

UC Office of the President

Student Policy Research Papers

Title

From Bed to Bus Stop: Does Living Close to School Make You Smarter or Just Faster?

Permalink

<https://escholarship.org/uc/item/8b12j5x0>

Author

Li, Peter

Publication Date

2025-04-01

Data Availability

The data associated with this publication are available upon request.

From Bed to Bus Stop: Does Living Close to School Make You Smarter or Just Faster?

Peter Li

POL 195: Policy Analysis in California

University of California of Sacramento

Professor Pellaton

Due Date: June 9, 2025

Does the early bird actually get the worm? Each morning, thousands of San Francisco students traverse the city's hills, neighborhoods, and transit systems just to get to school, with some traveling mere blocks and others commuting for a little under an hour. While traditional educational policy discussions often focus on curriculum and funding, the simple matter of how far students live from their schools often goes undiscussed. This study seeks to understand this relationship via broadly exploring how commuting times affect educational performance among SFUSD students. Specifically, this study investigates the question, among the 17 high schools in San Francisco from 2017 to 2023, do schools with lower than average student commute times display better academic performance than those with higher than average commute times?

As one of the few cities that implements school choice policies, understanding the relationship between student commute times and academic performance is critical in San Francisco because racial inequalities and public transportation access interact in deeply interconnected ways that shape students' access to educational opportunities. If longer commute times undermine student academic success, this could have serious implications for how San Francisco Unified School District (SFUSD) allocates students to schools and SFUSD's abilities to support families across neighborhoods with unequal resources. To answer this concern, I compared school-level standardized test scores across all 17 SFUSD high schools in relations to estimated student commute times, using public transit data and performance data provided by the American Community Survey (ACS) and the California Department of Education.

After running a regression with demographic controls, I found that high schools with longer than average student commute times were generally associated with a 1 percentage point increase in the percentage of students meeting or exceeding standards on the Math CAASPP exam. In contrast, for the ELA CAASPP exam, these schools experienced a 3 percentage point

decrease. However, these results are not statistically significant. Therefore, I am unable to draw firm conclusions about the relationship between commuting time and academic performance.

While these findings do not yield definitive evidence about the relationship between commute times and academic performance, they point to potential trade-offs within school choice programs (such as the decision by some families to prioritize academic quality over proximity to school). These dynamics suggest that commute time may reflect more than just traveling to school but may indicate deeper structural inequities in access to high-performing schools. In this way, this study contributes to the broader policy discussions around school assignment reform, transportation equity, and the neighborhood-based disparities that shapes educational opportunity in urban areas like San Francisco.

Historical Context & Significance

San Francisco's distinct topography, dense urban layout, and history of neighborhood-based inequalities have long shaped how residents move through the city, which also influences how students commute to schools. From the construction of Muni in 1912 to the introduction of BART in the 1970s, San Francisco has built an intricate public transportation network that connects its diverse neighborhoods together (BART, 2025; SFMTA, 2025). However, despite this public transportation infrastructure, not all students experience the city's transit system equally. Historical redlining, gentrification, and the uneven development of neighborhoods in San Francisco have left adverse consequences on students who lives in less affluent regions, which has negatively impact these students' abilities to access educational opportunities (Lanuza, 2024; SFUSD, 2020).

Like many school districts in the United States, San Francisco Unified School District (SFUSD) has a long and troubled history of student segregation and unequal access. Beginning

in the 1850s, the district implemented racially segregated schooling policies, predominantly targeting Chinese and Black students for exclusion (SFUSD, 2020). By 1860, this sentiment continued, and California's Department of Education passed legislation explicitly prohibiting Black, Asian, Latino, and American Indian students from attending public schools with white students (SFUSD, 2020).

Although these policies were challenged throughout the 19th and 20th century, most notably in *Tape v. Hurley* (1885), where a Chinese American family sued SFUSD after their daughter was denied admission to a white school due to her race, the California Supreme Court ruled to affirm that all children in California, regardless of race, had the right to a public education under state law. However, instead of being able attend the school that denied her, SFUSD responded to the supreme court's decision by creating a separate "Oriental School", further continuing segregation under a separate name.

Fortunately, the civil rights movement led to greater city-wide reform of public-school student integration. In 1971, *Johnson v. SFUSD* ordered SFUSD to implement race-based school assignments and busing plans that aimed to promote equity in the education system. While these desegregation efforts helped some students gain access to higher-performing schools, they were also met with political resistance and led to white flight (white students leaving the SFUSD educational sphere) and a rise in private school enrollment. These efforts reduced the effectiveness of the district's equity initiatives and led to new demographic divides between schools that were meant to be desegregated (SFUSD, 2020).

