\$993	\$1,009	\$986	\$984	\$1,023	\$1,093	\$1,098	\$1,111	\$1,152	\$1,244	\$1,238	\$1,401	\$1,450	\$1,685	\$1,683
Other Teaching Services	\$990	\$1,037	\$1,103	\$1,105	\$1,177	\$1,228	\$1,290	\$1,365	\$1,383	\$1,395	\$1,407	\$1,429	\$1,561	\$1,717	\$1,951	\$2,021
Pupil Services	\$1,135	\$1,141	\$1,206	\$1,205	\$1,274	\$1,354	\$1,396	\$1,472	\$1,495	\$1,586	\$1,659	\$1,591	\$1,603	\$1,989	\$2,213	\$2,408
Insurance, Retirement and Other	\$1,911	\$1,943	\$2,045	\$2,123	\$2,115	\$2,282	\$2,366	\$2,419	\$2,543	\$2,652	\$2,773	\$2,855	\$3,037	\$3,212	\$3,364	\$3,469
Teachers	\$4,613	\$4,604	\$4,707	\$4,868	\$4,990	\$5,067	\$5,194	\$5,393	\$5,482	\$5,569	\$5,863	\$6,031	\$6,461	\$6,780	\$7,001	\$7,292
Total	\$11,775	\$12,034	\$12,391	\$12,597	\$12,895	\$13,376	\$13,801	\$14,273	\$14,568	\$14,937	\$15,629	\$15,927	\$17,229	\$18,612	\$20,097	\$20,841

FTE Enrollment

Table 11

FTE Series	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024
In-District FTE Pupils	4,001	3,953	3,935	3,852	3,812	3,760	3,721	3,674	3,690	3,680	3,616	3,598	3,397	3,422	3,384	3,379
Foundation Enrollment	4,432	4,382	4,347	4,325	4,280	4,230	4,191	4,163	4,093	4,077	4,037	4,013	3,975	3,823	3,787	3,752
Out-of-District FTE Pupils	215	227	244	253	256	272	293	309	316	322	341	345	344	341	354	357

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
Ch70 Aid	\$6K	\$5K	\$6K	\$6K	\$6K	\$6K	\$6K	\$6K	\$6K	\$7K	\$7K	\$7K	\$7K	\$8K	\$9K	\$10K
Req NSS (minus Ch70)	\$3K	\$4K	\$4K	\$4K	\$4K	\$4K	\$5K	\$5K	\$5K	\$5K	\$5K	\$5K	\$5K	\$5K	\$6K	\$6K
Actual NSS (minus Req NSS)	\$900	\$708	\$901	\$905	\$944	\$1K	\$1K	\$1K	\$2K	\$2K	\$2K	\$2K	\$2K	\$2K	\$2K	\$2K
Total NSS	\$10K	\$10K	\$10K	\$11K	\$11K	\$12K	\$12K	\$12K	\$13K	\$13K	\$14K	\$14K	\$15K	\$16K	\$17K	\$18K

Cohort Composition (FY2024):

Large (1601-10K FTE): 14 districts (Cohort 4: above Q3) **Member districts:** agawam, athol-royalston, 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 23,723 FTE in 2024)

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
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
Guidance, Counseling and Testing	\$380	\$362	\$427	\$388	\$400	\$405	\$408	\$389	\$391	\$438	\$469	\$483	\$513	\$522	\$621	\$697
Administration	\$533	\$654	\$446	\$645	\$550	\$677	\$596	\$580	\$507	\$490	\$416	\$407	\$441	\$501	\$599	\$609
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
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
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
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	\$3,204
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	\$3,906
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
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	\$26,615

FTE Enrollment

Table 14

FTE Series	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024
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
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
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

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
Ch70 Aid	\$9K	\$9K	\$9K	\$10K	\$10K	\$10K	\$10K	\$11K	\$11K	\$11K	\$12K	\$13K	\$13K	\$14K	\$15K	\$17K
Req NSS (minus Ch70)	\$247	\$1K	\$2K	\$1K	\$1K	\$1K	\$1K	\$1K	\$1K	\$1K	\$1K	\$1K	\$2K	\$1K	\$2K	\$2K
Actual NSS (minus Req NSS)	\$-150	\$-384	\$-35	\$-84	\$-144	\$0	\$2	\$2	\$-0	\$-106	\$-0	\$-499	\$0	\$0	\$-0	\$-0
Total NSS	\$9K	\$10K	\$11K	\$11K	\$11K	\$12K	\$12K	\$12K	\$12K	\$12K	\$13K	\$13K	\$15K	\$15K	\$17K	\$19K

Cohort Composition (FY2024):

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
Other	\$507	\$590	\$593	\$575	\$624	\$600	\$580	\$622	\$636	\$627	\$686	\$671	\$967	\$1,043	\$1,240	\$1,287
Guidance, Counseling and Testing	\$389	\$394	\$409	\$415	\$432	\$451	\$462	\$471	\$483	\$506	\$534	\$564	\$636	\$700	\$768	\$780
Administration	\$440	\$461	\$471	\$488	\$507	\$520	\$544	\$566	\$589	\$580	\$542	\$587	\$628	\$669	\$713	\$754
Instructional Leadership	\$836	\$869	\$873	\$906	\$910	\$951	\$981	\$1,013	\$1,023	\$996	\$1,029	\$1,070	\$1,122	\$1,205	\$1,266	\$1,353
Operations and Maintenance	\$1,066	\$1,030	\$1,058	\$1,035	\$1,055	\$1,105	\$1,158	\$1,160	\$1,161	\$1,185	\$1,301	\$1,302	\$1,482	\$1,566	\$1,783	\$1,845
Other Teaching Services	\$1,025	\$1,073	\$1,133	\$1,141	\$1,232	\$1,284	\$1,342	\$1,413	\$1,449	\$1,508	\$1,553	\$1,582	\$1,714	\$1,895	\$2,100	\$2,190
Pupil Services	\$1,224	\$1,214	\$1,276	\$1,283	\$1,377	\$1,442	\$1,491	\$1,580	\$1,584	\$1,686	\$1,758	\$1,685	\$1,747	\$2,103	\$2,348	\$2,566
Insurance, Retirement and Other	\$2,083	\$2,124	\$2,247	\$2,301	\$2,318	\$2,491	\$2,589	\$2,689	\$2,816	\$2,966	\$3,060	\$3,157	\$3,404	\$3,516	\$3,715	\$3,881
Teachers	\$4,664	\$4,689	\$4,806	\$4,921	\$5,078	\$5,194	\$5,331	\$5,496	\$5,601	\$5,735	\$6,009	\$6,181	\$6,614	\$6,861	\$7,123	\$7,409
Total	\$12,234	\$12,444	\$12,865	\$13,063	\$13,532	\$14,039	\$14,479	\$15,010	\$15,343	\$15,789	\$16,472	\$16,798	\$18,314	\$19,558	\$21,055	\$22,065

