“Wealth in Transit: How Public Transportation Shapes Employment in the Bay Area”

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Employment is sometimes seen as the driver of populations, but it takes an intricate network of roads and railways to drive those populations to their employment. San Francisco is an anomaly in the overall landscape of American cities and the income of their commuters, as the median income for San Franciscan workers who use public transit has outpaced that of commuters by car by a remarkable amount. An exploration of this abnormality reveals a complex relationship between geographical opportunity and employment. This is relevant to the development of solutions for Northern and Central California's increasing commuting difficulties. Through this paper, I explore the effect income has on travel time for commuters who work in San Francisco, as well as the role that a commuter's method of transit and the industry they work in. This will be accomplished with a statistical analysis of Census data and consideration given to relevant literature on public transit in the Bay Area to uncover the association between method of transit and commuter income for workers. These findings may be critical in guiding future policy implementing improvements to public transportation across California and decreasing economic disparities by eliminating geographic barriers.

Context and Significance

Public transportation is a resource used by millions of people to commute to work every day and the same is true in San Francisco, a city where 20.2% of its commuters use public transit (Census ACS). The city differs from others across the United States though, as its commuters who use public transit to commute to work in the city have a median income of $80,820 while commuters who drive alone in their cars earn a median income of $72,149 (Census ACS). This nearly eight thousand dollar pay disparity is significant because in most American cities, transit commuters earn less than car commuters, but in San Francisco we see the opposite occuring. It is

fitting that San Francisco's public transit is unique in its own way, as the city has a rich history of breaking norms compared to the rest of the country.

For example, in Austin, Texas, there's as high as a $17,000 difference in median earnings between the two categories of commuter and while other notable exceptions to public transit users earning a lower median income can be found in Washington DC and Chicago, these only see a difference of around $4,000 in favor of public transit users (Ortegren). This is a very broad abnormality that may reveal vital ways in which public transit could be expanded or otherwise restructured to benefit workers regardless of income levels in the wider context of American commuters.

San Francisco is one of the most economically significant cities in California, as one might expect from a city with a higher global domestic product than the cities of Beijing or Washington DC (Statista). The city has a population of over 870,000 residents (Census) and GDP of 654.73 billion dollars as of 2022 in its overall metro area (Statista), it's a city of tremendous financial opportunity hindered by its high cost of living. This influences many of its workers to commute from the greater Bay Area or further inland as a means of maintaining access to this wealth of labor opportunities.

The Bay Area Rapid Transit, or BART, system is an important series of railway corridors that facilitate the commute of hundreds of thousands of workers from counties such as San Mateo or Alameda. BART was used for 4,767,259 unlinked passenger trips in May 2024 alone, and despite concerns around fare evasion, the rail system yields nearly 750 million dollars in revenue every year (National Transportation Database). This evident demand for access to easier commutes to San Francisco is important as a means of assessing how geographic location

influences the income of workers. An understanding of how best to expand the BART and these other systems could lead to improved employment opportunities.

Literature Review

Existing research on public transit use in the Bay Area specifically related to BART indicates that there is high demand for reliable long distance transit as a result of housing shortages and high costs of living that have ultimately led to high congestion for key modes of transportation.

It is widely accepted that the Bay Area job market has attracted many workers from across Northern California, which has contributed to its growth and thus its increased housing costs over the last century as the cycle of real estate appreciation continues (Wasserman). A steady increase in commuters from as far as 50 or more miles away has also been observed as a growing phenomenon, as the increasing Bay Area population and influx of commuters from the Central Valley and further along the coasts all crowd onto the same highways and trains. Research done by UCLA professor John Wasserman on pre-pandemic BART data further found that ridership can be strongly predicted by population density around destination stations in the morning. and by a commuter's origin stations see the highest traffic in the evening, which he found to indicate a rising problem of overcrowding and density of commuter use during peak hours when workers would be going to and from work.