Currently, SFUSD remains one of the few districts in California with a citywide school choice system. Rather than assigning students to schools based solely on neighborhood proximity, the district uses a lottery-choice based enrollment process, where students rank their

preferred schools, and placements are determined by an algorithm designed to promote racial and socioeconomic diversity and equity. Unfortunately, while well-intentioned, this process often benefits families with access to resources such as automobiles and higher household income because it allows them to ignore the idea of transportation burden when enrolling into schools. Conversely, students from marginalized communities often must travel long distances by public transit, potentially enduring commutes of 75 minutes or more, just to attend a school with higher academic performance (Robinson, 2015). Often times this commute is burdensome and reduces students' academic motivation to improve academic performance because of factors such as fatigue, less sleep, and less studying time (Voulgaris et al., 2017; Kaushik et al., 2023).

In this context, student commute time becomes more than just a logistical consideration, but rather it reflects structural inequalities in San Francisco housing, education, and public infrastructure. In a city with severe housing affordability issues, many low-income families have been displaced from neighborhoods near high-performing schools. Meanwhile, SFUSD's choice system enables wealthier families to "opt in" to desirable schools with higher quality of education, without facing the same burdens of long commutes, time constraints, or inconsistent transit access as poorer households (Sattin-Bajaj & Roda, 2020). Thus, school commute time in San Francisco can serve as a proxy for both opportunity and exclusion.

Although commute time is often treated as a secondary concern in education policy, its impact is wide and important when thinking about educational equity. Research has shown that longer commutes can result in student fatigue, tardiness, and reduced study or extracurricular time, which can negatively influence academic performance (Jamil et al., 2022). Additionally, commute times can help highlight the prevalent systemic factors in San Francisco like redlining,

transit access, and neighborhood segregation, which continues to affect people’s access to high-quality of public education.

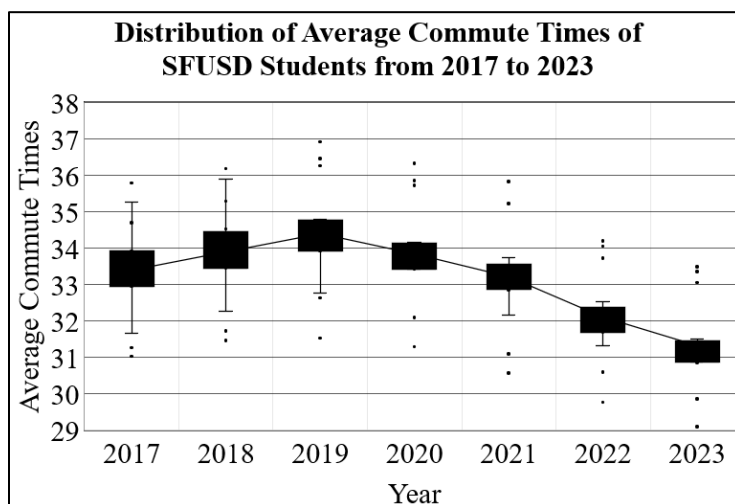


Figure 1: Average Commute Times of SFUSD Students from 2017 to 2023 (ACS, 2017-2023)

Figure 1 illustrates the changes in student commute times in San Francisco vary from 29 minutes to over 36 minutes across SFUSD high schools from 2017 to 2023. These variations highlight San Francisco’s effort to promote more equitable transportation access to all residents, especially towards students in recent years.

Although these recent efforts show growing concerns towards transportation equity in San Francisco, commuting across the city has been historically notably more difficult for residents from less affluent areas (SFUSD, 2020). In these regions, residents often lack reliable access to rapid or frequent public transit options, making school commutes longer and more unpredictable. For students in such neighborhoods, the time and effort required to attend a better-performing school can represent a substantial barrier. Especially, when compounded by other disadvantages like housing insecurity, job precarity, or limited parental flexibility. These transportation inequities, rooted in broader patterns of neighborhood disinvestment and systemic exclusion, determine which students can realistically access top-performing schools. Thus,

understanding whether and how these commuting disparities affect educational performance is essential for designing equitable transportation and school assignment policies.

By investigating how commuting time affects standardized test performance, this study attempts to explore a necessary and often overlooked factor in educational equity. In a city shaped by school choice, racialized housing patterns, and uneven transit systems, student commute time offers a window into how housing and policy barriers continue to shape access to academic opportunity.

Literature Review

This section reviews key findings from the academic literature regarding the relationship between student commute time and academic performance, as well as the role of transportation equity in shaping access to educational opportunity. Together, these bodies of research will help contextualize this study, which attempts to investigate how commute time affects high school performance within San Francisco's lottery choice-based education system.

I. School Choice and Geographic Access

Prior literature on school choice reveals that longer commutes to schools farther than students' immediate residence may reflect parental agency and educational aspiration for student households. Valant and Lincove (2023), a study on New Orleans' open enrollment system, found that many low-income families used school choice mechanisms to send their children to higher-performing schools outside their neighborhoods only when transportation was easily available to their disposal. However, the ability to make school choices that improves access to academic quality for students are not evenly distributed.

