HAVE STATE OPPORTUNITY AREA INCENTIVES CHANGED THE KINDS OF SCHOOLS CHILDREN LIVING IN AFFORDABLE HOUSING HAVE ACCESS TO?

TECHNICAL APPENDIX

Methodology

We assess six school characteristics – rates of student poverty,[1] high school graduation, fourth grade math proficiency, fourth grade literacy proficiency, chronic absenteeism, and post-secondary enrollment – of traditional, non-virtual, public schools in the State, using data provided by the California Department of Education (CDE). Mirroring the methodology used in the TCAC/HCD Opportunity Map, I calculate the median value of enrollment-weighted averages of school characteristics from the three closest schools to the population-weighted centroid of a tract or block group (a proxy for neighborhoods) and to family-serving, LIHTC-financed developments for each characteristic in order to evaluate the attributes of schools in closest proximity to neighborhood centers and affordable housing.

We also include an assessment of racial segregation in schools, given its relevance to the AFFH objective of achieving a more integrated society and research demonstrating the benefits of school integration.[2] To determine if a school is racially segregated, we created a metric that compares a school's raw share of white students to the county's raw average share of white students among all schools.[3] If the school's white population is above the county share, the metric value is positive, and if the school's white population is below the county share, the value is negative. We then use the Jenks optimization method to find natural breaks in the distribution of metric values and divide schools into six categories, with the top two groups comprising "white-segregated" schools" and the bottom two groups comprising "BIPOC-segregated" schools, and the middle two groups comprising a low segregation/integrated group.[4]

The following details apply to all aspects of the analysis shown in the tables below.

- Data sources:
    - The following school characteristics data was collected from the California Department of Education:

[1] In this analysis, we use free or reduced-price meal eligibility as a proxy for student poverty. The Income Eligibility Guidelines provided by the California Department of Education are used by schools and other institutions to determine household eligibility for income-restricted nutrition programs. Students with family incomes below 130% of the federal poverty line are eligible for free lunch and those with family income between 130% and 185% of the poverty line are eligible for reduced-priced meals.
[2] See, for example: Johnson, Rucker C. Children of the Dream: Why School Integration Works (2019). New York, NY: Basic Books and Russell Sage Foundation Press.
[3] Prior research has not settled on a single definition of segregated or integrated schools, and the approach may vary depending on the intended application or context, such as if segregation of specific racial or ethnic groups are of particular interest. Our approach draws from the definition used in Schneider, et al (2021) in which white students are assumed to have a level of social advantage and thus must represent a minimum share of a student population for a school to be considered racially integrated.
[4] The Jenks optimization method clusters data into groups that minimize within-group variance and maximize between-group variance. See also: Jenks, George F. 1967. "The Data Model Concept in Statistical Mapping," International Yearbook of Cartography 7: 186-190.

        - Absenteeism (2021-22 school year)
        - Post-Secondary Enrollment (2020-21 school year)
        - California Assessment of Student Performance and Progress - 4th Grade Math and Literacy Proficiency (2021-22 school year)
        - High School Graduation (2021-22 school year)
        - Free or Reduced-Price Meal Eligibility (2021-22 school year)
        - Public Schools and Districts Information (2021-22 school year)
        - School Demographics (2021-22 school year)
    - California public school location data (2021-22 school year) was collected from the State Geoportal
    - Subsidized housing development data was collected from the California Housing Partnership's Preservation Database (retrieved July 2023). You can learn more about the Partnership's mission and work to preserve affordable housing here.
    - Neighborhood resource designation and region data was collected from the 2024 TCAC/HCD Opportunity Map
- *Opportunity Map*:
    - "Higher Resource" Areas = High Resource and Highest Resource; "Lower Resource" Areas = Moderate Resource, Low Resource
    - Previously the "High Segregated and Poverty" resource category of prior versions of the TCAC/HCD Opportunity Map, the 2024 Opportunity Map changed to include "High-Poverty and Segregated" areas as an overlay and an additional mapping component. As a result, overlapping does occur between "High-Poverty and Segregated" and the resource categories for sections that include evaluation of neighborhood opportunity and resource.
- Schools of interest: Following the methodology of the TCAC/HCD Opportunity Map, we limit our school universe to only include active, traditional public schools in California that have a physical location and are not 100% virtual.
- Question 3 (Incentive period analysis): For the 9% LIHTC program, the pre-incentive period is 2015-2018 and the post-incentive period is 2019-2022. For the 4% LIHTC program, the pre-incentive period is 2017-2020 and a post-incentive period is 2021-2022. The 9% LIHTC analysis includes hybrid 9%/4% developments, and the 4% LIHTC analysis does not include hybrid developments.

Question 1: What are the characteristics of schools near family-targeted, LIHTC-subsidized affordable housing developments?

Table 1a: School Characteristics Near Family-Serving Affordable Housing – State and Regional*

		State	Bay Area	Capital	Central Coast	Central Valley	Inland Empire	Los Angeles	Orange County	Rural Areas	San Diego
All Schools (Grades K-12)	Chronic Absenteeism Rate	34%	34%	30%	29%	42%	39%	37%	24%	33%	31%
	Student Poverty Rate	74%	52%	47%	63%	83%	83%	91%	62%	76%	56%
High Schools Only	Post-Secondary Enrollment Rate	63%	68%	71%	73%	56%	54%	55%	73%	61%	64%
	Graduation Rate	92%	90%	94%	92%	90%	93%	89%	95%	94%	92%
4th Grade Only	Lit Prof Rate	34%	36%	48%	34%	25%	27%	33%	45%	33%	48%
	Math Prof Rate	27%	29%	39%	25%	19%	18%	26%	41%	26%	43%

Source: 2020-2022 California Department of Education data (details listed above). 2024 TCAC/HCD Opportunity Map data. CHP Preservation Database (retrieved July 2023).

* This table shows the median value of the enrollment-weighted average of each school characteristic from the three closest schools to a large-family, new construction LIHTC-financed development of all schools in the State and in each region.

Table 1b: School Characteristics of All Schools - State and Regional Benchmarks*

		State	Bay Area	Capital	Central Coast	Central Valley	Inland Empire	Los Angeles	Orange County	Rural Areas	San Diego
All Schools (Grades K-12)	Chronic Absenteeism Rate	31%	24%	31%	26%	38%	34%	33%	21%	31%	29%
	Student Poverty Rate	64%	38%	50%	57%	76%	76%	79%	49%	64%	54%
High Schools Only	Post-Secondary Enrollment Rate	62%	74%	63%	71%	58%	54%	60%	77%	54%	64%
	Graduation Rate	94%	93%	93%	93%	93%	94%	93%	96%	94%	93%
4th Grade-Serving Schools Only	Lit Prof Rate	40%	50%	45%	39%	31%	34%	40%	54%	37%	48%
	Math Prof Rate	33%	44%	39%	30%	23%	25%	32%	50%	30%	40%

Source: 2020-2022 California Department of Education data (details listed above). 2024 TCAC/HCD Opportunity Map data.

* Note: This table shows the median value for each indicator of all schools at the state level and regionally and is a benchmark for comparison to Table 1a.

What share of schools nearest family-serving affordable housing are segregated?