FTE Enrollment

Table 17

FTE Series	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024
In-District FTE Pupils	1,555	1,534	1,521	1,493	1,469	1,438	1,418	1,372	1,371	1,361	1,352	1,339	1,255	1,266	1,252	1,245
Foundation Enrollment	1,603	1,580	1,563	1,543	1,524	1,505	1,486	1,469	1,442	1,432	1,416	1,408	1,394	1,333	1,322	1,306
Out-of-District FTE Pupils	120	125	129	130	134	138	146	150	152	155	162	161	158	158	162	162

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
Ch70 Aid	\$5K	\$5K	\$5K	\$5K	\$6K	\$6K	\$6K	\$6K	\$6K	\$6K	\$6K	\$7K	\$7K	\$8K	\$8K	\$9K
Req NSS (minus Ch70)	\$4K	\$4K	\$4K	\$5K	\$5K	\$5K	\$5K	\$5K	\$5K	\$5K	\$5K	\$6K	\$6K	\$6K	\$6K	\$7K
Actual NSS (minus Req NSS)	\$1K	\$1K	\$1K	\$1K	\$1K	\$1K	\$2K	\$2K	\$2K	\$3K	\$3K	\$3K	\$3K	\$3K	\$3K	\$3K
Total NSS	\$10K	\$11K	\$11K	\$11K	\$12K	\$12K	\$13K	\$13K	\$14K	\$14K	\$15K	\$15K	\$15K	\$17K	\$18K	\$19K

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
Other	\$646	\$534	\$900	\$417	\$459	\$424	\$599	\$860	\$635	\$384	\$610	\$559	\$477	\$527	\$457	\$799
Guidance, Counseling and Testing	\$525	\$580	\$617	\$684	\$652	\$733	\$778	\$798	\$803	\$891	\$925	\$945	\$1,001	\$1,241	\$1,406	\$1,465
Administration	\$652	\$664	\$687	\$789	\$987	\$907	\$953	\$926	\$996	\$857	\$759	\$780	\$788	\$859	\$928	\$1,277
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
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
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
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
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
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
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

FTE Enrollment

Table 20

FTE Series	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024
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
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
Out-of-District FTE Pupils	112	129	138	143	138	149	169	190	192	170	158	152	155	145	150	147

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
Ch70 Aid	\$5K	\$5K	\$5K	\$6K	\$6K	\$6K	\$6K	\$6K	\$6K	\$6K	\$7K	\$7K	\$7K	\$7K	\$7K	\$8K
Req NSS (minus Ch70)	\$4K	\$6K	\$6K	\$7K	\$7K	\$7K	\$8K	\$8K	\$8K	\$8K	\$8K	\$9K	\$9K	\$10K	\$10K	\$11K
Actual NSS (minus Req NSS)	\$3K	\$2K	\$3K	\$3K	\$4K	\$4K	\$4K	\$4K	\$5K	\$5K	\$5K	\$5K	\$5K	\$5K	\$5K	\$6K
Total NSS	\$13K	\$14K	\$14K	\$16K	\$17K	\$17K	\$18K	\$18K	\$19K	\$19K	\$20K	\$21K	\$21K	\$22K	\$23K	\$25K

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
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
Guidance, Counseling and Testing	\$396	\$383	\$362	\$411	\$469	\$538	\$545	\$583	\$599	\$631	\$668	\$696	\$830	\$891	\$1,093	\$1,053
Administration	\$627	\$698	\$735	\$709	\$787	\$809	\$919	\$944	\$981	\$799	\$767	\$827	\$874	\$896	\$981	\$1,213
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
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
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
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
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
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
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

FTE Enrollment

Table 23

FTE Series	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024
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
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
Out-of-District FTE Pupils	65	72	73	84	90	90	101	113	110	108	124	122	118	123	129	134

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
Ch70 Aid	\$4K	\$4K	\$4K	\$5K	\$5K	\$5K	\$5K	\$5K	\$5K	\$5K	\$6K	\$5K	\$6K	\$6K	\$6K	\$6K
Req NSS (minus Ch70)	\$4K	\$6K	\$6K	\$7K	\$7K	\$7K	\$7K	\$8K	\$8K	\$8K	\$8K	\$8K	\$9K	\$9K	\$10K	\$11K
Actual NSS (minus Req NSS)	\$6K	\$5K	\$5K	\$6K	\$6K	\$6K	\$7K	\$8K	\$8K	\$9K	\$10K	\$9K	\$9K	\$11K	\$11K	\$11K
Total NSS	\$15K	\$15K	\$16K	\$17K	\$17K	\$18K	\$19K	\$20K	\$20K	\$22K	\$23K	\$23K	\$24K	\$26K	\$26K	\$28K

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
Other	\$575	\$602	\$651	\$766	\$616	\$556	\$563	\$529	\$596	\$453	\$503	\$606	\$1,041	\$840	\$756	\$608
Guidance, Counseling and Testing	\$310	\$306	\$314	\$350	\$354	\$412	\$292	\$304	\$323	\$355	\$351	\$362	\$498	\$790	\$659	\$666
Administration	\$715	\$676	\$710	\$888	\$925	\$1,029	\$809	\$842	\$1,244	\$899	\$826	\$857	\$1,010	\$987	\$1,061	\$953
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
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
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
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
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
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
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

FTE Enrollment

Table 26

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

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
Ch70 Aid	\$2K	\$2K	\$2K	\$2K	\$2K	\$2K	\$3K	\$3K	\$3K	\$2K	\$3K	\$3K	\$3K	\$3K	\$3K	\$4K
Req NSS (minus Ch70)	\$7K	\$7K	\$8K	\$8K	\$8K	\$8K	\$8K	\$8K	\$8K	\$8K	\$8K	\$8K	\$9K	\$9K	\$9K	\$9K
Actual NSS (minus Req NSS)	\$7K	\$7K	\$7K	\$8K	\$9K	\$8K	\$10K	\$10K	\$10K	\$8K	\$11K	\$11K	\$10K	\$13K	\$10K	\$11K
Total NSS	\$16K	\$17K	\$17K	\$17K	\$19K	\$18K	\$21K	\$21K	\$21K	\$18K	\$23K	\$22K	\$21K	\$25K	\$22K	\$24K