The ability to exercise school choice is often constrained by systemic transportation barriers that limit access for certain student populations. Weinstein et al. (2022) analyzed

national data and found that Black and Latino students were less likely to attend schools of better academic quality, even with reliable bus transportation, because they are geographically isolated from these accessible transportation routes. For marginalized groups to take these routes to school, they often endure larger amounts of stress and fatigue compared to their shorter commute counterparts (Voulgaris et al., 2017; Kaushik et al., 2023). These studies suggest that commute time can be a capable indicator for both transportation equity exclusion (due to limited transit access) and ambition (if students are willing and able to travel farther for educational opportunity). My study contributes to this section of the literature by examining whether the trade-offs between commute time and academic quality translates into measurable differences in academic performance across the 17 public high schools within San Francisco's lottery-based school choice system.

II. Transportation Equity and Structural Barriers

Unlike traditional education research, which tends to focus on factors such as school funding and racial composition when examining academic performance, the idea of transportation access is often overlooked. However, the process of students getting to school can have significant effects on students. Specifically, students that have longer commutes to school often face lower academic achievement and increased drop out rates than students of shorter commutes (Lutz et al., 2024; Sharma & Levinson, 2019). Therefore, to benefit student academic performance, it's important to understand how certain transportation policies affect students' accessibility to public transportation.

As Weinstein et al. (2022) argues, school district transportation policies often exclude students living in dense, lower-income neighborhoods from receiving access to bus service, forcing them to rely on slower or more unpredictable public transit. Similarly, Valant and

Lincove (2023) found that school choice programs often disadvantage families without the resources to manage long commutes (such as those lacking access to a car, flexible work schedules, or stable housing). School choice programs limit the ability of marginalized students to take advantage of higher-performing schools outside their immediate neighborhoods due to the lack of good access to transportation systems.

Consequently, these findings suggest that transportation infrastructure and policy shape whether students can attend high-performing schools or not. When access depends on long and inconsistent commutes, the practical opportunity to benefit from school choice becomes unobtainable for some. This burden falls disproportionately on students of color and low-income families, reinforcing the educational inequities that school choice policies aim to address. By incorporating racial and socioeconomic variables into my analysis, my study seeks to better understand how the neglect of transportation equity in school assignment systems may impact academic performance across SFUSD high schools.

III. Commute Time and Academic Performance

A growing body of evidence has shown that extended student commute times can hinder academic achievement because it diminishes students' physical and cognitive capabilities (Ding & Feng, 2022; Voulgaris et al., 2017). Voulgaris et al. (2017), using data from the American Time Use Survey, found that each additional minute of commute time for high school students was associated with 1.3 fewer minutes of sleep and 0.32 fewer minutes of physical activity. This loss of rest and movement contributes to increased fatigue and reduced academic focus, which is detrimental for a student's academic development. Additionally, Kaushik et al. (2023) expanded on this finding by identifying a significant negative correlation between commute time and GPA. They highlighted increased stress and reduced academic engagement, driven by fatigue and lack

of sleep, as key factors explaining why longer commute times can adversely affect academic performance.

These findings suggest that long commute times can directly impact students' ability to succeed academically by reducing the student's time available for sleep, study, and extracurricular activities, and by increasing students' levels of stress and fatigue. While some of this research has been conducted outside the United States or with post-secondary populations, the mechanisms are likely applicable to U.S. high school students, particularly in urban areas like San Francisco. My study builds on these findings by testing whether the hypothesized academic costs of long commutes are reflected in standardized test outcomes across SFUSD high schools. Specifically, my study offers a localized perspective from San Francisco, where commuting patterns are shaped by both school choice policies and broader structural inequalities, including access to public transportation and disparities in school funding.

IV. Contribution to Literature

While existing literature establishes the link between commute time and student well-being, and highlights racial disparities in transportation access, relatively few studies have directly measured how commute time influences standardized academic performance in the high school context for urban settings with semi-choice-based school systems. Thus, this study contributes to the literature by explicitly measuring the relationship between estimated average student commute time and academic performance at the high school level using public transportation and standardized testing data from California Department of Education and the American Community Survey (ACS). In doing so, I hope to clarify whether commute time functions are actually a barrier to academic success for SFUSD high school students or merely a

pattern that occurs for students within a constrained educational and unreliable transportation system.

Hypothesis and Theory Section

I hypothesize that high schools with shorter-than-average student commute times will demonstrate higher academic performance than schools with longer average commutes.

Conceptually, I expect that as commute times increase, academic performance decreases. To operationalize this hypothesis, I predict that for every additional minute of average student commute time, there will be a proportional decrease in the percentage of SFUSD high school students meeting or exceeding standards on the CAASPP exam.