Table 2: Schools Closest to Family-Serving Affordable Housing by Segregation Category - Statewide and Region*

	Share of Schools Closest to Affordable Housing			Share of Schools in Region**		
Region	BIPOC Segregated	White Segregated	Low-Seg/ Integrated	BIPOC Segregated	White Segregated	Low-Seg/ Integrated
Statewide	63%	6%	31%	49%	14%	37%
Bay Area	57%	5%	38%	48%	13%	39%
Capital	67%	4%	29%	47%	12%	41%
Central Coast	61%	5%	34%	48%	16%	36%
Central Valley	70%	5%	25%	47%	10%	43%
Inland Empire	55%	2%	43%	48%	7%	45%
Los Angeles	79%	7%	14%	63%	13%	24%
Orange County	59%	8%	33%	48%	19%	33%
Rural Areas	60%	3%	37%	34%	18%	47%
San Diego	53%	16%	31%	50%	20%	29%

Source: 2020-2022 California Department of Education data (details listed above). 2024 TCAC/HCD Opportunity Map data. CHP Preservation Database (retrieved July 2023).

* This table shows the share of schools in closest proximity to large-family, new construction LIHTC developments in a given segregation category, broken down by region.

** This set of columns shows the share of schools that are categorized in a given segregation category in each region, as a benchmark of comparison.

Table 3: Median Share of the White Student Population of All Schools by Segregation Category – Statewide and Regional*

	Median White Student Population Share		
Region	BIPOC Segregated	White Segregated	Low-Seg/ Integrated
Statewide	4%	53%	27%
Bay Area	5%	51%	27%
Capital	12%	59%	40%
Central Coast	3%	59%	40%
Central Valley	5%	47%	19%
Inland Empire	4%	43%	18%
Los Angeles	1%	48%	14%
Orange County	4%	54%	28%
Rural Areas	8%	60%	50%
San Diego	7%	57%	36%

Source: 2021-2022 California Department of Education school demographic data. 2024 TCAC/HCD Opportunity Map data.
* This table shows the median share of the white student population by segregation category of all schools in the state and in each region.

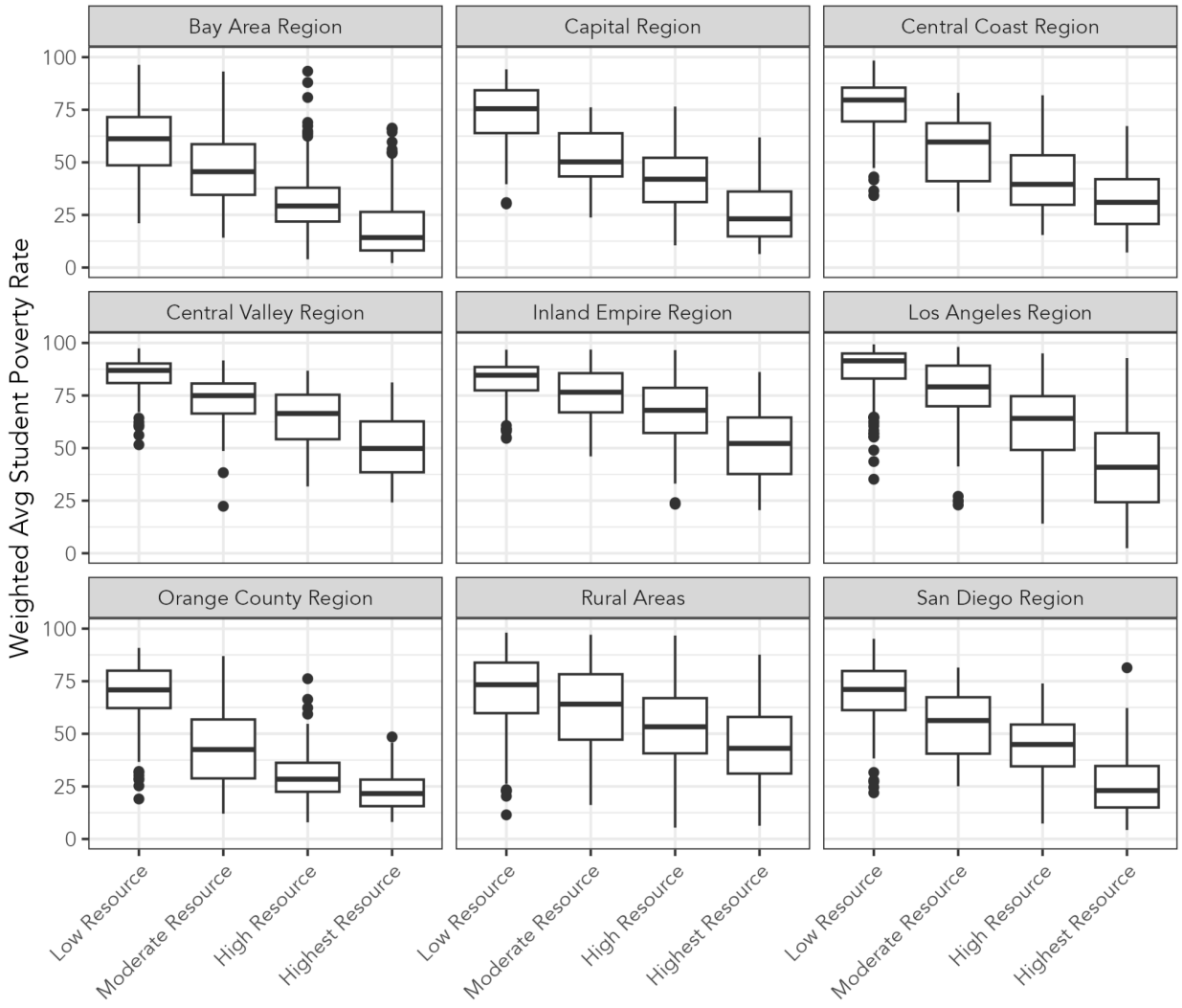
Question 2: Does the TCAC/HCD Opportunity Map capture meaningful differences in school characteristics?

Table 4: School Characteristics by TCAC/HCD Opportunity Map Resource Category – Statewide*

		High-Poverty and Segregated**	Low Resource	Moderate Resource	High Resource	Highest Resource
All Schools (Grades K-12)	Chronic Absenteeism Rate	40%	39%	32%	27%	20%
	Student Poverty Rate	89%	79%	65%	51%	33%
High Schools Only	Post-Secondary Enrollment Rate	56%	58%	62%	67%	74%
	Graduation Rate	90%	91%	93%	94%	95%
4th Grade Only	Math Proficiency Rate	21%	23%	32%	43%	59%
	Literacy Proficiency Rate	28%	30%	39%	49%	64%

Source: 2020-2022 California Department of Education data (details listed above). 2024 TCAC/HCD Opportunity Map data.
* This table shows the median value of the enrollment-weighted average of each school characteristic for the three closest schools to a census tract or block group population-weighted centroid and is broken down by the TCAC Opportunity Map resource categories.
** While prior versions of the TCAC/HCD Opportunity Map included "High Segregated and Poverty" as a resource category, the 2024 Opportunity Map changed to include the "High Poverty and Segregated" areas as an overlay and an additional mapping component. Note that the High Poverty and Segregated categorization is separate from the resource categorizations of the 2024 TCAC/HCD Opportunity Map. As a result, overlapping does occur between "High Poverty and Segregated" and the TCAC/HCD Opportunity Map resource categories, typically in the "Low Resource" category.

