

School Outcomes and Voter Support for MCAS Graduation Requirement

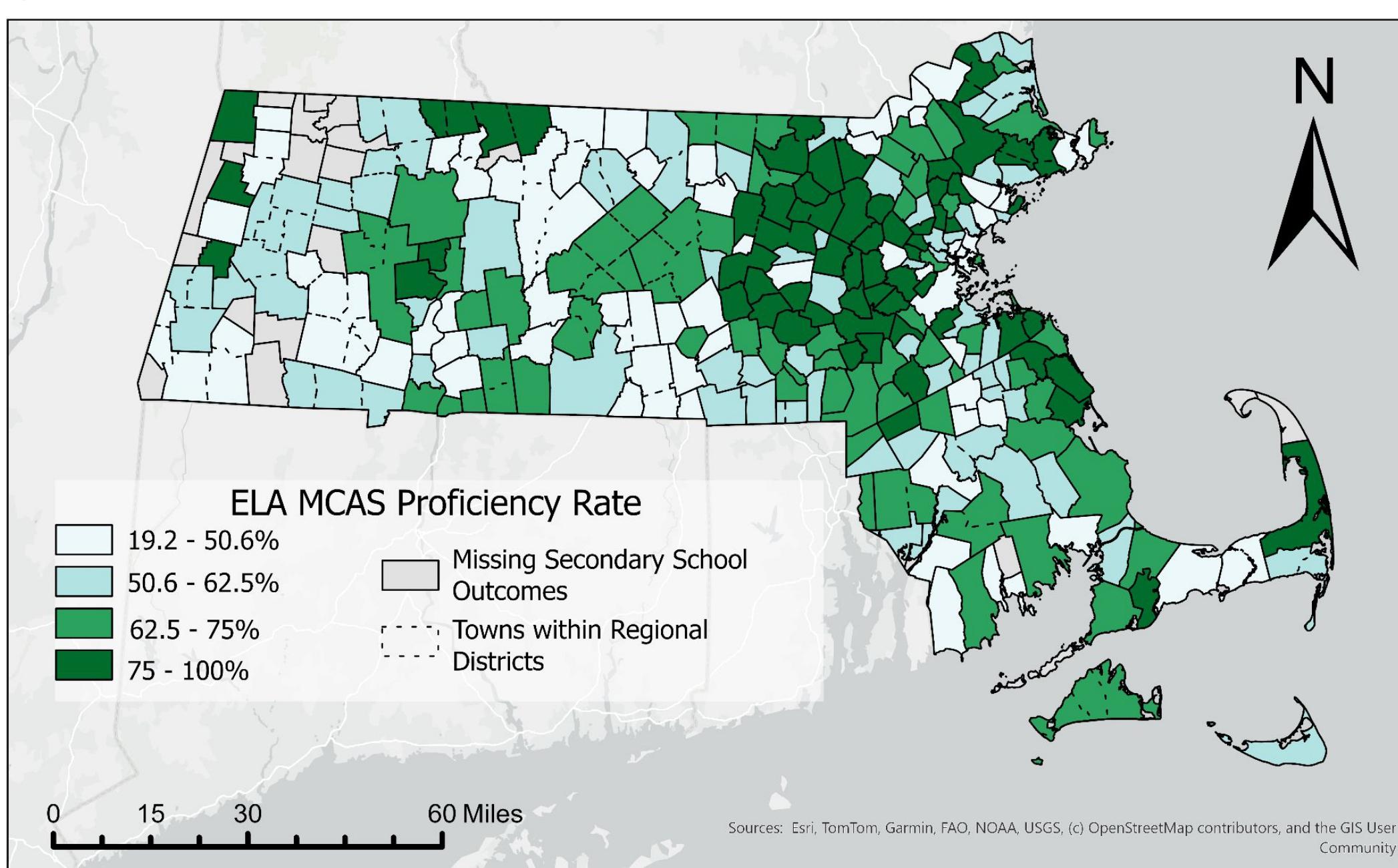
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DACSS 585: Introduction to GIS