One of the many causal mechanisms that underlines this hypothesis is based around transportation equity. From the perspective of transportation, longer commutes can reduce students' time to sleep, study, and engage in extracurricular activities (Voulgaris et al., 2017; Ding & Feng, 2022). Consequently, inequal distribution of transportation access may increase fatigue, stress, and absenteeism, which can impair students' ability to concentrate, academic motivation, and overall educational outcomes. Thus, students who attend schools closer to home potentially benefit from more time to rest, prepare for classes, and participate in school-related activities, which can potentially lead to a more positive academic performance.

Additionally, commute times highlight the destructive nature of structural barriers. As the literature shown above, not all students face the same barriers in accessing high-quality schools (Valant & Lincove, 2023; Weinstein et al., 2022). Students of color and those from low-income neighborhoods often experience longer commutes due to historical redlining, uneven school quality across neighborhoods, and limited access to district-provided transportation (SFUSD,

2020). Thus, commute time may not only affect learning directly, through fatigue or lack of time, but also indirectly indicates the inequitable access to opportunity for people of color.

These mechanisms of transportation inequity and structural barriers suggest that students commuting farther face disproportionate challenges that can hinder academic achievement. On top of that, these mechanisms are in accord with prior empirical findings that show how structural inequalities evidentially introduce commute burdens, which disproportionately affect historically marginalized communities (Kaushik et al., 2023; Lutz et al., 2024). Therefore, by testing this hypothesis within San Francisco's unique school choice and transit landscape, this study contributes to an existing theoretical framework on time constraints, cognitive load, and the unequal access to educational resources in urban regions (Voulgaris et al., 2017; Kaushik et al., 2024).

Research Design

I. Unit of Analysis and Scope

My study analyzes all 17 public high schools in the San Francisco Unified School District (SFUSD) from the 2016-2017 through the 2022–2023 academic years, yielding a total $N = 119$ school-years observations. To be specific, the unit of analysis for this study is: high schools in SFUSD from a given academic year during 2016-2017 to 2022-2023. This unit of analysis allows me to examine high school standardized test performance patterns in relation to average student commute time, using a cross-sectional time series analysis. This study covers a seven-year period, allowing me to compare the effects of how commuting to high school has change across the years for SFUSD students and how this effect change in commuting affects SFUSD high school students' testing capabilities.

II. Independent Variable (IV): Commute Time

For my independent variable (IV), average student commute time per SFUSD high school from 2017 to 2023 was used. Using publicly available commuting time data provided by the American Community Survey (ACS), the variable is measured by averaging the commute times from the top three student-populated zip codes for each high school for every year. The top three student-populated zip codes were determined, using the SFUSD public dashboard, which provided the percentages of students located within San Francisco for a given school year.

My independent variable measure (average commute time) is meant to serve as a proxy for the average time it takes for students to reach their assigned school. This approach is designed to approximate the typical travel time students face when attending each school, due to the lack of individual-level travel data provided.

Commute times were chosen as my independent variable because it serves as a measurable proxy for access to educational opportunities and is the main interest of this study. In a choice-based district, like San Francisco, where students are not assigned to schools by proximity, commute time captures both the logistical and structural challenges students face when attempting to attend higher-performing schools outside their immediate neighborhoods.

Commute times reflects broader patterns of spatial inequality, public transportation access, and historical segregation, all of which may directly negatively affect academic outcomes. By using commute time as my explanatory variable, I aim to assess whether the burdens of traveling to school is linked to measurable differences in SFUSD student performance.

III. Dependent Variable (DV): Academic Performance

For my dependent variable (DV), academic performance is measured using the percentage of students who scored “Standard Met” or “Standard Exceeded” on the California

Assessment of Student Performance and Progress (CAASPP) exams in Math and English Language Arts (ELA) for each of the 17 high schools from 2017 to 2023. These scores are publicly reported annually at the school level by the California Department of Education and represent SFUSD's official metric for student achievement.

This dependent variable was selected because CAASPP scores offer a standardized and comparable measure of academic performance across schools and years. Unlike GPA or course grades, which may vary in rigor depending on the school or teacher, CAASPP results are based on uniform assessments administered under consistent conditions statewide. Additionally, using the "Standard Met" and "Standard Exceeded" results for my analysis, allows me to establish a clear academic performance threshold that aligns with the expectations for academic success. Therefore, these scores will provide a reliable measure for evaluating SFUSD high school academic outcomes in relation to average student commute times.

IV. Control Variables

To isolate the impact of commuting time from confounding variables of academic performance, several demographics (such as parent's educational attainment, socioeconomic status, and race) control variables were selected to control for structural differences between SFUSD schools that could confound the relationship between commute time and academic outcomes.

For my race and ethnicity control variable, using publicly available data provided from the California Department of Education, I gathered percentages of Asian, Black, Latino, and White students at each school for each school year. Racial and ethnicity are included because academic performance is often correlated with race due to longstanding educational and

socioeconomic disparities rooted in San Francisco's historical educational segregation and resource allocation (SFUSD, 2020).