While rates of super commuter have been stable in the Central Valley, it was found that the overall quantity has still increased as a result of population growth at rates that remain problematic for the currently used infrastructure of San Francisco, and commuting hubs such as Salinas and Hollister have only increased in their super commuter populations (Boarnet et al). Time competition such as this is a major hurdle when designing methods of public transit, and

BART congestion during critical work hours in both the morning and early evening have become increasingly untenable (BART.gov). These surges have been indicative of how popular the service is for the purpose of commuting and despite BART and CalTrans both developing surge pricing plans to increase revenue during this time to fund future expansions to the system, such changes won't be ready for nearly a decade.

Expanding the BART, or other railways such as CalTrans, could thus lead to a reduction in freeway congestion from super commuters and both benefit them and those who work closer to home but still use highways. Expanded BART corridors have historically corresponded with an increase in housing developments nearby, as housing near such stations has been very popular with those seeking convenient access to the BART system (Cervero). This trend has been a driving factor in population growth in the wider Bay Area over the last several decades, which has led to the areas surrounding San Francisco to rise in price to the point of previously affordable areas becoming overly expensive and pushing commuters further away from the City. This being said, expansion of the BART network has been in development as a means of addressing high passenger density during peak hours, with plans in place for a $3.5 billion dollar operational capacity upgrade to the system that should be complete by 2030 and plans projected as far as 2024 with an estimated cost of $29 billion (Wasserman).

Though less crowded commutes are a positive improvement to the Bay Area's high speed rail system, there are concerns about the high initial and continued operational costs these expansions may lead to in exchange for a small potential increase in ridership and decreased density. According to Pew Research data, Americans tend to be more sensitive to dissatisfaction with regards to pay or promotion than they are their commute, meaning a decrease in BART density may not have substantial benefits relative to their cost on an individual level, unless such

a thing was able to increase their income in a meaningful capacity. The tendency of these workers is to focus on their satisfaction derived from the work they perform rather than the commute needed to take them to their job sites is important in understanding the needs of these commuters, and the nearly 90% of super commuters who drive alone from the Central Valley show a high tolerance for long commutes as well (Boarnet et al).

Los Angeles is home to much more car-centric infrastructure than San Francisco and consequently struggles with different problems. It's the largest city in California with a population of 4.8 million people and a slightly higher GDP than San Francisco, although the city has a lower median income of $46,089 compared to San Francisco's median income of $82,598 (Census ACS). However, in addition to having six times the population of San Francisco, the city has been experiencing noticeable shortages in public transportation that effects ranging from decreased employment opportunities to temporal barriers in the way of food and healthcare. While Los Angeles has 186,233 commuters by public transit than San Francisco's 122,037 as of 2022, they make up less than 4% of L.A's overall population and thus their infrastructure lacks in relation to population. Since the pandemic, there was a 5% decrease in accessible jobs with a 45 minute commute time, while travel time to Los Angeles hospitals via public transit also takes roughly four times as long as driving (TransitCenter). Travel time to nearby grocery stores takes roughly twice as long by public transit as well, with an average difference of 5 minutes compared to 12 minutes. This poses a significant disadvantage to people who rely on public transportation in Los Angeles, who spend larger portions of their day in transit than otherwise could. Understanding how the cities' commutes differ is an important step in figuring out how to improve them though, as differences in commute time and commonly worked industries may cause the needs of each city to vary from each other and require more unique solutions.

As a major hub of economic activity in the northern Central Valley as well as being the state capital, Sacramento is one of the most important cities in California and has a competitive job market with many opportunities in government and political advocacy. It also has a median income level of $51,323 (Census ACS), which places it well above Los Angeles while trailing behind San Francisco. The Central Valley has a super commuting share of 8%, which is double the national average and four times the super commuter population of much of the Bay Area (Boarnet et al). Sacramento also lacks direct rail access to San Francisco, which has led many of its super commuters to instead rely on its highways to get to the city. With 97% of its super commuter population commuting by car, either alone or by carpool, highways leading out of Sacramento take on an unsustainable quantity of long distance traffic (Boarnet et al). Developing a solution to this congestion would thus benefit not only Sacramento by connecting residents with higher paying jobs, but connect the wider Northern Central Valley with a smoother gateway through which its commuters can funnel in and out of the Bay through.