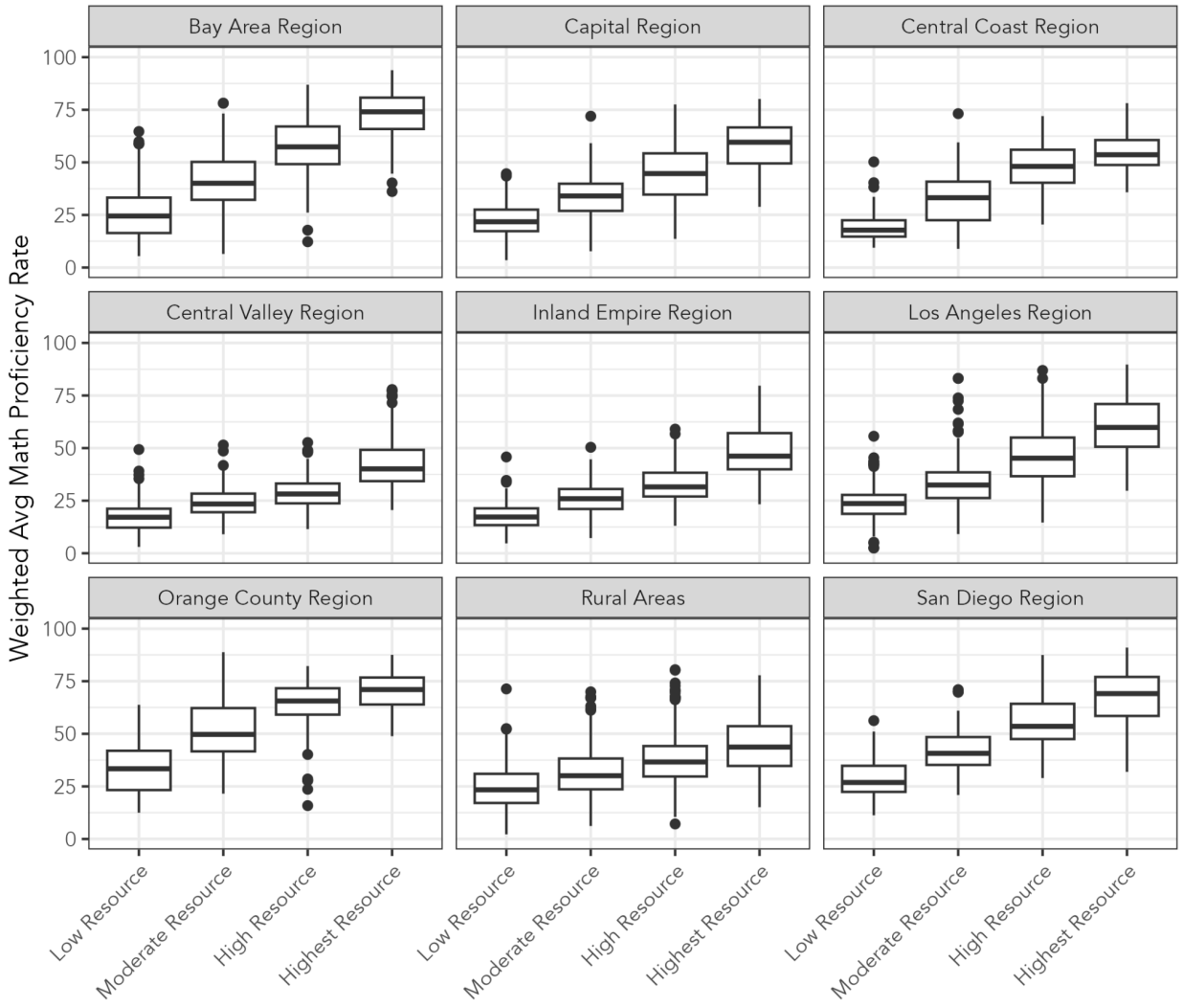
Figure 1: Student Poverty Rates by Resource Designation and Region*



Source: 2021-22 Free or Reduced-Price Meal (Student Poverty) data from the California Department of Education. 2024 TCAC/HCD Opportunity Map data.

* These boxplots show the distribution of the enrollment-weighted average of the free or reduced-price meal (student poverty) rates of all schools by TCAC/HCD Opportunity Map resource categories and grouped by region.

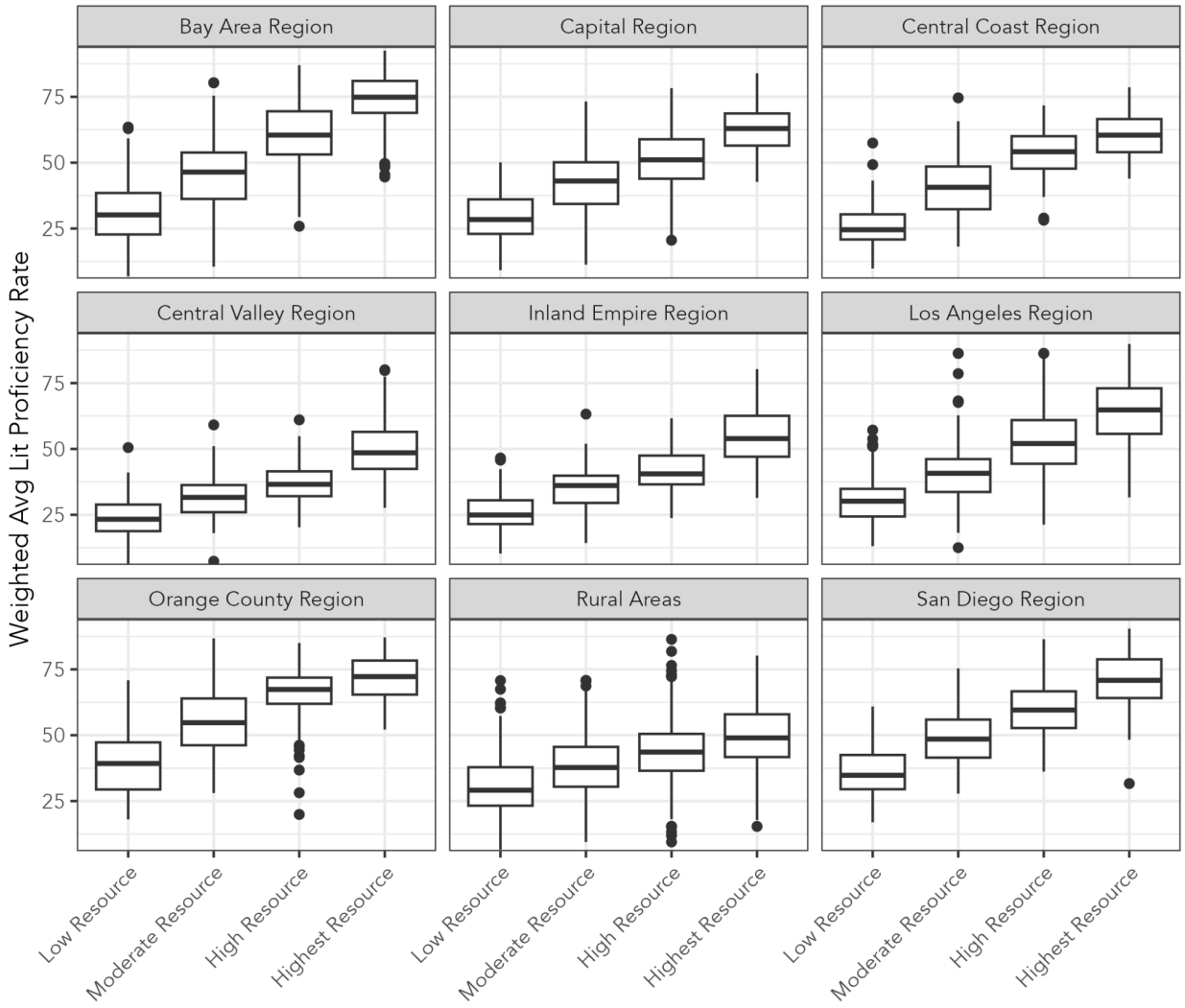
Figure 2: Math Proficiency Rates by Resource and Region*



Source: 2021-22 California Assessment of Student Performance and Progress (CAASPP) data from the California Department of Education. 2024 TCAC/HCD Opportunity Map data.