For my second control variable, using publicly available data provided from the California Department of Education, socioeconomic status was measured via the percentage of students eligible for free or reduced-price lunch (FRL), which will serve as a proxy for family income. Schools serving a higher percentage of low-income students may face resource constraints that negatively influence the quality of education provided and students' academic performance.

Lastly, parent educational attainment was measured using data provided by the ACS, where this variable is measured by averaging the percentage of residents with bachelor's degrees or higher from the top three student-populated zip codes for each high school for every year. Parental education attainment was chosen as a control because it is a strong predictor of student academic success and highlights the educational habit of high school students' differences between households of high-educated people and households of people without degrees.

Research Methods

To assess the relationship between commute time and student performance, I employed an ordinary least squares (OLS) regression, using school-year level data provided from the California Department of Education. However, separate regressions were conducted for Math and ELA CAASPP outcomes. All models controlled for racial and socioeconomic variables. The general OLS regression model I implemented took the form of:

$$\widehat{\text{Academic Performance}}_{it} = \beta_0 + \beta_1 \widehat{\text{Commute Time}}_{it} + \beta_k K_{it} + \varepsilon_{it} \quad (1)$$

Academic Performance refers to the CAASPP outcomes (Math and ELA) for SFUSD high schools (i) during a specific academic school year (t), which is dependent on the average

commute time and demographic control variables. Additionally, for (1), I express the controls for my causal relationship as K_{it} , which contains the various demographic control variables included into my regression model (i.e. parent's education, socioeconomic status, and race). The β of each variable represents the level of the relationship (effect) between the respective variable and academic performance. This design is an example of my regressions used to explore the relationship of average commute times on academic performance, while also controlling for relevant confounding factors (control).

Results

As mentioned above, to evaluate whether average student commute times influence academic performance in San Francisco high schools, I analyzed data from 17 SFUSD high schools between 2017 and 2023. Using OLS regression models, I examined the relationship between average commute time and the percentage of students meeting or exceeding standards on the CAASPP Math and ELA exams. Below, I present three visualizations that identify the relationship between commute times and different test performances without controlling for confounds and the regression results of both associations once key demographic variables are controlled for.

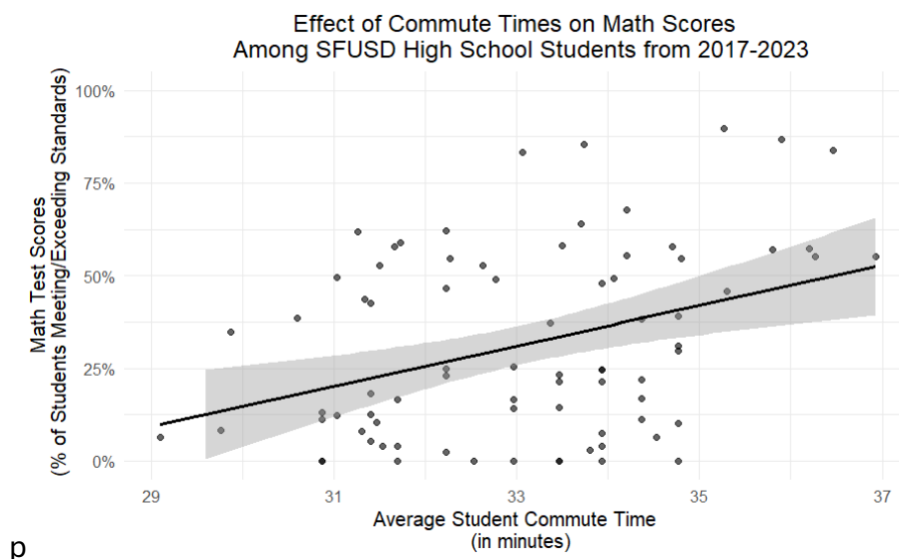


Figure 2. Effect of Commute Times on Math Test Scores Among SFUSD High School Students from 2017-2023 (ACS and California Department of Education, 2017-2023)

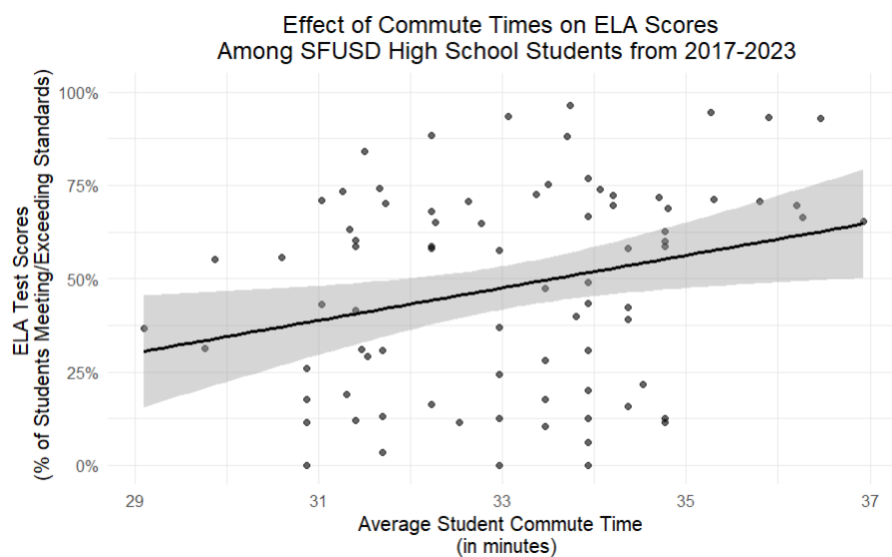


Figure 3. Effect of Commute Times on ELA Test Scores Among SFUSD High School Students from 2017-2023 (ACS and California Department of Education, 2017-2023)