The Gordian Knot of reducing congestion of San Franciscan traffic has many possible solutions, but the multifaceted nature of the reasons millions of people use public services from various counties for a host of different reasons has kept the hands of policymakers tied out of fears of further inefficiency and overspending. Super commuters are a symptom of a mismatch between accessible jobs and available housing, so understanding how and why certain cities have seen significant rises in their numbers is the first step in identifying how to address them. If the reason for increasing super commuting rates is the prosperous job market of San Francisco, then finding ways to provide the wider commuting population with reliable and high speed public works to ease access to those jobs should be a policy priority. Comparison between San

Francisco and other major cities is a relevant way of assessing how these policy priorities would function and how they could be applied to the wider state of California.

Theory and Mechanisms

Exploring the wider context of commuting in the Bay Area led me to speculate how the causal mechanisms that led to San Francisco's median income disparity amongst commuters may function. My conceptual hypothesis is that reliable access to public transit is a highly sought after resource that high income homeowners and renters have been pushing lower income workers out of over time. This is because of the barrier housing poses to job access and while multi-family housing developments tend to be built in response to the presence of a BART station (Cervero). As a means of testing this connection, I will be running tests to see the correlation between income and travel time of a worker's commute.

My operational hypothesis is that if San Franciscan commuters have a high income, they will be more likely to have shorter commute times as a result of the housing they can afford. My theory is that workers are willing to spend a longer time in transit for higher pay. While public transportation does tend to take 5-15 additional minutes on average compared to commuting by car (Census), it is cheaper than driving. Public transportation will be more frequently used by people who travel long distances for high pay despite longer travel times. Public transit will also be popular with workers who earn low incomes, which is apparent from commuters within San Francisco, as commuters who earn less than $100,000 annually were three times as likely to use a bus than people who earn more than that (SFMTA). Public transit is a cost effective option for commuting, which is a substantial reason that low income commuters make use of it rather than driving their own vehicles. This gives the relationship between income and frequency of use by

commuters an inverted bell curve shape, where driving a car becomes the dominantly used method of transit of the middle class while public transportation is used by those on the edges.

Research Design

My research utilizes data from a 2022 1-year report Census's report "Means of Transportation to Work by Selected Characteristics for Workplace Geography", or Table 0804, to construct two separate tests, one being a statistical analysis and the other being a series of bar charts comparing trends in commuter behavior across san Francisco and two comparable cities. I solely used San Francisco's data for my statistical analysis, which had a population size of 603,177 commuters. My temporal and geographic scopes for my statistical analysis will be limited to employees who worked in San Francisco county over the course of 2022. The influence of the pandemic on transportation habits combined with pre-COVID behavior from a broader timespan may have portrayed an inaccurate version of the current reality of commuting in San Francisco county.

My independent variable is the income of commuters, as the initial economic privileges or disadvantages afforded by income level are of interest to me in how they affect commuting patterns. This data is displayed through percentages at certain intervals, for instance as the percent of commuters who spend 15-19 minutes commuting. My dependent variable is the time spent commuting, which will presumably be influenced by the independent variable to demonstrate the correlation between income and their subsequent housing. This data is again displayed through percentages at certain intervals, which can be tested alongside the rest of my variables.

Control variables I've selected for analysis are the method of transportation and industry of workers, both of which are measured in the Census report by the percentage of the population. The method of transportation used by commuters will ideally be used to reveal trends in the popularity of their use based on distance and affordability through their analysis alongside other variables. For instance, someone who is unable to afford or access a car may be forced to use the BART or another railway, while a high income worker who simply lives far away or would potentially be disadvantaged through the use of a highway may opt into using a train instead. I'm curious to see how visible this privilege of choice may be in my analyses or if it will be ultimately inconsequential. The industry of commuting workers is also relevant to this study due to the ways it can influence income and transportation. The Census data used to analyze consumer decisions shows a number of workers associated with technology, business, and sciences use public transit rather than automobiles, whereas government employees and education workers tend to use private methods of transit (Census ACS). Among super commuters, those who work in construction or manufacturing were more likely to travel long distances for work, regardless of income differences within these fields (Boarnet et al). Ideally this variable will be useful for inferring the reasons different workers fall into varying commuting patterns, whether it be due to the demands of certain careers or income.