* These boxplots show the distribution of the enrollment-weighted average of fourth grade math proficiency rates of all schools by TCAC/HCD Opportunity Map resource categories and grouped by region.

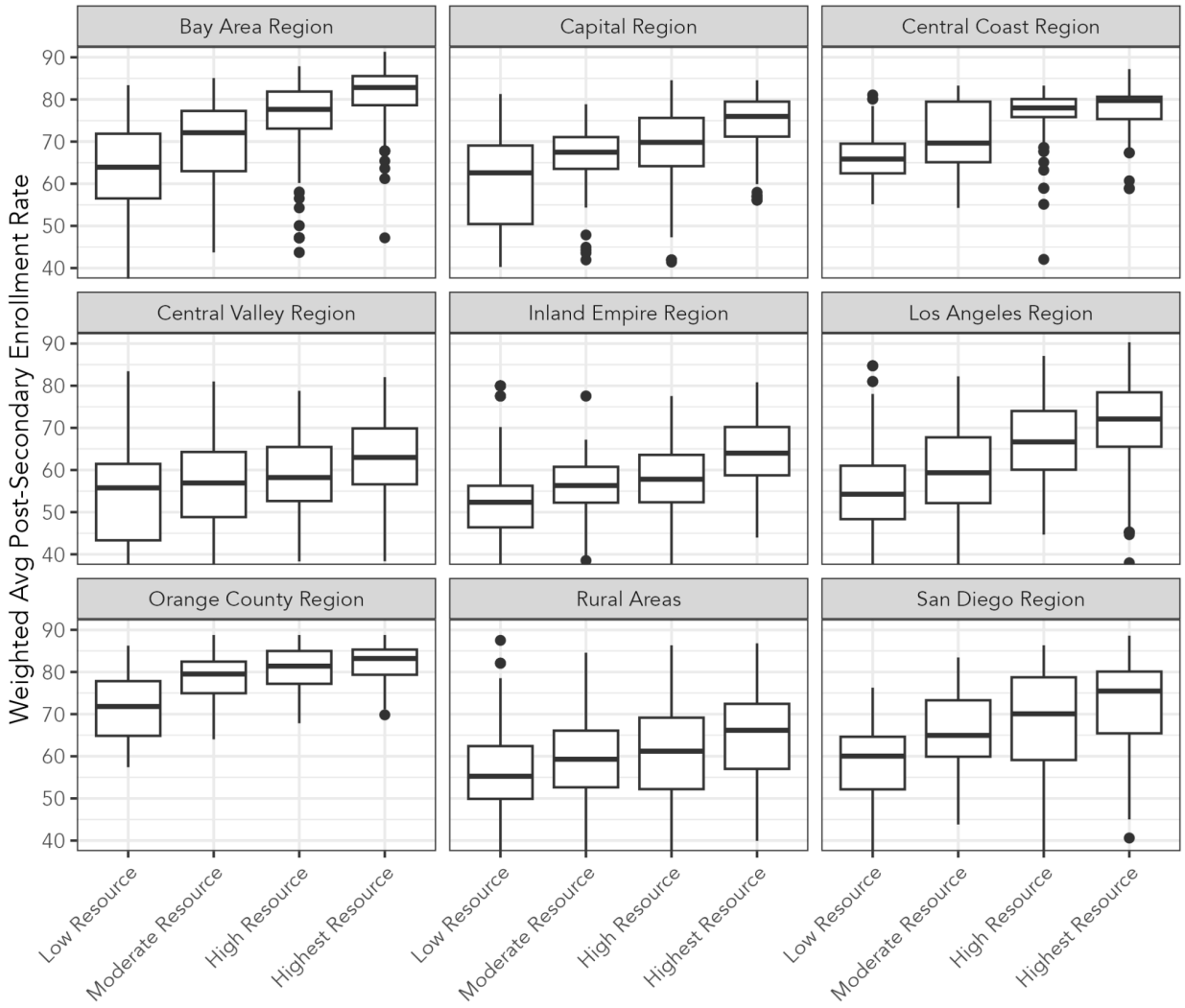
Figure 3: Literacy Proficiency Rates by Resource and Region*



Source: 2021-22 California Assessment of Student Performance and Progress (CAASPP) data from the California Department of Education. 2024 TCAC/HCD Opportunity Map data.

* These boxplots show the distribution of the enrollment-weighted average of fourth grade literacy proficiency rates of all schools by TCAC/HCD Opportunity Map resource categories and grouped by region.

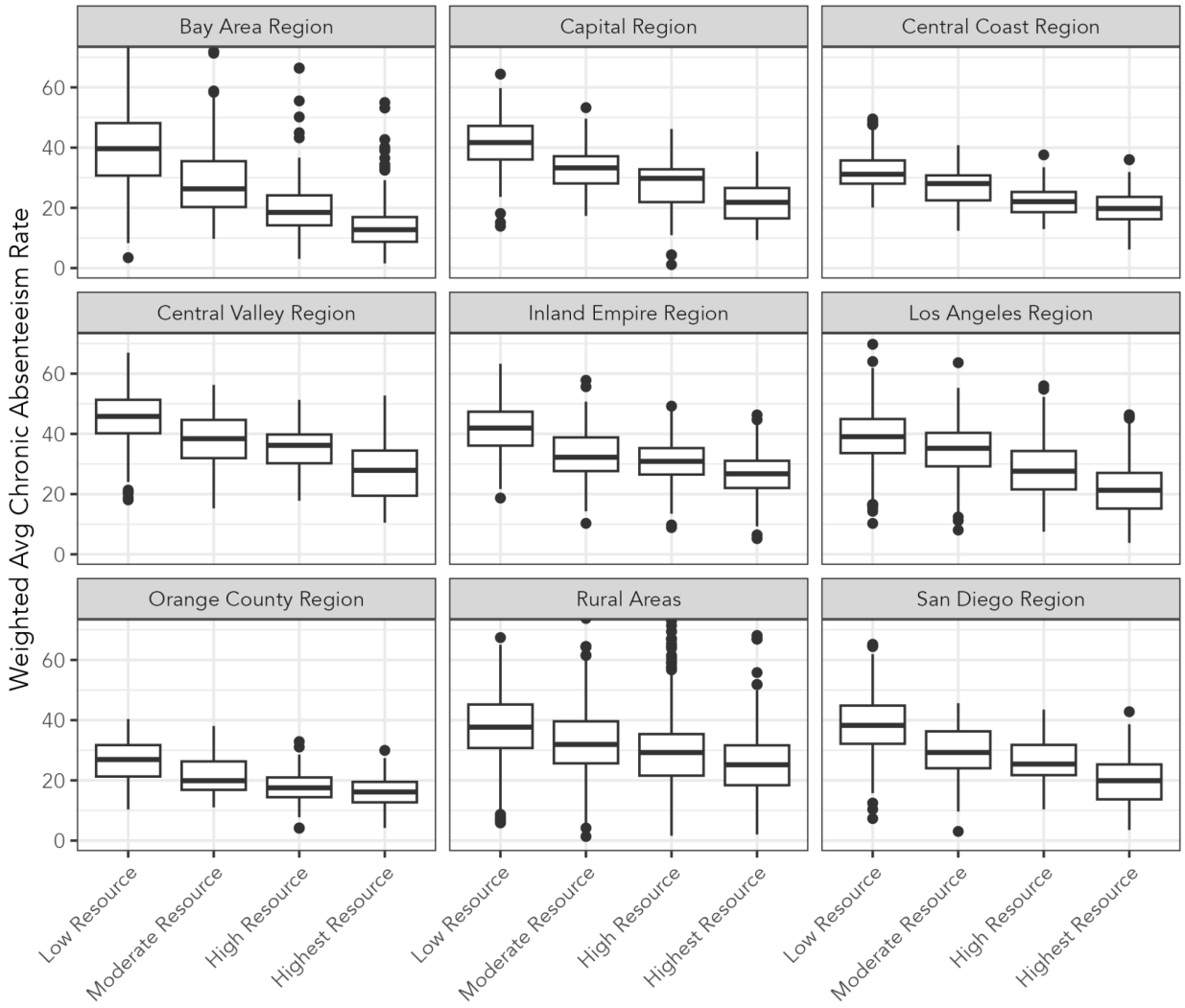
Figure 4: Post Secondary Enrollment Rates by Resource and Region*