Figure 2 and 3 includes regression scatter plots of average student commute times of high schools on CAASPP test scores (in Math and ELA), calculated using data provided from the American Community Survey and California Department of Education. For both Figure 2 and

Figure 3, without controlling for confounding variables, moderate positive correlations are shown for average SFUSD student commute times on both Math and ELA CAASPP test scores. This indicates that commuting times may positively increase the academic performances of SFUSD students. To be specific, these regression scatterplots suggest that for every additional minute in commute time for a SFUSD student, a proportional increase in CAASPP test scores (for both Math and ELA) should be expected.

However, Table 1 reveals an inverse association compared to the correlational results shown in Figure 3. Specifically, after controlling for socioeconomic and racial status, each additional minute of average student commuting time is associated with a 0.3 percentage point decrease in CAASPP ELA scores. Contrastingly, the positive association from Figure 2 between commute time and Math scores remains, Table 1 identified that for every additional minute in average student commuting time led to a 1 percentage point increase in CAASPP Math scores. Nonetheless, neither of these relationships reached statistical significance, suggesting that these observed trends between commuting times and academic performances may be pure incidental or influenced by unmeasured variables.

Regression Results with Controls		
=====		
Dependent variable:		

Test Score		
	ELA High (1)	Math High (2)
-----	-----	-----
Avg Travel Time	-0.003 (0.01)	0.01 (0.01)
Parent Education	-0.03 (0.37)	0.16 (0.27)
% Free Lunch	-1.24*** (0.22)	-0.64*** (0.15)
% Asian	0.0004*** (0.0001)	0.0003*** (0.0000)
% Black	0.001 (0.001)	-0.0003 (0.0004)

% Hispanic	-0.0003* (0.0002)	-0.0001 (0.0001)
% white	-0.001* (0.0003)	0.0004 (0.0002)
% Mixed	0.001 (0.001)	-0.001 (0.001)
Constant	1.25** (0.51)	0.19 (0.36)

Observations	81	79
Log Likelihood	49.06	74.75
Akaike Inf. Crit.	-80.13	-131.50
=====		
Note:	*p<0.1; **p<0.05; ***p<0.01	

Table 1. Regression Results of Effect of Commute Times on Test Scores (SFUSD, ACS, and California Department of Education, 2017-2023)

The lack of significance for average commuting times suggests that it may not be a strong predictor of academic performance. Instead, the most influential variables in Table 1 were control indicators of socioeconomic status and race. Specifically, the percentage of students eligible for free or reduced-price lunch (FRL) had the strongest association with both Math and ELA scores, with statistically significant at the 1% level. A 1 percentage point increase in FRL corresponded with a 1.24% drop in ELA scores and a 0.64% drop in Math scores. Racial composition also showed small but statistically significant associations, where higher percentages of Asian students predicted slight increases in both test scores (0.04 % increase for ELA and 0.03% increase for Math) and higher percentages of Hispanic and White students were associated with minor declines in ELA scores.

Unfortunately, the results obtained from Table 1 and both Figures 2 & 3 are not enough to support my original hypothesis that longer than average commute times would lead to worse academic performance. While a weak negative effect was observed for ELA for increasing average commute times, the unexpected positive trend in Math outcomes and the absence of statistical significance limit any strong indication for causality. Ultimately, my analysis suggests that commute time may be a less determining factor of academic success and more as a proxy for

other underlying structural barriers, such as poverty and racial inequality that shape educational opportunities in SFUSD.

Discussion and Implications

In the beginning of my study, I set out to determine whether average student commute time affects academic performance across San Francisco's public high schools from academic years 2016–2017 to 2022–2023. I was particularly interested in whether schools with longer than average commute times had lower rates of students meeting or exceeding standards on the CAASPP exams in Math and English Language Arts (ELA). I hypothesized that longer commute times would correspond with lower academic performance, as extended commuting time could reduce time for sleep, study, and extracurricular activities, and might reflect broader structural barriers to educational access (Voulgaris et al., 2017; Kaushik et al., 2024).

Ultimately, the findings of my study did not support this hypothesis. While the data revealed a slight negative association between average commute times and ELA performance and a slight positive association between commute time and Math performance, neither of these relationships were statistically significant. These results suggests that average commute time, at least at the school level, may not be a strong or consistent predictor of academic achievement for San Francisco students.