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
Other	\$580	\$361	\$384	\$366	\$658	\$639	\$780	\$652	\$569	\$414	\$466	\$407	\$292	\$365	\$422	\$207
Guidance, Counseling and Testing	\$438	\$449	\$459	\$449	\$617	\$664	\$696	\$683	\$682	\$499	\$499	\$582	\$795	\$772	\$775	\$1,855
Administration	\$390	\$398	\$478	\$391	\$664	\$796	\$806	\$980	\$739	\$731	\$489	\$574	\$656	\$688	\$614	\$917
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
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
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
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
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
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
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

FTE Enrollment

Table 29

FTE Series	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024
In-District FTE Pupils	118	125	122	128	132	128	123	123	130	127	134	125	106	119	134	126
Foundation Enrollment	85	81	81	68	63	67	70	73	74	81	83	82	84	70	65	63
Out-of-District FTE Pupils	3	3	4	1	4	7	5	7	11	12	10	4	8	6	5	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
Ch70 Aid	\$3K	\$3K	\$3K	\$3K	\$3K	\$3K	\$3K	\$3K	\$3K	\$3K	\$3K	\$3K	\$3K	\$3K	\$4K	\$4K
Req NSS (minus Ch70)	\$5K	\$6K	\$6K	\$7K	\$8K	\$8K	\$9K	\$9K	\$8K	\$8K	\$8K	\$8K	\$8K	\$9K	\$10K	\$10K
Actual NSS (minus Req NSS)	\$8K	\$8K	\$8K	\$10K	\$12K	\$10K	\$9K	\$10K	\$12K	\$12K	\$11K	\$11K	\$13K	\$16K	\$19K	\$20K
Total NSS	\$16K	\$17K	\$17K	\$20K	\$23K	\$22K	\$21K	\$22K	\$23K	\$23K	\$22K	\$23K	\$24K	\$29K	\$32K	\$34K

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
Other	\$580	\$498	\$564	\$865	\$704	\$515	\$636	\$684	\$1,510	\$420	\$385	\$873	\$1,296	\$551	\$1,102	\$545
Guidance, Counseling and Testing	\$302	\$328	\$345	\$334	\$345	\$344	\$354	\$434	\$318	\$546	\$542	\$383	\$519	\$1,393	\$697	\$826
Administration	\$652	\$943	\$767	\$836	\$877	\$726	\$884	\$1,084	\$1,040	\$846	\$856	\$938	\$925	\$1,100	\$934	\$1,015
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
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
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
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
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
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	\$9,669
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	\$26,908

FTE Enrollment

Table 32

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

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
Ch70 Aid	\$4K	\$4K	\$4K	\$4K	\$4K	\$4K	\$4K	\$4K	\$5K	\$5K	\$5K	\$5K	\$6K	\$6K	\$6K	\$6K
Req NSS (minus Ch70)	\$4K	\$5K	\$5K	\$5K	\$5K	\$5K	\$5K	\$5K	\$5K	\$6K	\$6K	\$6K	\$7K	\$7K	\$7K	\$7K
Actual NSS (minus Req NSS)	\$4K	\$5K	\$6K	\$6K	\$6K	\$7K	\$7K	\$6K	\$9K	\$10K	\$10K	\$12K	\$12K	\$15K	\$13K	\$10K
Total NSS	\$13K	\$14K	\$15K	\$15K	\$15K	\$17K	\$16K	\$15K	\$20K	\$22K	\$21K	\$23K	\$25K	\$29K	\$26K	\$24K

Appendix D. Maps from previous years

Geographic map showing district locations and enrollment cohorts (2019)

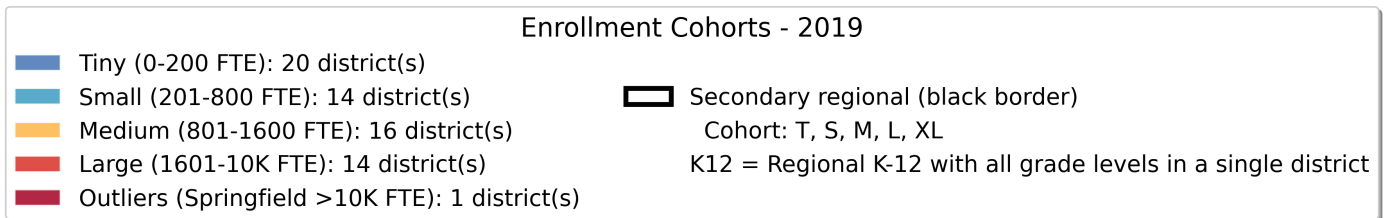
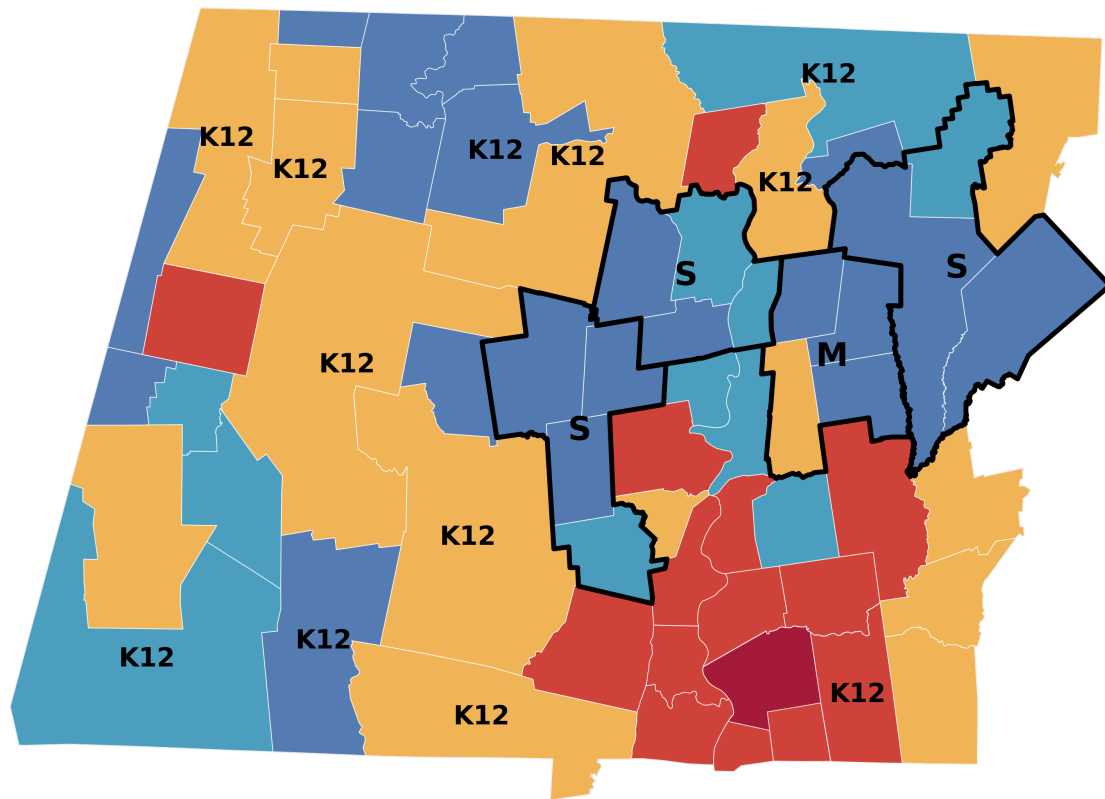