For my first test, San Francisco commuters were sorted into three categories based on the method of commute they primarily utilize, those being driving alone, carpooling, and public transit. Their estimated populations' income levels were sorted into brackets identical to the ones used in the S0408 Census report the data was acquired from. The brackets span roughly 10,000 dollars and go as high as $75,000 or above.This test is an informative measurement of the strength of the relationship between the two categorical variables I've chosen to analyze.

My second comparison charted the distribution of two categories of commuters in San Francisco, Sacramento, and Los Angeles when compared using specific metrics. For these figures, I merged commuters who carpool and drive alone into one category and kept public transportation as its own category. Carpooling commuters make up a very small percentage of the populations of each city and merging the categories reduced the number of subpopulations examined from 9 to 6 while conveying information with no deviation from my thesis regarding disparities between car users and public transit users. In addition to the previous data adjustment, while the Census displays its data within the S0408 report as percentages within a subpopulation, I converted the data used in my graphs to instead show the percentages each subpopulation comprises in their respective cities. This highlights broader differences in overall usage of different modes of transit and overall distribution patterns across the control variables I examined.

Research Results

The results of my analyses were mixed and ultimately did not support my hypothesis, although they did reveal interesting trends that warrant future research. My Cramer's V analysis yielded a V value of 0.03, which is far below the threshold of statistical significance of 0.08 for this sample size. This assessment of the lack of a significant relationship between my independent and dependent variables offers no evidence for my theory of wealth drawing in commuters from long distances. However, my findings may have been altered by the limitations of my data and how the Census records annual wealth accrual through its income brackets.

Table 1

Cramer's V Analysis of San Francisco Commuters

Income Brackets	Car Solo (estimated)	Carpool (estimated)	Public Transit (estimated)
$1 to $9,999 or loss	12511.6	4538.695	9396.849
$10,000 to $14,999	6785.952	1277.885	4271.295
$15,000 to $24,999	13783.97	4274.305	7078.146
$25,000 to $34,999	17601.06	3172.68	8176.479
$35,000 to $49,999	23538.77	5375.93	12203.7
$50,000 to $64,999	23538.77	5067.475	11471.478
$65,000 to $74,999	12087.48	3260.81	6467.961
$75,000 or more	102001.3	17097.22	62849.055
Chi-square Statistic			2867.354
N			377828.9
Cramer's V			0.032926

Data Source : Census ACS

However, my next three figures provided very significant insight into commuter behavior. Across all three figures, it is notable that San Francisco dwarfs the other two cities in terms of its transit use, which explains the city's comparably smaller population of car commuters. San Francisco's commuter population percentage of 20.2% is very significant compared to Sacramento, where only 0.9% of the population commutes to work. Los Angeles has an overall car commuter population percent of 89.49% and overall population of 3,151,077, which indicates a heavy preference for cars by overall population, even if its use rate is lower than Sacramento.

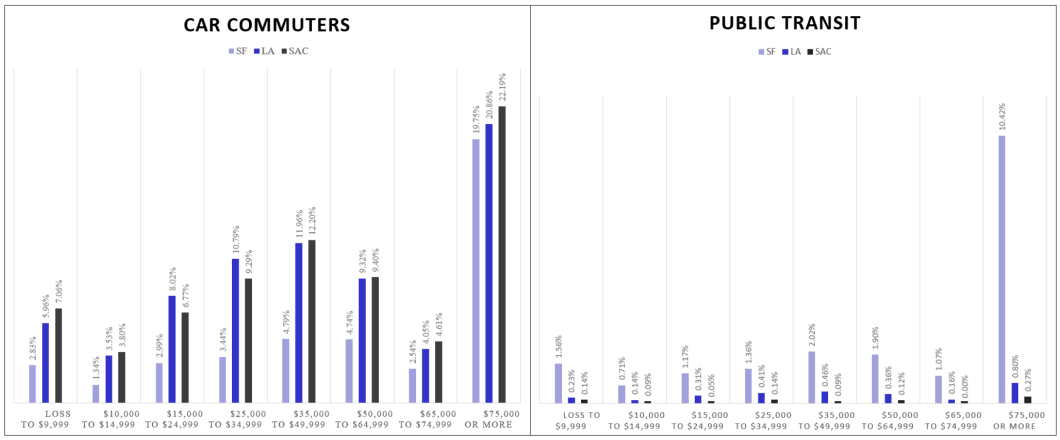
My first comparison of commuters and income showed that car use had a relatively high peak in the '$25,000 to $49,999' range within the low ranges but a sudden spike in the '$74,999 or More' category across all three cities. A simple explanation would be that earners above $75,000 are widely dispersed among the next dozen sets of income brackets, but are compressed into one category by the Census. The spike we see at the highest end of earnings is thus representative of an underexplored but broad population, which is emblematic of a major