However, the analysis did uncover meaningful patterns. The strongest predictors of academic performance were indicators of socioeconomic and racial status. Specifically, eligibility for free or reduced-price lunch (FRL), used as a proxy for economic disadvantage schools, was strongly and negatively associated with student education outcomes. Schools with higher percentages of FRL-eligible students significantly performed worse than schools with

lower FRL rates on the CAASPP exams, highlighting how poverty can limit access to academic support and opportunities.

Additionally, racial composition mattered in predicting academic performance outcomes. As shown in the results, schools with higher percentages of Asian students consistently showed stronger performance on both Math and ELA exams, while higher percentages of Hispanic and White students were slightly associated with lower ELA scores. These patterns suggest that commute time may not play a primary role in explaining academic performance but instead serve as an indicator of deeper structural inequities (such as poverty and racial inequality) that have a more direct impact on educational outcomes.

These findings have important implications for equity in education policy, particularly in cities that implement school choice systems. Even though SFUSD's lottery-choice based enrollment was intended to promote equity, the ability to benefit from this system is not evenly distributed among SFUSD students. In the context of how commuting times may impact academic performance, a household income inequality gap exists. Wealthier households with cars and flexible work schedules are often in a better position to ignore long commutes across the city and take advantage of higher quality education. While poorer households, without such advantages, may face daily obstacles (longer commutes, inconsistent transit access, and limited flexibility) that limit their access to better education, regardless of their ability of school choice.

Overall, while my hypothesis was not supported by statistically significant findings, this study highlights how commute time intersects with broader patterns of educational inequality. Commute time may not directly reduce academic performance, but it represents larger systematic barriers that determine which students can realistically access high-quality education. Addressing transportation barriers and structural barriers, such as funding disparities, residential segregation,

and unequal access to resources, is necessary for ensuring that school choice fulfills its promise of equitable opportunity for all students.

Limitations and Future Research

In terms of research limitations, several data availability issues significantly impacted my findings and represent areas for improvement in future studies. Most notably, I lacked access to individualized student-level data due to confidentiality restrictions. As a result, I was unable to obtain actual daily commute times for SFUSD high school students. Instead, I relied on estimated average commute times based on the top three student-populated ZIP codes for each school, using data from the American Community Survey (ACS). While this method offered a reasonable school-level approximation of student commute times, it likely obscures variation within schools and may not fully capture students' daily travel experiences. Future research should seek partnerships with SFUSD or San Francisco transit agencies to obtain anonymized, student-level transportation data that could improve the precision and validity of commute time measurement.

In addition, my dependent variable was also measured at the school level using aggregated CAASPP scores. This decision limited my ability to explore within-school variation or examine how commuting can differentially impact subgroups of students, such as those from low-income households or students without access to private transportation. As a result, I could not assess how commuting time interacts with other equity factors like household income or residential stability. Future research should aim to use individual-level performance data in combination with detailed demographic and transportation information.

Due to data limitations, I was also unable to include several important control variables that prior research has shown to influence academic outcomes. For example, variables such as

academic motivation, average sleep duration, perceived stress, and parental involvement would have offered important context in isolating the effects of commute time (Voulgaris et al., 2017; Kaushik et al., 2024). Including these psychosocial and behavioral measures could provide a more complete understanding of how the physical and mental toll of commuting shapes student learning and performance.

Additionally, in hindsight, I would consider restructuring my independent variable. Rather than relying on a single average commute time per school, future studies could separate commuting data by transportation mode (such as public bus, rail, private car, or walking) to examine how different commute types of impact students in distinct ways. In a city like San Francisco, where access to reliable transit varies greatly by neighborhood, mode of transportation could identify meaningful education-transportation challenges when it comes to discussing the relationship between commute time and academic outcomes.

In summary, the primary limitation of this study lies in my reliance on school-level data, which restricted my ability to analyze variation across students and contextualize the commute experience to students. While this study provides a starting point for understanding how travel time relates to educational outcomes, in San Francisco, future research should build on these findings by incorporating more granular, student-level data and exploring alternative measures such as mode of transportation, attendance, and well-being. Future research would offer a deeper insight into how structural barriers related to geography, transit access, and economic inequality shape educational opportunities in urban school systems like SFUSD.

Conclusion

This study set out to investigate whether student commute time affects academic performance in San Francisco's public high schools between the academic years of 2016-2017

and 2022-2023. While the analysis did not find a statistically significant relationship between average commute time and standardized test performance in Math or English Language Arts, it uncovered meaningful patterns that point to broader educational and transportation inequities. Specifically, indicators of socioeconomic status (specifically eligibility for free or reduced-price lunch) and racial status were the most significant predictors of academic outcomes. These findings suggest that commuting time may not necessarily affect academic performance. However, the findings do show that commute times may represent more as a measure for deeper structural barriers in SFUSD, such as poverty, racial inequalities, and unequal access to well-resourced schools. The findings suggest that wealthier families can sustain the costs of long commutes to access better education, while lower-income households face daily obstacles that limit their ability to perform academically well and benefit from school choice.