Figure 1

Appendix D. Maps from previous years (continued)

Geographic map showing 2019 PPE vs enrollment cohort baseline

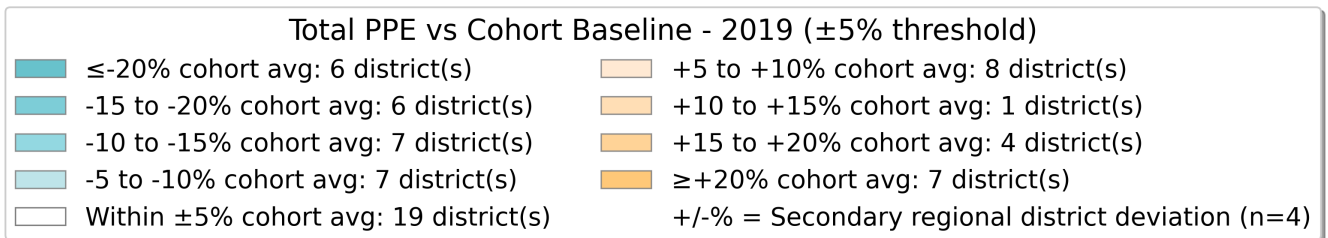
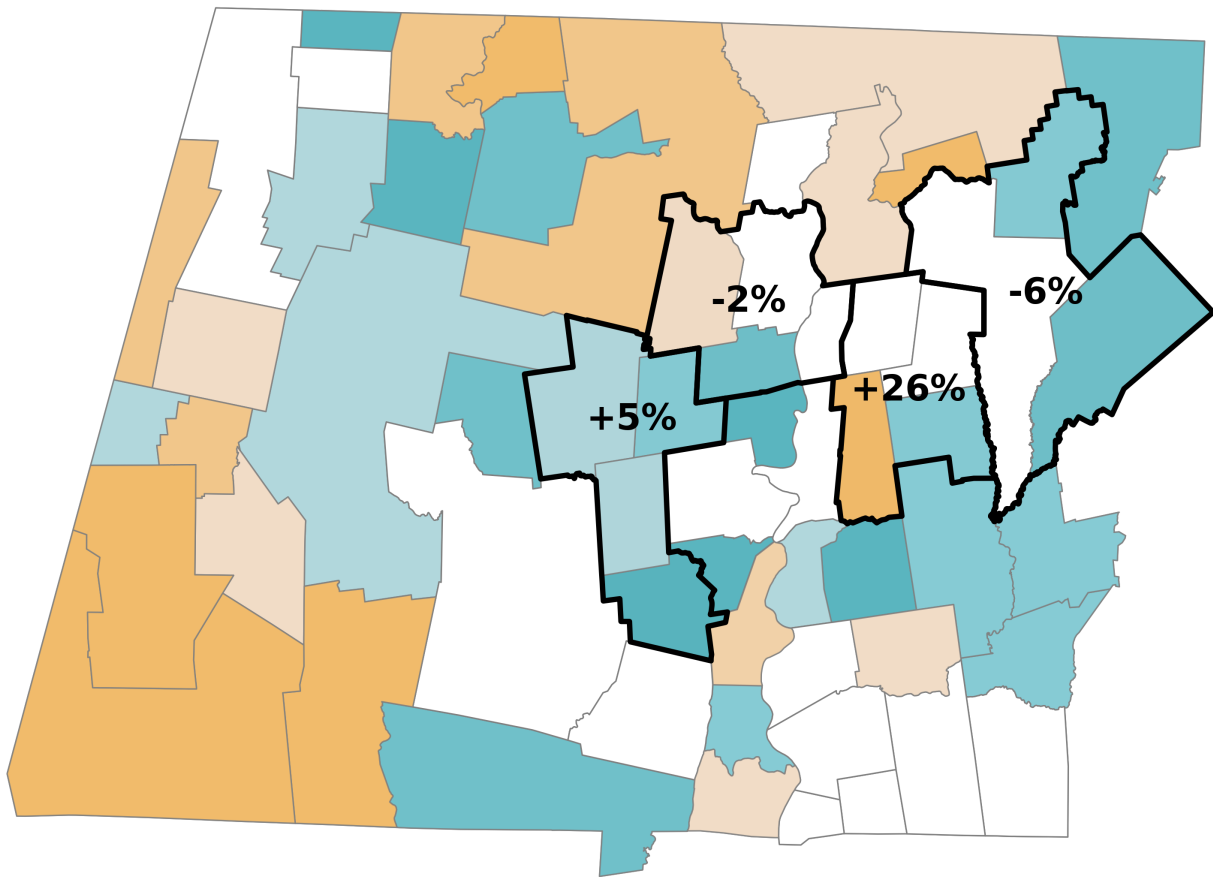


Figure 2

Appendix D. Maps from previous years (continued)

Geographic map showing 10-year PPE growth (2009-2019) vs enrollment cohort baseline