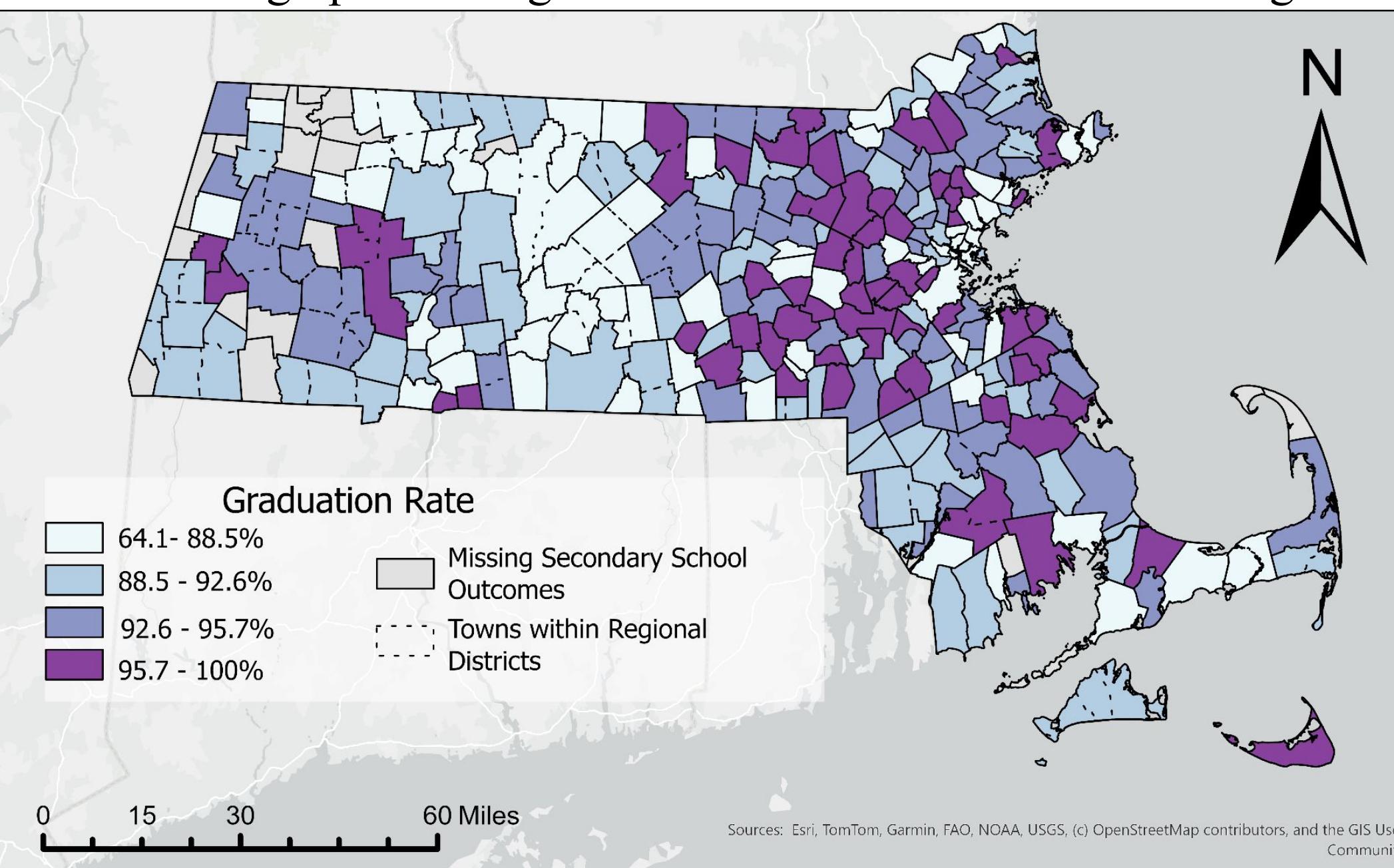
Research Question

In the 2024 election, Massachusetts Question 2 asked voters to decide if the state-wide MCAS high school graduation requirement should be repealed to allow for districts to set their own requirements for students to graduate. The resolution passed with 59% of the vote. How were 2023 town-level school performance metrics associated with vote share supporting Question 2?