Though my original hypothesis was not supported, my research contributes to a deeper understanding of how transportation, housing, and school access intersect in shaping student opportunity. In cities like San Francisco, where school choice policies are designed to foster equity, the ability to take advantage of these options are still constrained by geography, transit infrastructure, and economic resources. As such, policies intended to promote educational access must also account for the transportation burdens that disproportionately affect marginalized students. By drawing attention to these connections, my study offers a foundation for future research and policymaking aimed at helping make urban school systems more equitable for all students.

Citations

Bay Area Rapid Transit (BART). (2025). A history of BART: The concept is born.

<https://www.bart.gov/about/history>

Ding, P., & Feng, S. (2022). How School Travel Affects Children's Psychological Well-Being and Academic Achievement in China. *International journal of environmental research and public health*, 19(21), 13881. <https://doi.org/10.3390/ijerph192113881>

Lutz, K. L., S. B. Rakowska, and M. D. Adams. (2024). Examining the impacts of school bus travel on students' academic performance in two major cities. *Canadian Geographies / Géographies canadiennes*, 68, 603–614. <https://doi.org/10.1111/cag.12957>

Jamil, D., Rayyan , M., Abdulla Hameed , A. K., Masood , F., Javed , P., & Sreejith, A. (2022). The Impact of Commute on Students' Performance. *Journal of Medical and Health Studies*, 3(3), 59-67. <https://doi.org/10.32996/jmhs.2022.3.3.9>

Kaushik, A., Rai, S., Thakur, G., & Kumar, P. (2023). Effect of commuting on the academic performance of students in higher technical education and their physical and emotional state. *Innovations in Education and Teaching International*, 61(4), 691–702. <https://doi.org/10.1080/14703297.2023.2216677>

Lanuza, S. G. (2024, April 22). A legacy of separation: Connecting San Francisco's history of redlining to the educational disparities in SFUSD. *Berkeley Political Review*. <https://bpr.studentorg.berkeley.edu/2024/04/22/a-legacy-of-separation-connecting-san-franciscos-history-of-redlining-to-the-educational-disparities-in-sfusd/>

Robinson, R. (2015, January 29). Transportation challenges complicate school choice for S.F. students. *San Francisco Public Press*. <https://www.sfpublicpress.org/transportation-challenges-complicate-school-choice-for-s-f-students/>

Sattin-Bajaj, C., & Roda, A. (2018). Opportunity Hoarding in School Choice Contexts: The Role of Policy Design in Promoting Middle-Class Parents' Exclusionary Behaviors. *Educational Policy*, 34(7), 992-1035. <https://doi.org/10.1177/0895904818802106>

San Francisco Unified School District (SFUSD). (2020, September 16). Facing our past, changing our future, Part I: A century of segregation in San Francisco Unified School District (1851–1971). <https://www.sfusd.edu/facing-our-past-changing-our-future-part-i-century-segregation-san-francisco-unified-school-district>

San Francisco Unified School District (SFUSD). (2020, September 16). Facing our past, changing our future, Part II: Five decades of desegregation in SFUSD (1971–today). <https://www.sfusd.edu/facing-our-past-changing-our-future-part-ii-five-decades-desegregation-sfusd-1971-today>

San Francisco Municipal Transportation Agency (MUNI). (2025). Muni history <https://www.sfmta.com/getting-around/muni/muni-history>

Sharma, S., & Levinson, D. (2019). Travel cost and dropout from secondary schools in Nepal. *Transportation Research Part A: Policy and Practice*, 130, 385–397. <https://doi.org/10.1016/j.tra.2019.09.010>

Valant, J., & Lincove, J. A. (2023). Transportation Inequities and School Choice: How Car, Public Transit, and School Bus Access Affect Families' Options. *Educational Researcher*, 52(9), 535-543. <https://doi.org/10.3102/0013189X231189465>

Voulgaris, C. T., Smart, M. J., & Taylor, B. D. (2017). Tired of Commuting? Relationships among Journeys to School, Sleep, and Exercise among American Teenagers. *Journal of Planning Education and Research*, 39(2), 142-154. <https://doi.org/10.1177/0739456X17725148>

Weinstein, M., Cordes, S. A., Rick, C., & Schwartz, A. E. (2022). Riding the Yellow School Bus: Equity in bus transportation across districts, schools, and students. *Urban Education*, 59(9), 2649-2683. <https://doi.org/10.1177/00420859221114084>

Supreme Court Decisions:

Johnson v. San Francisco Unified School District, 339 F. Supp. 1315 (N.D. Cal. 1971)

Tape v. Hurley, 66 Cal. 473, 6 P. 129 (Cal. 1885).