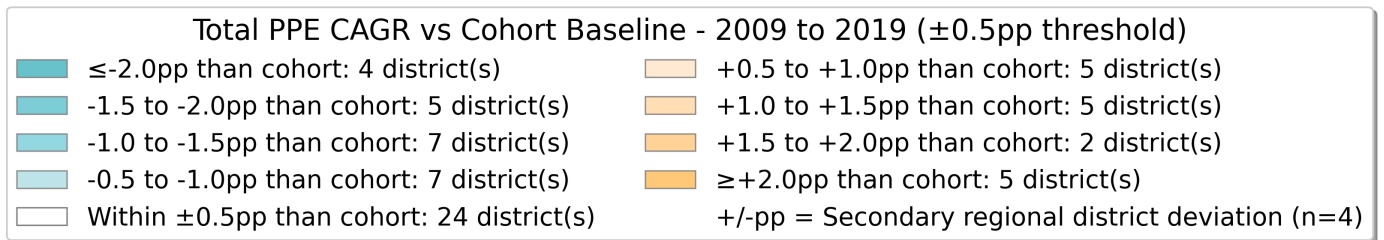
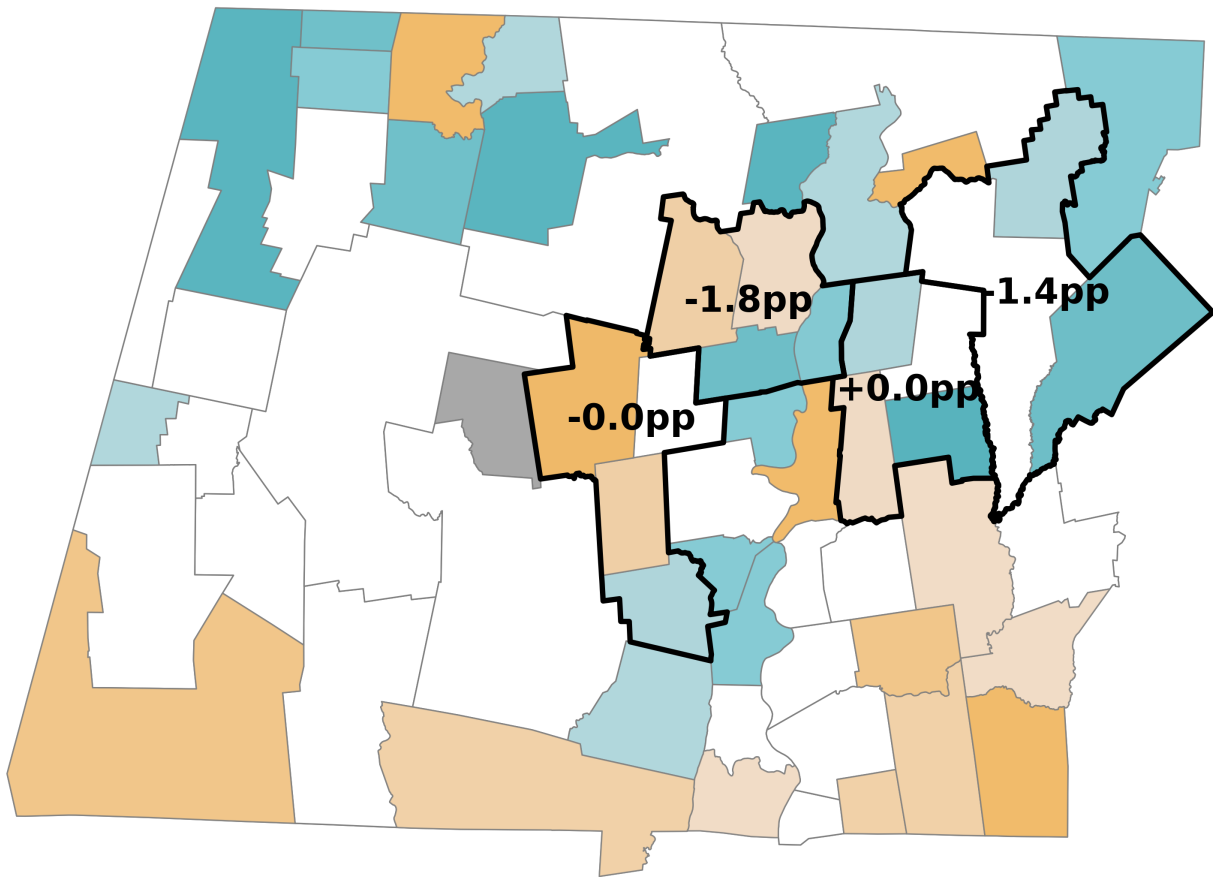


Figure 3

Appendix D. Maps from previous years (continued)

Geographic map showing district locations and enrollment cohorts (2014)

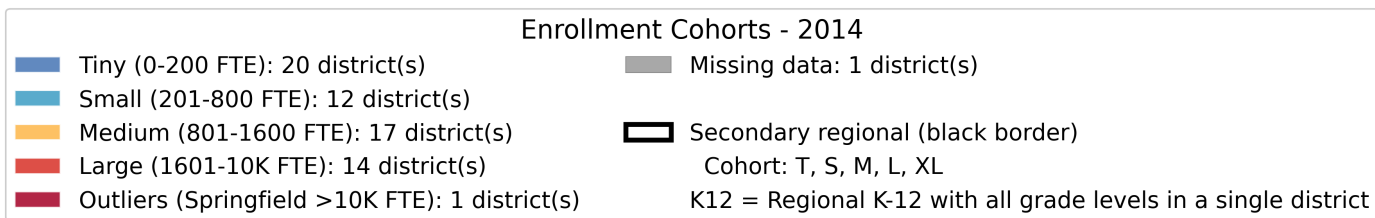
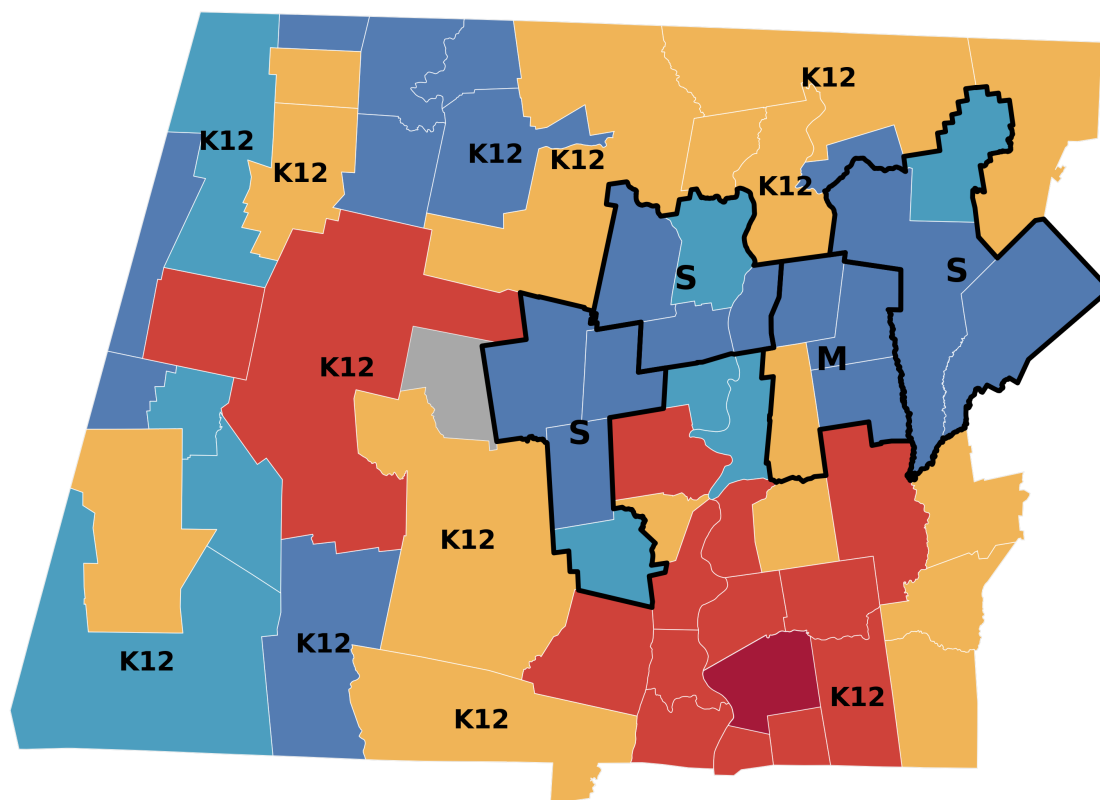