limitation in available data from the Census. This suggests that car use is generally used by people who earn an income slightly below the median, with commuters who earn well above the median using cars at an overall high rate as well. This runs in contrast to the distribution of public transit users, where there's a slight dip between the lowest category and middle income, before another spike likely caused by the compression of higher income brackets.

Notably, all three cities had very small populations of commuters who earned $65,000 to $74,999 annually despite high populations who earn above that. My theory is that earners above $75,000 are widely dispersed among the next dozen sets of income brackets at rates similar to this apparent abnormality, so the spike of compressed high wage commuters mentioned prior is a compilation of several small populations summed up into one income bracket. This is a problem unique to the first figure and subsequent charts unaffected to the same extent.

Figure 1

Commuter Income by Population Percentage

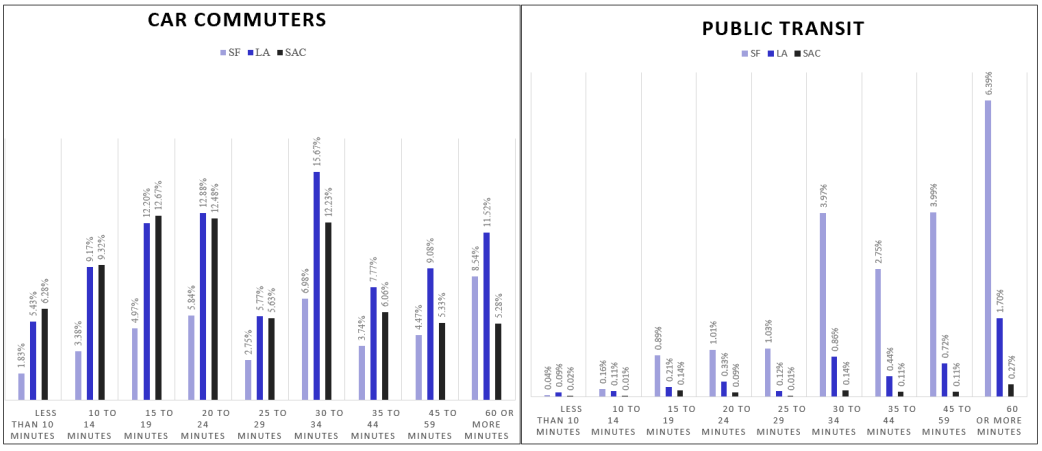


Data Source : Census ACS

My next comparison of commute duration revealed a general trend across all three cities in which a bimodal distribution appears with peaks in both the center and upper end of the data. Outside of a sharp drop in the '25 to 29 minutes' range for car commuters, the overall driving population skews left without major outliers except for an uptick in category of commute time of '60 minutes or above'. Public transportation sees a similar distribution in commute time between Los Angeles and Sacramento, but San Francisco sees a sharper uptick in commuters in the categories '30 minutes to 34 minutes', which is a distribution that holds true for the public transit using commuters of all three cities. The peak within the '30 minutes to 34 minutes' group also corresponds with a sharp uptick at the same point from commuters via car, which indicates a similar trend between populations. While the second uptick of commuters in the '60 minutes or above' group is likely due to the compression of commuter subpopulations akin to Figure 1, this spike is less severe than that of the last figure's disparity. Mean public transportation time across all three cities is roughly 45 to 50 minutes, so a higher population at that level is to be expected.