Source: 2020-21 Post-secondary enrollment data from the California Department of Education. 2024 TCAC/HCD Opportunity Map data.

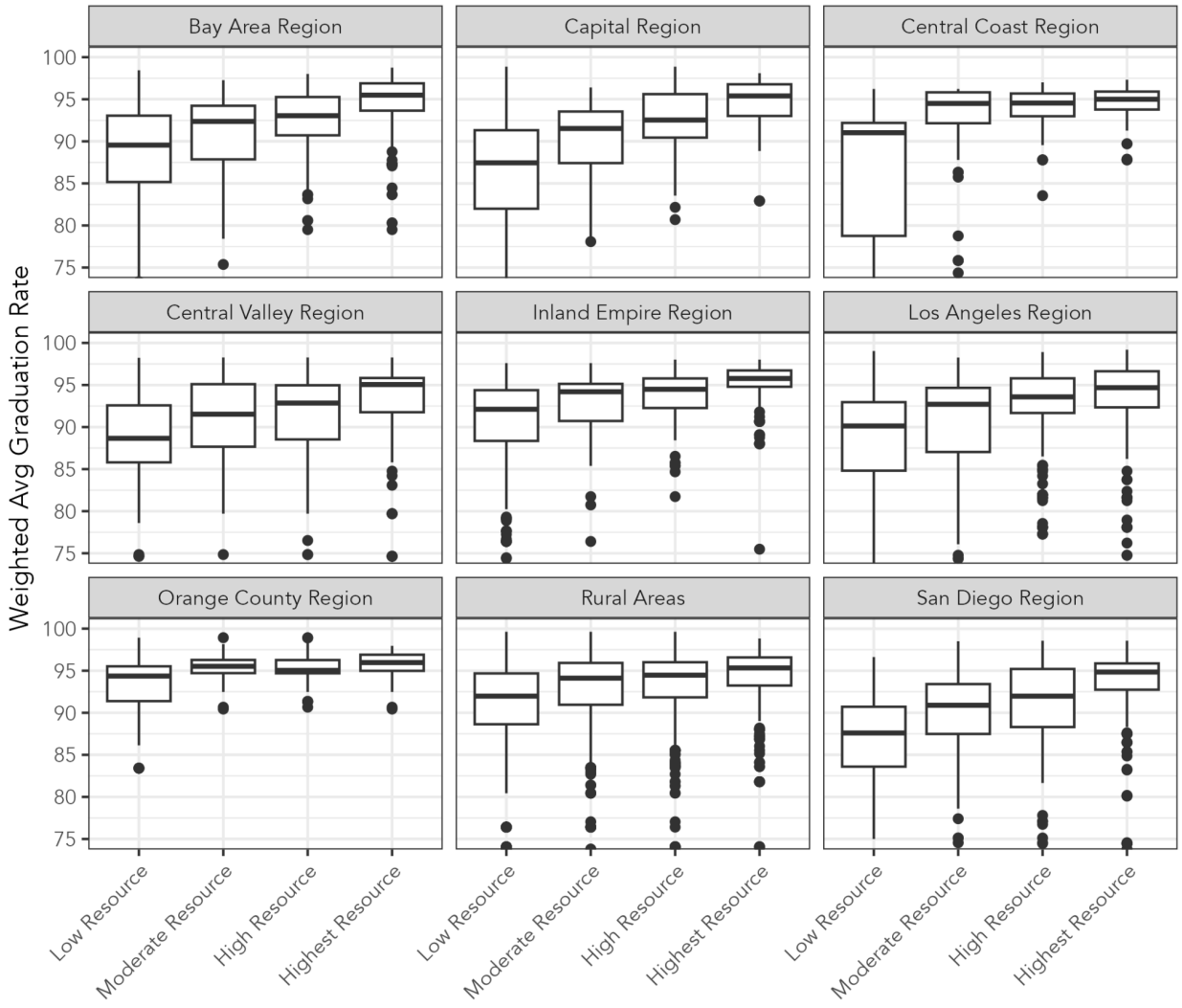
* These boxplots show the distribution of the enrollment-weighted average of post-secondary enrollment rates of all schools by TCAC/HCD Opportunity Map resource categories and grouped by region.

Figure 5: Chronic Absenteeism Rates by Resource and Region*



Source: 2021-22 Chronic absenteeism data from the California Department of Education. 2024 TCAC/HCD Opportunity Map data.
* These boxplots show the distribution of the enrollment-weighted average of chronic absenteeism rates of all schools by TCAC/HCD Opportunity Map resource categories and grouped by region.