Figure 4

Appendix D. Maps from previous years (continued)

Geographic map showing 2014 PPE vs enrollment cohort baseline

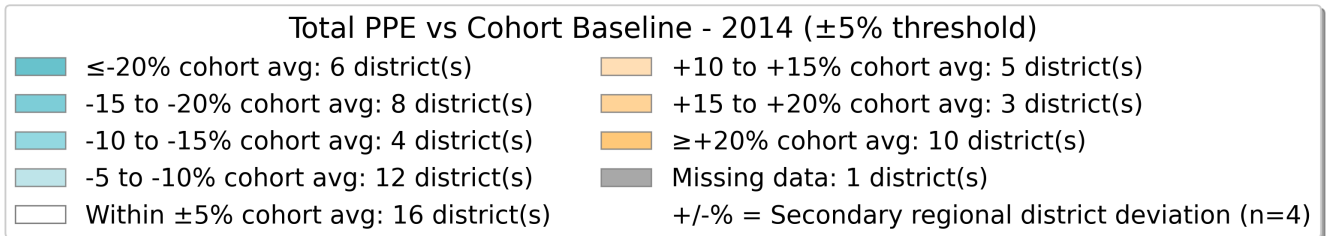
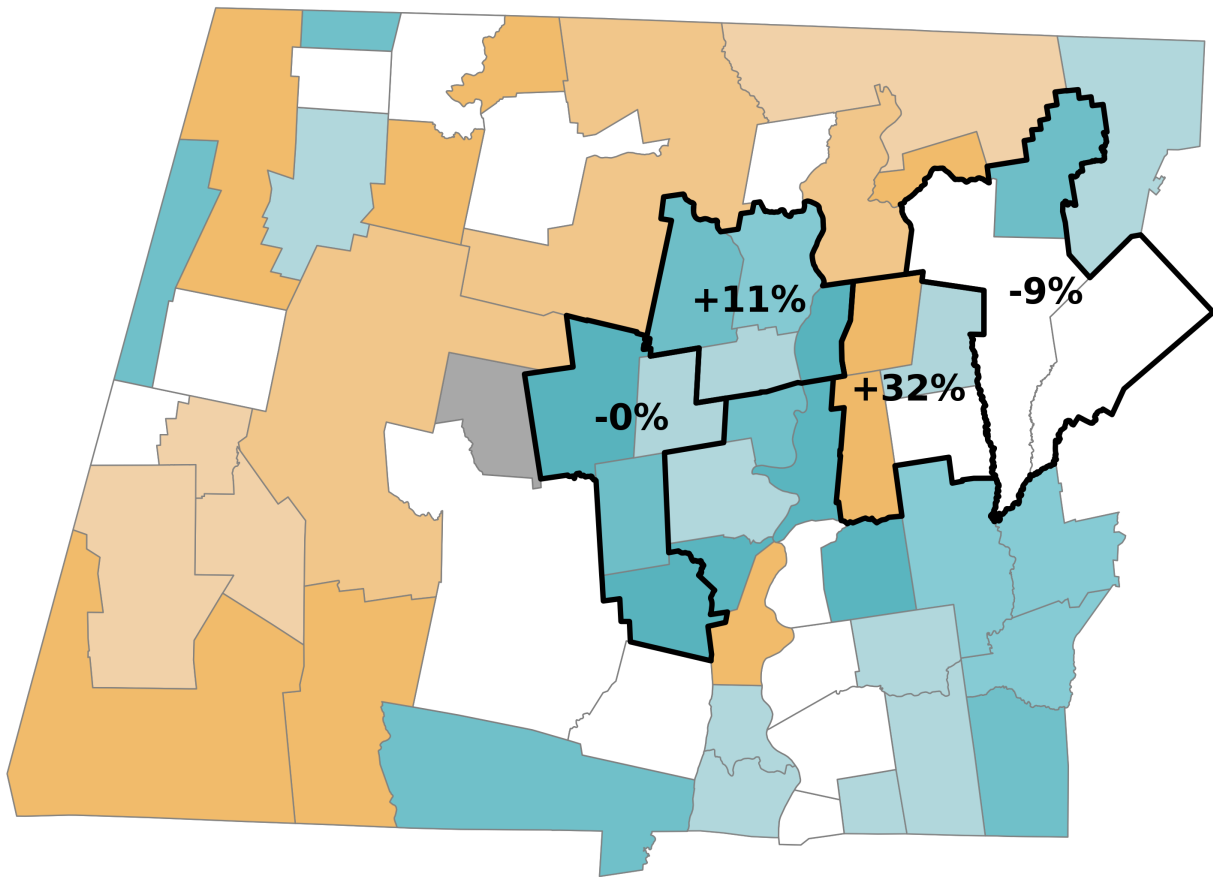


Figure 5

Appendix D. Maps from previous years (continued)

Geographic map showing 5-year PPE growth (2009-2014) vs enrollment cohort baseline