Figure 2

Length of Commute by Population Percentage

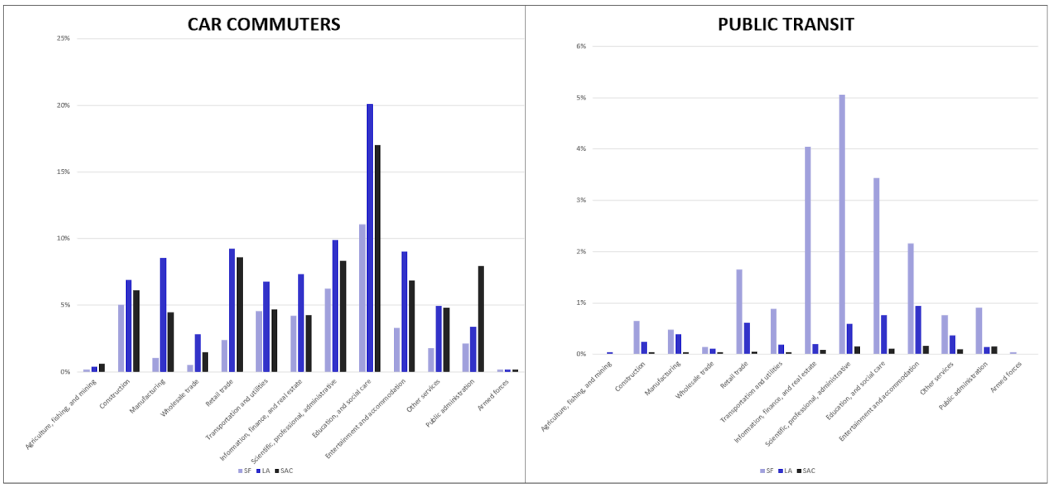


Data Source : Census ACS

My last figure compared the population percentage of the six commuter subtypes made up within their respective cities within specific industries. This chart visualized the fields commuters work in across the three cities, which illustrates significant differences in key areas that may explain reasons for economic divergences between cities. San Francisco had roughly half the number of workers in retail or manufacturing, two fields that pay typically low to middling wages. Contrarily, 24.2% of commuters work in professional, scientific, and management, and administrative and waste management services, compared to 13.7% of Los Angeles' population and 13% of Sacramento's. Professional jobs in business and technology tend to pay higher wages and are prominent within the wider Bay Area. The high presence of jobs in these fields is largely responsible for the high wealth that flows through San Francisco. Sacramento is also shown to have the highest population percentage of public administration positions at 8.1%, which ranges from state assemblymen to clerks at city hall. This is representative of the city's significance in California's political landscape.

Figure 3

Industry Worked in by Population Percentage



Data Source : Census ACS

Discussion and Implications

My findings revealed trends in commuter activity across the three figures that warrant further exploration. Despite its limits, Figure 1 established a valuable baseline for visualizing how wealth is distributed in the cities discussed, particularly with regards to the severity of wealth gaps in San Francisco and Los Angeles. It also confirmed my initial thoughts about the existence of an inverse bell curve based on rates of public transportation use amongst the provided income brackets, as low income and high income brackets tended to have higher rates of transit use than those in the middle brackets. This affirms the importance of public transportation as an option for low income workers, although this trend is already widely accepted. Its implications for commuters who lie in the '$75,000 or Above' bracket are made somewhat dubious due to the lack of information on the distribution of the population within that broad category. A future study would require access to more specialized data to draw firm conclusions about this group.

Figure 2 was able to identify the distribution pattern of high commute times coming from in San Francisco. The data used for this table didn't specify the distance from which commuters commute, which would have been way more useful for identifying super commuting patterns. The slight left skewed trend in San Francisco drivers is also representative of the growing super commuter population, as 8.54% of the city's drivers spend over an hour in the car to and from their occupations. This was the least revealing section, as the tendency of public transit to be slower than car commuting was already known.

Figure 3 revealed some of the starkest differences between the commuter populations, both with regards to method of transit and overall city population. The presence or absence of

abundant jobs in certain industries helps to assess the transportational needs of different demographics of commuters. Certain professions in fields such as construction or agriculture, tend to require a personal vehicle to transport tools and supplies, while jobs in finance or computer science have lighter material requirements. These professional necessities push workers in different industries with potential gaps in income towards different methods of transportation, which in turn may lead wealth to travel toward different regions.