Figure 6: High School Graduation Rates by Resource and Region*

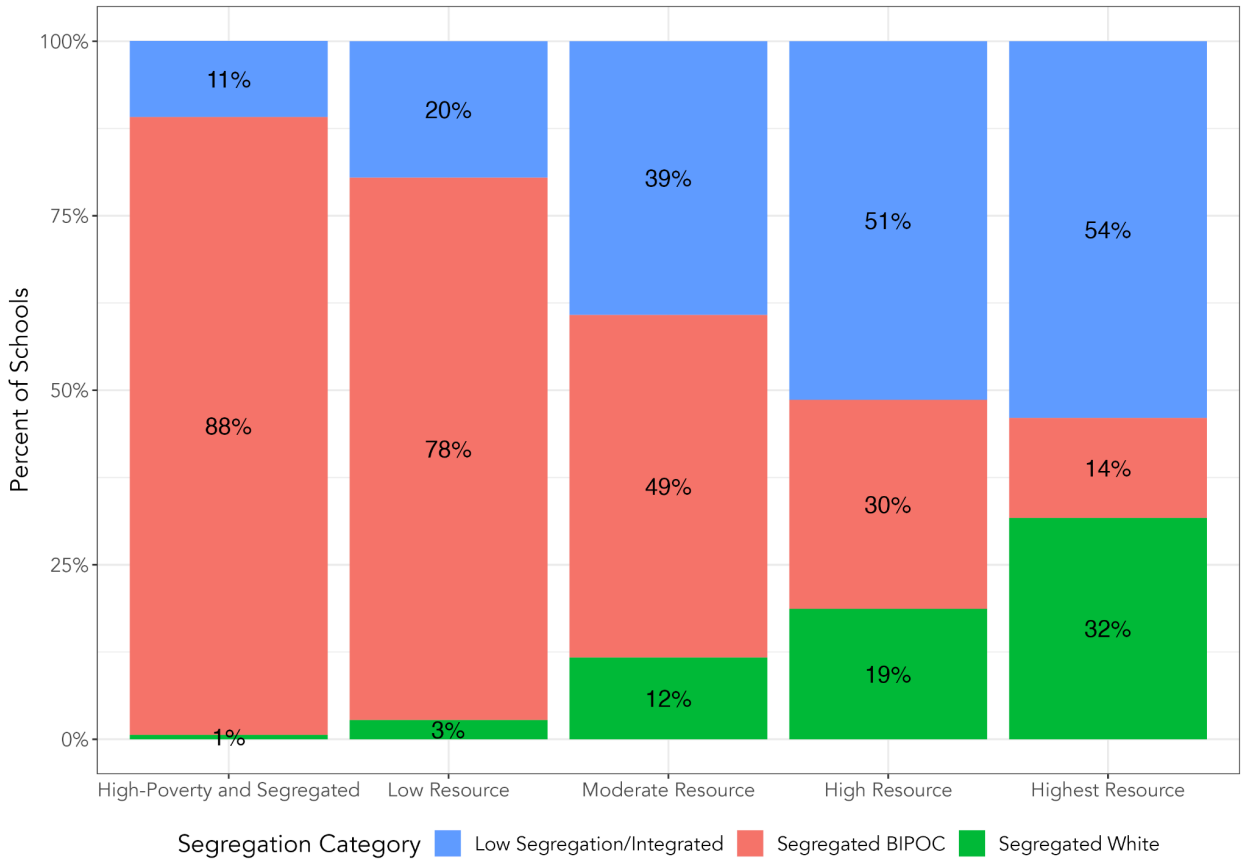


Source: 2021-22 High school graduation data from the California Department of Education. 2024 TCAC/HCD Opportunity Map data.

* These boxplots show the distribution of the enrollment-weighted average of high school graduation rates of all schools by TCAC/HCD Opportunity Map resource categories and grouped by region.

What is the share of schools that are segregated in each of the TCAC/HCD Opportunity Map's mapping categories?

Figure 7: TCAC/HCD Opportunity Map Resource Category by School Segregation Category – Statewide*



Source: 2020-2022 California Department of Education data (details above). 2024 TCAC/HCD Opportunity Map data.
* This chart shows the share of all schools in each TCAC/HCD Opportunity Map resource category (including the High-Poverty and Segregated overlay) by segregation category in the State.

Figure 8: TCAC/HCD Opportunity Map Resource Category by School Segregation Category – Regional*

Source: 2020-2022 California Department of Education data (details above). 2024 TCAC/HCD Opportunity Map data.
* These charts show the share of all schools in each TCAC/HCD Opportunity Map resource category (including the High-Poverty and Segregated overlay) by segregation category within each region.

Question 3: How have the characteristics of schools near family-serving affordable housing changed since the State adopted opportunity area incentives?

Figure 9: 4% Pre vs Post Incentive – Weighted Average Student Poverty Rate – Statewide

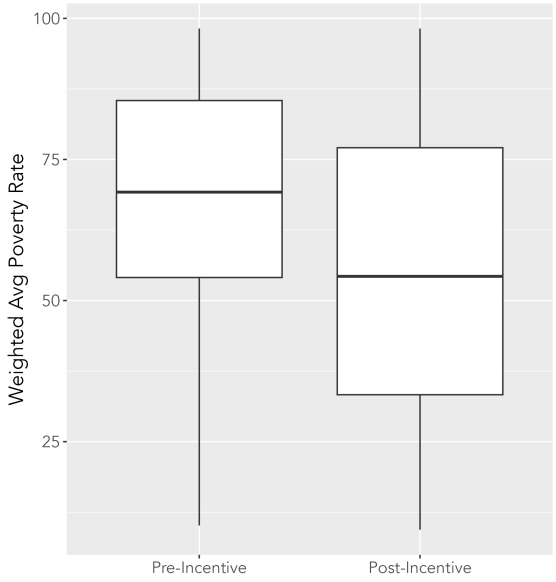
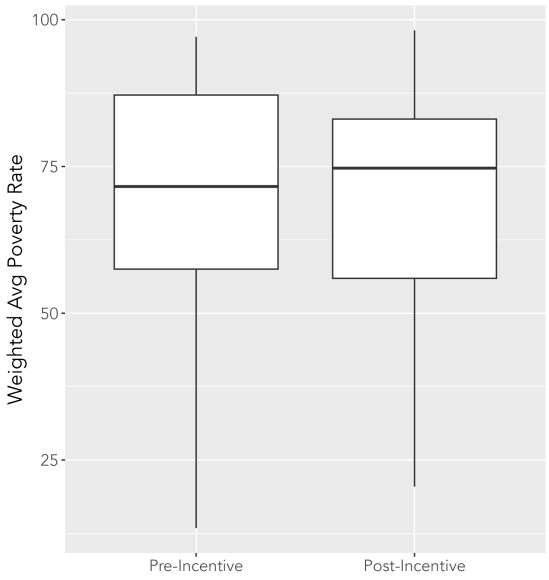


Figure 10: 9% Pre vs Post Incentive – Weighted Average Student Poverty Rate – Statewide



Source: 2021-22 Free or Reduced-Price Meal (Student Poverty) data from the California Department of Education. 2024 TCAC/HCD Opportunity Map data.
*These boxplots show the distribution of the enrollment-weighted average of the student poverty rates of the three schools in closest proximity to each large-family, new construction LIHTC-financed developments in the State for each LIHTC program separated into pre- and post-incentive.

Figure 11: 4% Pre vs Post Incentive – Weighted Average Chronic Absenteeism Rate – Statewide