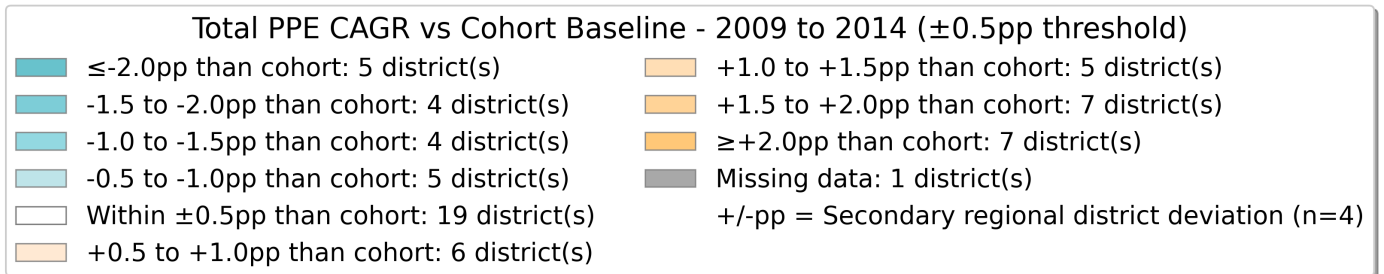
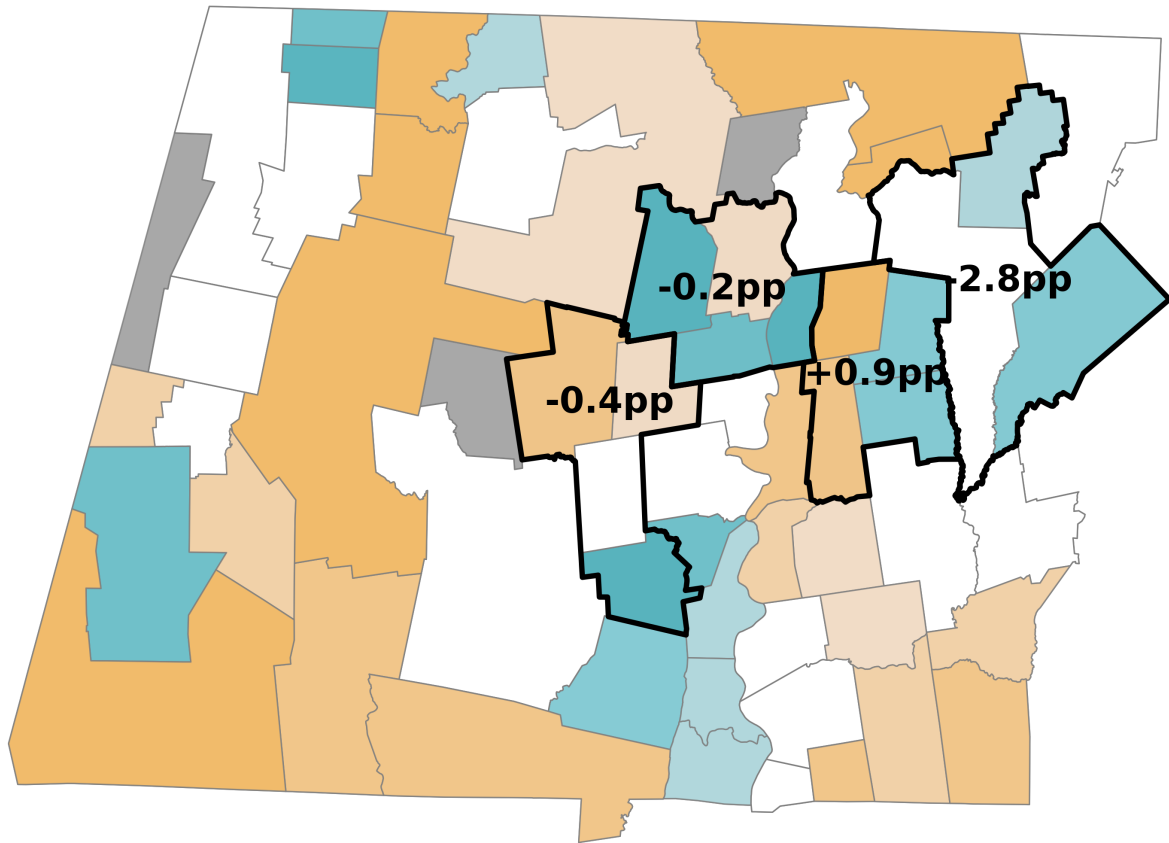


Figure 6

Appendix D. Maps from previous years (continued)

Geographic map showing district locations and enrollment cohorts (2009)

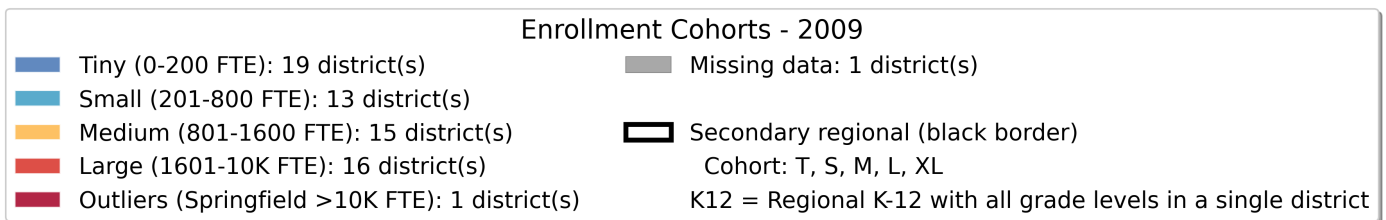
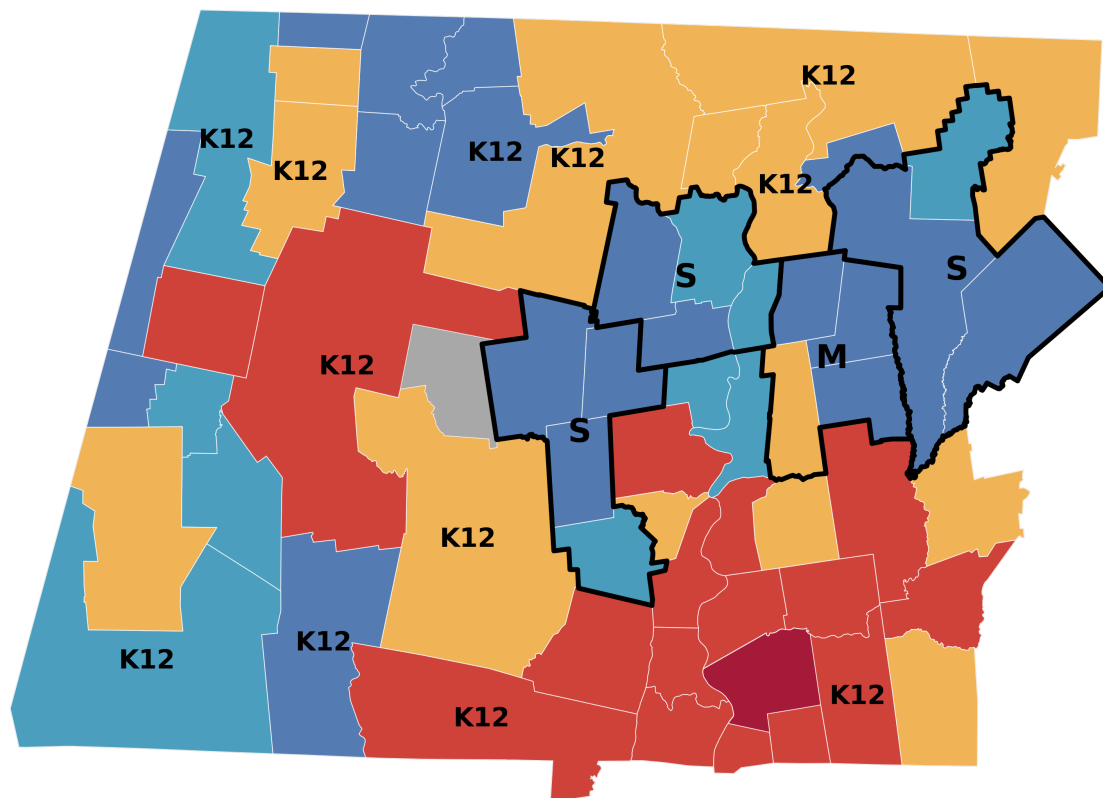