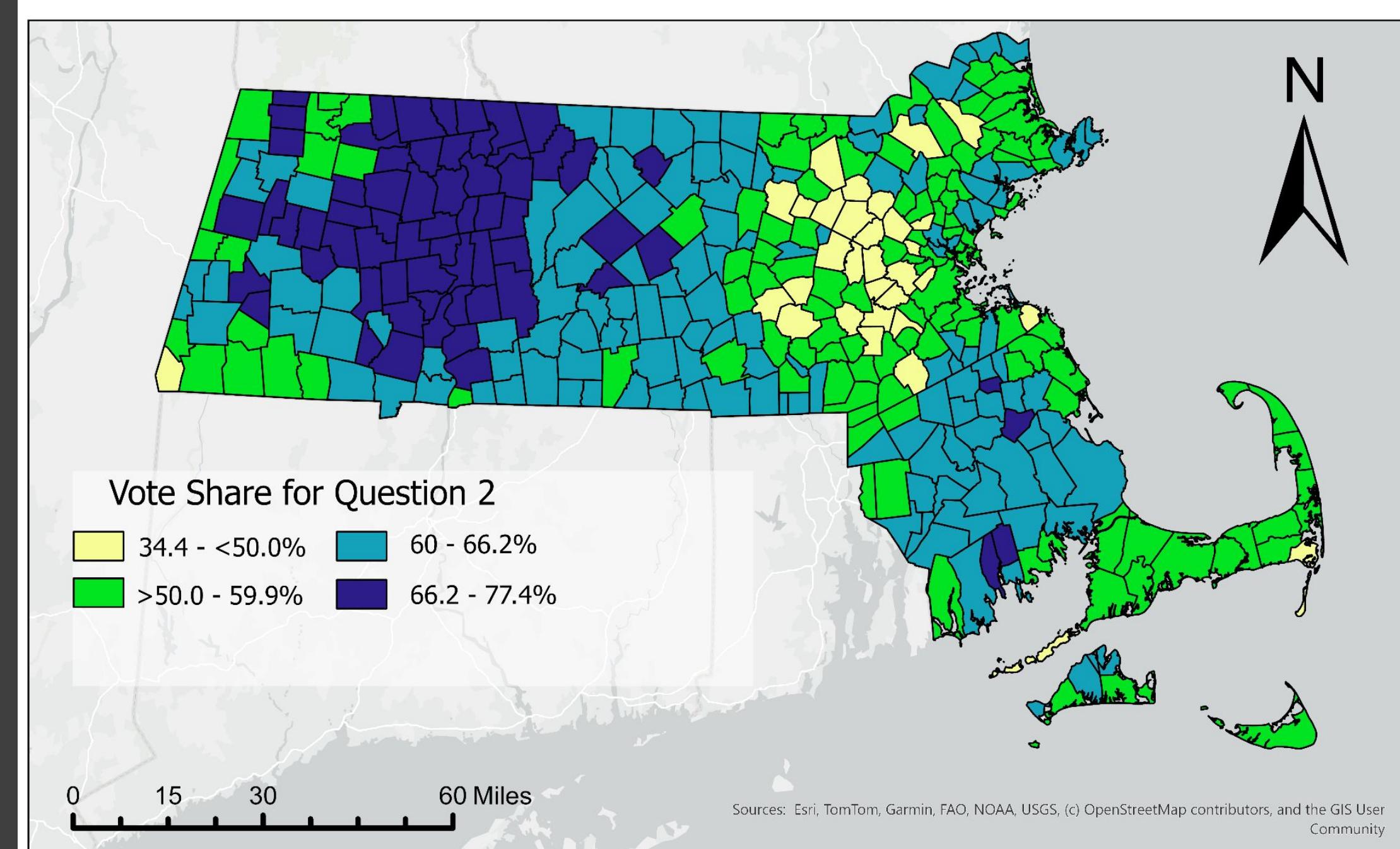
School Outcomes



Town-level % MCAS proficient (above) and % 4-year graduation rate (below), by quintiles. School districts that span multiple towns are indicated. High performing school districts cluster in various regions.



Election Results for MA Question 2 2024



The above figure depicts town-level share of the vote that supported Question 2. Towns that rejected the ballot measure ($N = 31$) are shown in yellow, primarily in the Boston suburbs. Western MA shows strongest support.