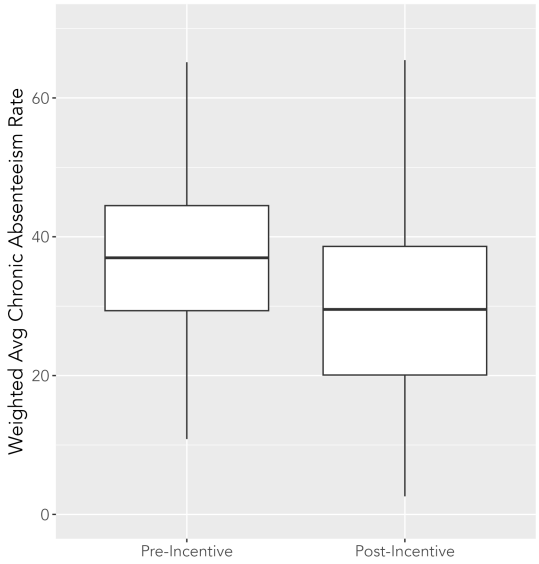
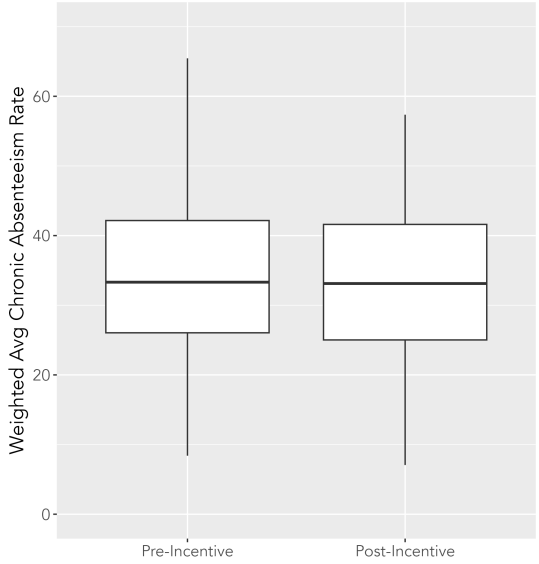
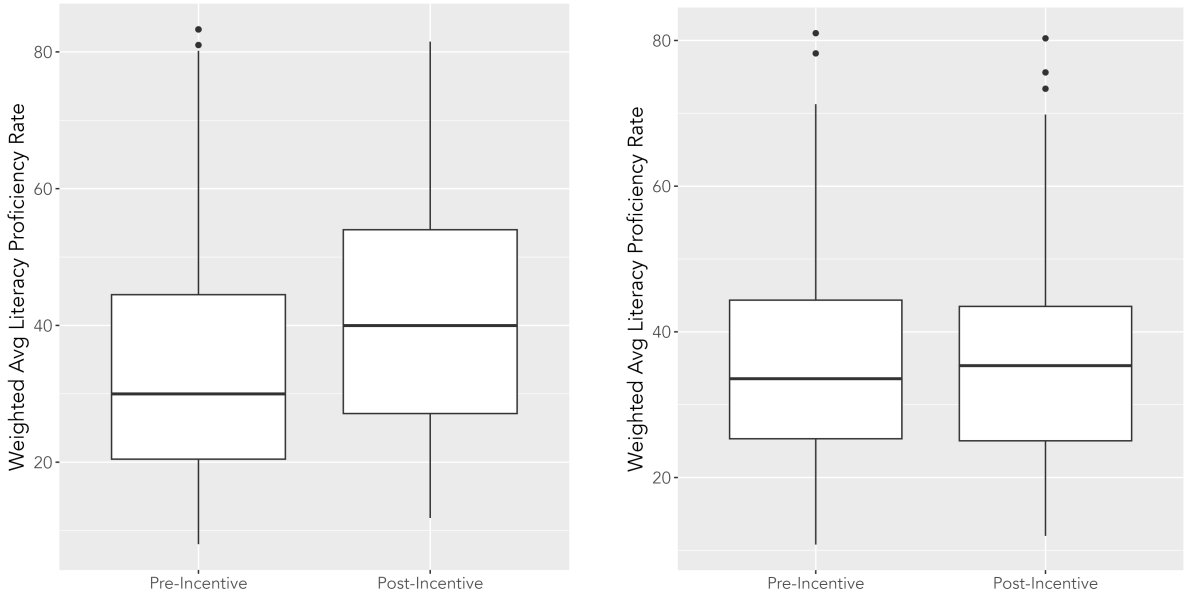


Figure 12: 9% Pre vs Post Incentive – Weighted Average Chronic Absenteeism Rate – Statewide



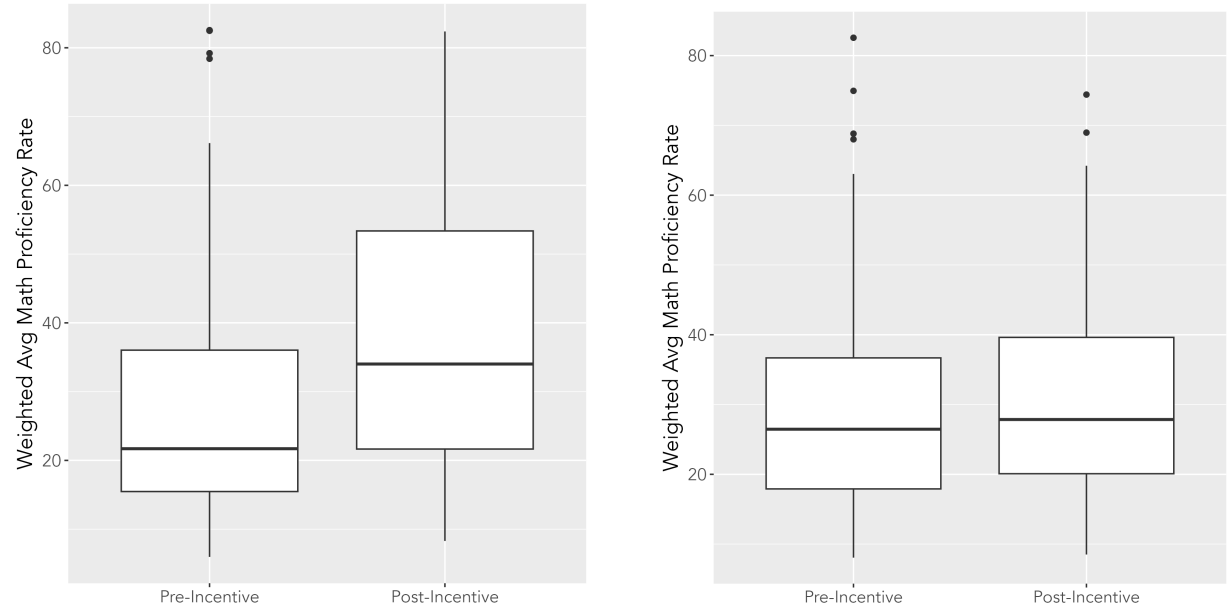
Source: 2021-22 Chronic absenteeism data from the California Department of Education. 2024 TCAC/HCD Opportunity Map data.
*These boxplots show the distribution of the enrollment-weighted average of the chronic absenteeism rates of the three schools in closest proximity to each large-family, new construction LIHTC-financed developments in the State for each LIHTC program separated into pre- and post-incentive.

Figure 13: 4% Pre vs Post Incentive – Weighted Average Literacy Proficiency Rate – Statewide
Figure 14: 9% Pre vs Post Incentive – Weighted Average Literacy Proficiency Rate – Statewide



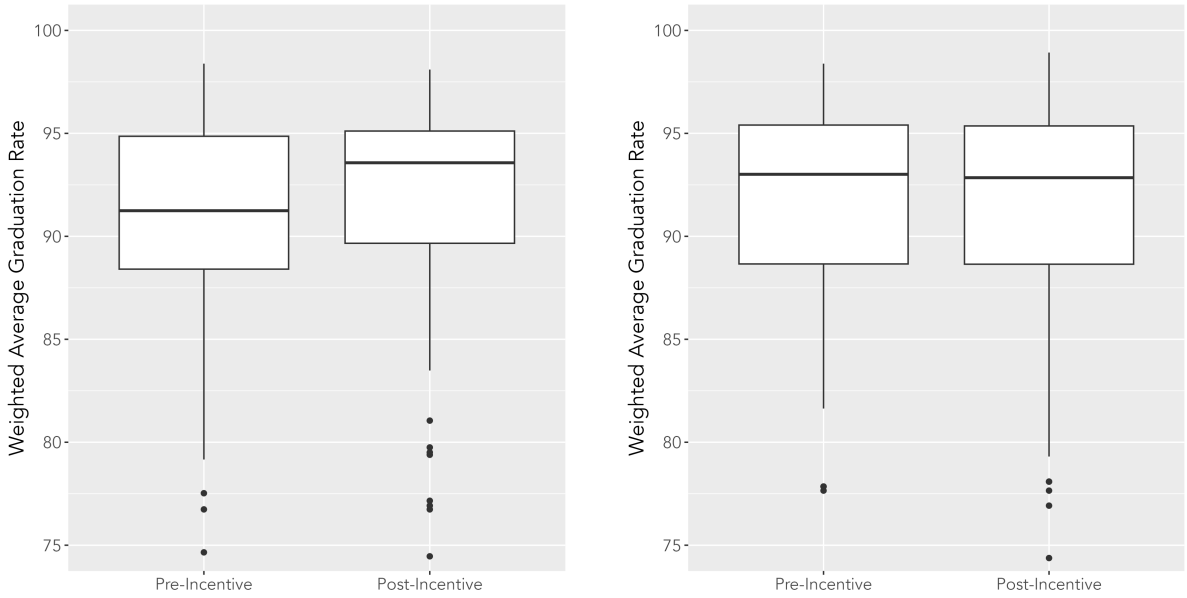
Source: 2021-22 California Assessment of Student Performance and Progress (CAASPP) data from the California Department of Education. 2024 TCAC/HCD Opportunity Map data.
* These boxplots show the distribution of the enrollment-weighted average of the fourth grade literacy proficiency rates of the three schools in closest proximity to each large-family, new construction LIHTC-financed developments in the State for each LIHTC program separated into pre- and post-incentive.