Figure 7

Appendix D. Maps from previous years (continued)

Geographic map showing 2009 PPE vs enrollment cohort baseline

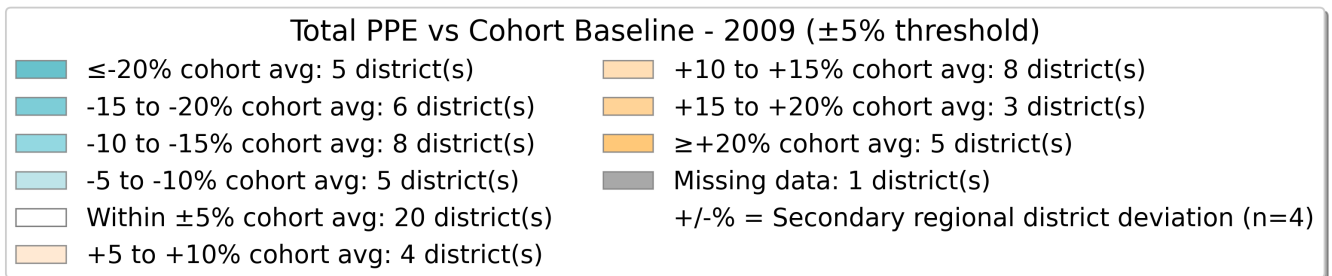
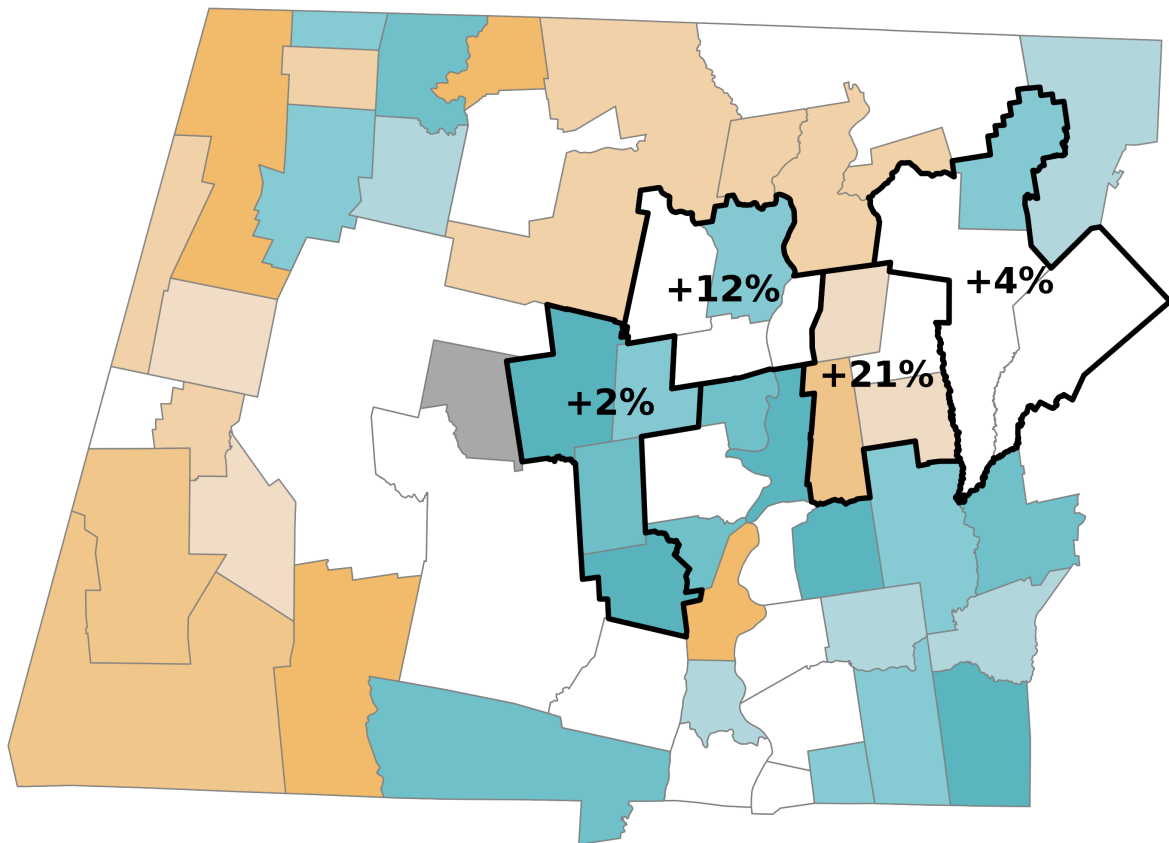


Figure 8