The availability of jobs in high paying fields in these cities is likely to vary due to local industries. For instance, a Sacramento job in a technology related field may have a lower median income compared to a position in a San Francisco-based company due to differences in the prevalence of major tech companies, like Google or Dropbox who are able to pay more competitive wages than smaller companies. Los Angeles' entertainment industry is another example of abnormalities between city industries. In addition to having the highest population percentage of commuters working in entertainment at roughly 20% more than S.F and Sac (Census ACS), the presence of Hollywood and broader opportunities in the entertainment industry in L.A. may lead to quirks in worker income and commute not found in other cities. This is an extreme example of potential industry abnormality, but these differences are an important consideration when analyzing the economic outcome of a city.

In summary, San Francisco was an outlier among the three cities for its high rate of public transit use and overall higher median income level. The other cities examined displayed unique quirks of their own, especially Los Angeles with regards to its prominent local entertainment industries.

Limitations and Extensions

My research was hindered by a lack of access to available data on specific topics. The data obtained from the Census was broadly useful but it only provided overall percentages for how the populations within three categories of commuter (solo drivers, carpoolers, and public transit users) fall into the given ranges. Access to all 603,177 raw responses with the ability to sort them using the available criteria would have allowed me to construct tests comparing more specific variables than what the broad percentages allowed me to.

Access to commuter data with more specific descriptors for methods of transportation would have allowed for a greater depth of analysis, both in terms of public commuters and those who remain unknown. The category of public transportation didn't include people who commute via taxi, which may also include those who Uber to work. While Uber and taxi aren't typically services that I would expect to be widely used as a primary method of transit, differentiation between commuters who utilize trains or buses would have potentially reshaped the scope of my project. The two methods of public transit are distinct from one another in terms of overall capability. Trains are capable of moving greater distances at higher speeds, but bus networks are able to cover wider areas along frequently traveled streets rather than specific railways. Observing how use rate varies between these two methods of transportation would be important for more broadly assessing a city population's needs, but the available data did not allow this.

Beyond public transit, a largely unaccounted for portion of the population fell beyond the scope of publicly available data. About 30% of the surveyed commuter populations in the three cities I used didn't drive alone, carpool, or use public transportation (Census ACS). This population is 50% larger than San Francisco's population of commuters who use public

transportation and could have been valuable for understanding the population of San Francisco with specific privileges afforded by the city's compact and walkable nature. Commuters capable of renting or purchasing housing nearby to high paying jobs or transit stations may have much shorter commute times as they are able to walk or bike to work, although the Census provides no data for these hypothetical short distance commuters beyond the percentages shown in Figure 2.

As addressed when discussing the first figure of my study, the Census portrayed income brackets using a template that was inadequate for San Francisco or other cities with high outlying earners. While the highest tier being workers who earn $75,000 or more is informative in cities with a more typical median income, San Francisco workers as a whole have a median income of $82,598 (Census ACS). This compression of potentially distinct income brackets made assessing the extreme differences in economic opportunity that led San Francisco to have an abnormal ratio of median earnings for commuters of different transit methods impossible with the degree of accuracy needed to address the topic. This was especially problematic when it came to my statistical analysis. While the analysis itself indisputably shows insignificant support for my hypothesis, the significance of my findings may be subject to change if the full range of income was visible and thus accounted for in the Cramer's V test.

Given the opportunity, I try to focus my research on a specific industry in San Francisco to assess how commute times within it vary. Inflexibility in commute time in the field of construction, where commute distances show low variability between workers regardless of income (Boarnet et al), raised questions as to how certain fields of work differ with regards to different choices in transit use and commute duration. Under ideal circumstances, this would involve using data from two to four different companies in a specific industry but in distinctly

different locations, such as three different healthtech companies within San Francisco and Los Angeles, and comparing the commute times of different employees. However, a major limitation of this direction of study would be the availability of employee data. Companies may not keep track of such data or be otherwise unwilling to distribute it freely, meaning such clear data may not exist for my study.