Figure 15: 4% Pre vs Post Incentive – Weighted Average Math Proficiency Rate – Statewide
Figure 16: 9% Pre vs Post Incentive – Weighted Average Math Proficiency Rate – Statewide



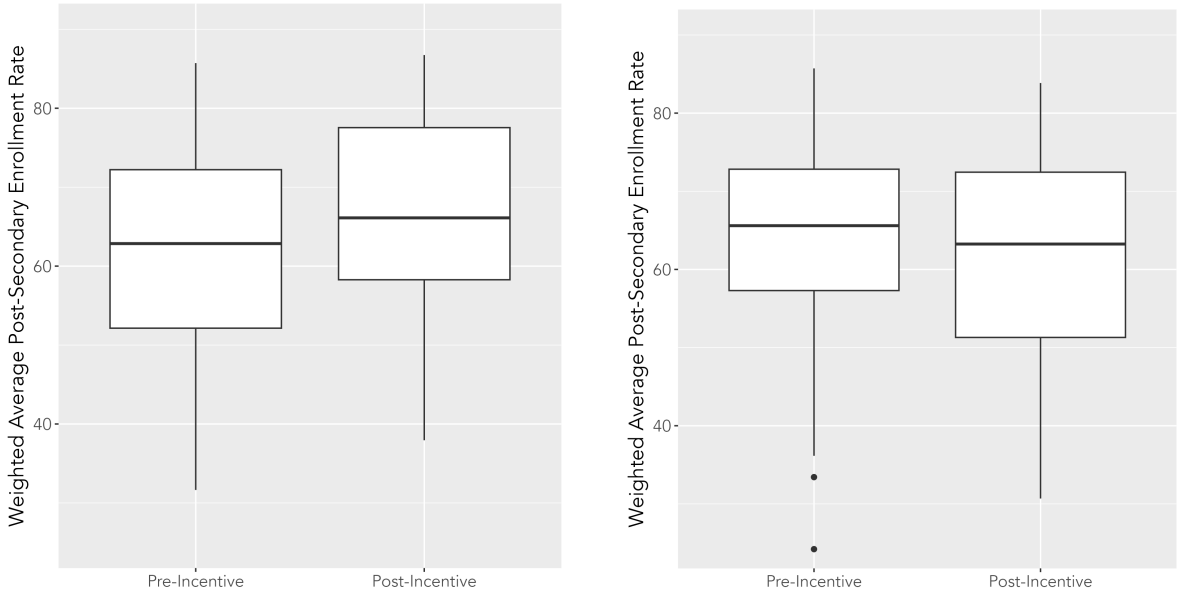
Source: 2021-22 California Assessment of Student Performance and Progress (CAASPP) data from the California Department of Education. 2024 TCAC/HCD Opportunity Map data.
* These boxplots show the distribution of the enrollment-weighted average of the fourth grade math proficiency rates of the three schools in closest proximity to each large-family, new construction LIHTC-financed developments in the State for each LIHTC program separated into pre- and post-incentive.

Figure 17: 4% Pre vs Post Incentive – Weighted Average High School Graduation Rate – Statewide*
Figure 18: 9% Pre vs Post Incentive – Weighted Average High School Graduation Rate – Statewide*



Source: 2021-22 High school graduation data from the California Department of Education. 2024 TCAC/HCD Opportunity Map data.
* These boxplots show the distribution of the enrollment-weighted average of the high school graduation rates of the three schools in closest proximity to each large-family, new construction LIHTC-financed developments in the State for each LIHTC program separated into pre- and post-incentive.

Figure 19: 4% Pre vs Post Incentive – Weighted Average Post-Secondary Enrollment Rate – Statewide*
Figure 20: 9% Pre vs Post Incentive – Weighted Average Post-Secondary Enrollment Rate – Statewide*



Source: 2020-21 Post-secondary enrollment data from the California Department of Education. 2024 TCAC/HCD Opportunity Map data.
* These boxplots show the distribution of the enrollment-weighted average of the post-secondary enrollment rates of the three schools in closest proximity to each large-family, new construction LIHTC-financed developments in the State for each LIHTC program separated into pre- and post-incentive.

Table 5: Median School Characteristics Near Family-Serving Affordable Housing in the Post-Incentive Era by Tax Credit Type and Resource Category - Higher Resource Only – Statewide*

			Resource Designation	
School Type	Education Indicator	Credit Type	High Resource	Highest Resource
All Schools (Grades K-12)	Chronic Absenteeism Rate	4%	31%	17%
		9%	27%	23%
	Student Poverty Rate	4%	52%	25%
		9%	56%	39%
High Schools Only (Grades 9-12)	Post-Secondary Enrollment Rate	4%	63%	80%
		9%	72%	77%
	Graduation Rate	4%	94%	95%
		9%	95%	95%
4th Grade-Serving Schools Only	Math Proficiency Rate	4%	36%	56%
		9%	40%	52%
	Literacy Proficiency Rate	4%	43%	60%
		9%	49%	60%

Source: 2020-22 California Department of Education data (details listed above). 2024 TCAC/HCD Opportunity Map data. CHP Preservation Database (retrieved July 2023).

* This table shows the median value of the enrollment-weighted average of school characteristics from the three closest schools to large-family, new construction LIHTC-financed developments in the post-incentive era by TCAC/HCD Opportunity Map higher resource category and tax credit type, statewide.

What share of schools near family-serving affordable housing are segregated in the pre- and post-incentive eras of the 4% and 9% programs?

Table 6: Share of Schools Closest to Family-Serving Affordable Housing by Tax Credit Type and Incentive Era*

		Share of Schools Near AH		
Tax Credit Type	Pre vs Post Incentive	BIPOC Segregated	White Segregated	Low Segregation/ Integrated
4%	Pre-Incentive	65%	4%	31%
	Post-Incentive	51%	5%	44%
9%	Pre-Incentive	67%	3%	30%
	Post-Incentive	63%	6%	31%

Source: 2020-22 California Department of Education data (details listed above). CHP Preservation Database (retrieved July 2023).
* This table shows the share of schools in closest proximity to large-family, new construction LIHTC-financed developments in a given segregation category, broken down by tax credit type and incentive era.

Table 7: Share of Schools Closest to Affordable Housing in Higher Resource Areas Post-Incentive by Tax Credit Type*

		Share of Schools Near AH		
Tax Credit Type	Resource Category	BIPOC Segregated	White Segregated	Low Segregation/ Integrated
4%	Highest Resource	31%	9%	60%
	High Resource	43%	8%	49%
9%	Highest Resource	14%	19%	67%
	High Resource	44%	12%	44%

Source: 2020-22 California Department of Education data (details listed above). CHP Preservation Database (retrieved July 2023).
* This table shows the share of schools in closest proximity to large family, new construction LIHTC-financed developments in higher resource areas for each given segregation category, limited to developments sited in the post-incentive era.