Methods

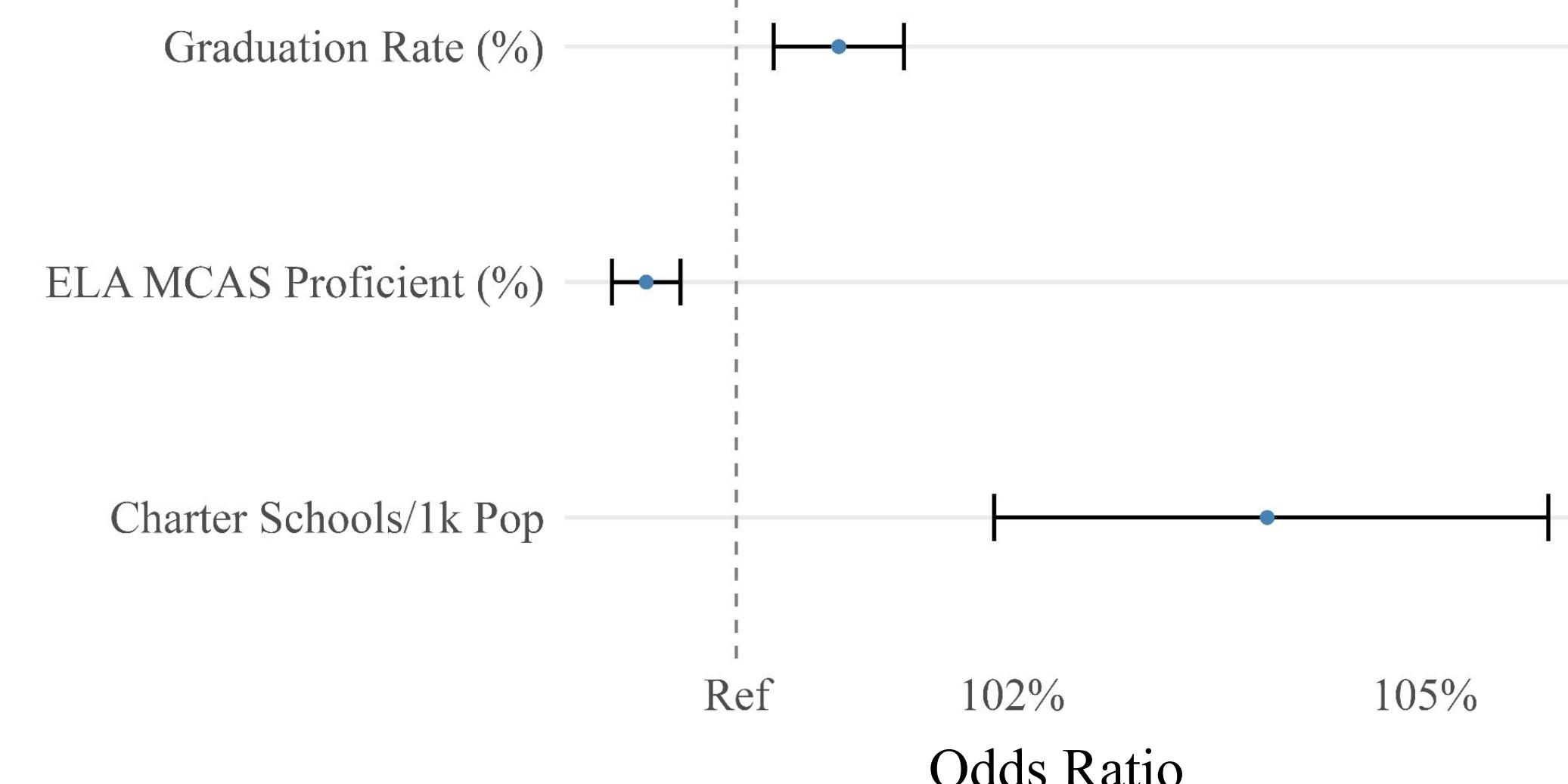
- Collect town and school district geographic data, election results, school district outcomes, and town-level demographic controls.
- Use geographic joins in ArcGIS to combine datasets.
- Visualize school performance metrics and vote share outcomes at the town level, highlighting districts that span multiple towns. Identify any towns served by multiple districts ($N = 1$).
- Conduct regression modeling of final dataset in R. Quasi-binomial general linear model (GLM) chosen for its ability to handle proportional outcomes and heteroskedasticity in town-level data. Total voters included as model weights to account for more precise vote share estimates in larger towns.

Citations

- U.S. Census Bureau. 2025. Census Data API User Guide. U.S. Department of Commerce. Available at: <https://www.census.gov/data/developers/data-sets.html>.
- MassGIS (Bureau of Geographic Information). 2022. MassGIS Data: 2020 U.S. Census Towns. Commonwealth of Massachusetts. Available at: <https://www.mass.gov/info-details/massgis-data-2020-us-census-towns>.
- Secretary of the Commonwealth of Massachusetts, Elections Division. 2024. 2024 Statewide Ballot Question 2 Results. Election Results Archive. Available at: https://electionstats.state.ma.us/ballot_questions/view/11621.
- Massachusetts Department of Elementary and Secondary Education. 2025. School and District Profiles. Available at: <https://profiles.doe.mass.edu/>.
- MassGIS (Bureau of Geographic Information). 2023. MassGIS Data: Public School Districts. Commonwealth of Massachusetts. Available at: <https://www.mass.gov/info-details/massgis-data-public-school-districts>.

School Performance and Question 2 Support (Quasi-Binomial GLM)

N=324 towns | Weights: Total Votes | 95% CIs



The above figure depicts associated odds ratio with each of three key predictors: graduation rate, MCAS proficiency rate, and number of charter schools per 1,000 people in town.

Results and Discussion

- Geographic patterns: Boston suburbs were less likely to support the ballot measure while Western MA had high overall support. High performing districts in Western MA supported Q2 while similar districts in Eastern MA did not.
- Graduation rates and MCAS proficiency have statistically significant but small magnitude effect on odds of Q2 passing when controlling for town demographics (poverty rate, college-education rate, and racial-ethnic composition).
- Areas with more charter schools per 1,000 people saw increased voter support. This result aligns with school choice preferences.
- Limitations: small number of towns who rejected Q2 (9%) led to limited fixed effects. Next steps would be to consider other predictors and explore how graduation rates change after new, district-specific graduation requirements are implemented.