I would also be curious to investigate how telecommuters operate in the current world. While the goal of my research was to find solutions that ignore abnormalities created by the pandemic, it would be interesting to see how opportunities to work virtually have affected San Francisco, especially when companies in tech, business, or other sorts of administration have begun offering generous options and are based in the city. This direction may incur the same problems as my previous idea, as such data may simply not be available to the public. A survey could be used to broadly collect data about telecommuters, although this would lack the geographic uniformity in respondents that data from select firms would have. This variation would complicate attempts to assess the role of public transit in the cities of telecommuters and would lead in a separate direction than the one I intended to pursue.

Conclusions

The commuter situation in San Francisco is complicated and not one fully addressed in my research. My hypothesis is that public transit will be more frequently used by people who travel long distances for high pay despite longer travel times was not supported by the statistical relationship between income and method of transportation in the city. Despite limitations in income data that obfuscates a more precise analysis of income, comparisons to Los Angeles and Sacramento provided areas of future exploration with regards to cross city trends that may

explain the still existing pay disparity. Differences in industry reveals new directions for research to take as a means of addressing the needs of workers across all fields of work.

San Francisco's public transportation system has such a high relative use rate across income levels compared to cities where such services are in desperate demand. The importance for cities such as Los Angeles or Sacramento to prioritize extended networks of bus routes and railways is evident through their own shortages and ought to be a policy priority. The connection of California cities and accessible housing is a constant struggle as areas become increasingly overcrowded and price out low income workers. As the price of living in major urban centers continues to rise, it seems that transportation policy remains stuck in smoggy gridlock.

Citations

"Property Value and Fiscal Benefits of Bart", Bart.gov (2014), retrieved 8/2/24 from : https://www.bart.gov/sites/default/files/docs/2014-08%20BARTPropValues_Final_0.pdf

"BART Facts 2023", Bart.gov (2023), Retrieved 7/21/24 from : https://www.bart.gov/sites/default/files/docs/BARTFacts2023.pdf

"Displacement and Commuting in the San Francisco Bay Area and Beyond: An Analysis of the Relationship Between the Housing Crisis, Displacement, and Long Commutes" Marlon Boarnet, Seva Rodnyansky, Bonnie Wang, Andre Comandon, METRANS Transportation Center (2023)

Francesca Ortegren, "The Best and Worst Metros for Commuting via Public Transportation", Retrieved 7/21/2024 from : https://listwithclever.com/research/the-best-and-worst-public-transportation/#ek3h3xmq

"GDP of the San Francisco Bay Area in the United States in 2022", Statista, Retrieved 7/30/24 : https://www.statista.com/statistics/5916/gdp-of-the-san-francisco-bay-area-by-industry/

"Gross domestic product (GDP) of China in 2022", Statista, Retrieved 8/19/24 : https://www.statista.com/statistics/278557/gdp-of-china-by-region/

"How Americans View Their Jobs", Pew Research, Washington DC, (2023) https://www.pewresearch.org/social-trends/2023/03/30/how-americans-view-their-jobs/

Jacob L. Wasserman, Brian D. Taylor, State of the BART: Analyzing the Determinants of Bay Area Rapid Transit Use in the 2010s, Transportation Research Part A: Policy and Practice, Volume 172, 2023

“May 2024 Complete Monthly Ridership”, National Transit Database, Retrieved 7/30/24 : https://www.transit.dot.gov/ntd/data-product/monthly-module-adjusted-data-release

“Survey Findings : Demographics”, San Francisco Municipal Transport Agency (2023), Retrieved 7/21/24 from : https://www.sfmta.com/sites/default/files/reports-and-documents/2021/02/survey_findings_demographics.pdf

“The State of Transit Equity: Metro Los Angeles”, TransitCenter (2021) , Retrieved 8/19/24 : https://transitcenter.org/wp-content/uploads/2021/06/LAFactSheet.pdf

Robert Cervero, John Landis, Twenty years of the Bay Area Rapid Transit system: Land use and development impacts, Transportation Research Part A: Policy and Practice, Volume 31, Issue 4, 1997, Pages 309-333

U.S. Census Bureau, "Means of Transportation to Work by Selected Characteristics for Workplace Geography", ACS 1-Year Estimates Subject Tables, Table S0804, 2022, https://data.census.gov/table/ACSDT1Y2022.B08119?t=Commuting&g=050XX00US06075