UC Berkeley

The Influence of Tech Shuttle Stops on Local Rental Listings:

An in depth analysis of SF Craigslist Advertisement**s**

CP 101 Assignment 3

Eva Phillips, Emily Wolfson & Rivka Batlan

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Introduction

On December 9th, 2013 anti-eviction protestors gathered around a Google employee commuter bus headed toward Mountain View with signs saying "Stop Displacement Now" and "Public $$$, Private Gains." According to the SF Chronicle, these tech shuttles are "driving up local rents, gentrifying diverse neighborhoods, undermining public infrastructure, and generally being lame."[1] This news report captures the sentiment that has built up over the past five years as these protests and news stories have frequented SF Bay Area media outlets, becoming a defining narrative of San Francisco. As the city's housing market becomes one of the most expensive in the country, it has seen rising rates of eviction and displacement, as well as a strengthening presence of tech professionals and industry. Many claim this 'tech-fueled' gentrification is a direct result of realtors capitalizing on the booming real estate market and evicting vulnerable tenants. This narrative sets the context for this paper, which takes a closer look into the influence of tech shuttles on San Francisco's local rental market.

In this paper, we are interested in exploring two questions: First, what is the spatial relationship between tech shuttle spots and eviction rates? And second, how do tech shuttle stops influence local Craigslist rental listings? We do not aim to conclude whether tech shuttles are a cause of gentrification, for that analysis is beyond the scope of this project. Rather, we are interested in understanding how the presence of tech commuter shuttles is spatially related to cases of displacement, and how they are changing the way people search for and advertise rental units in San Francisco.

We will explore these questions through a variety of methods and data sources, including a mix of open data and big data, in an attempt to gain a more comprehensive and substantiated view of the intersections between tech shuttles, rental advertisements, and displacement. Before exploring our findings, it is necessary to first establish the background and framework through which we will be approaching this project.

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[1] Oremus and Olmstead, "Protesters Surround Google Bus in San Francisco. Obnoxiousness Ensues."

Background

Tech Shuttles: History and Controversy

When they first began running in the early 2000's, the private commuter shuttles "picked up more than 2,000 employees each day from about 50 points around the city" with no official regulations or oversight by city or regional government. These private shuttles utilized public bus stops, which caused residents to complain that the shuttles were disrupting their built environment. Since then, shuttle provision and ridership has rapidly grown, with more than 8,500 people commuting by shuttle daily in 2016.[2] The San Francisco Municipal Transportation Agency (SFMTA) implemented a formal program in conjunction with the tech companies in 2014, allowing the shuttles to continue using already established public bus stops for a fee of $1 per stop, to cover the cost of permitting and enforcement. The program formalized the relationship between tech buses and government in an attempt to mitigate the organizational problems that ensued from their illegal use. As of 2015, there are 125 SFMTA officially designated stops throughout the city (see Figure 1).[3]

With increased usage came increased backlash from some San Francisco residents and community advocacy organizations. There have been large public and neighborhood concerns regarding the local impacts of the shuttles, from issues of safety and noise pollution to gentrification and displacement. Although there initially was little uprise regarding their presence, the controversy around them peaked in 2013 when headlines such as "How Google's Buses Are Ruining San Francisco" and "Protesters upset by evictions block Apple, Google buses in Bay Area," became commonplace in the media. This is now a narrative Bay Area residents know all too well. For many, the fight against the shuttles is somewhat of a "proxy fight against rising rents and gentrification, as wealthy tech industry types move into some neighborhoods at the expense of current residents."[4]

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[2] Crucchiola, "SF's Tech Bus Problem Isn't About Buses. It's About Housing."

[3] "The Role of Shuttle Services in San Francisco's Transportation System: Final Strategic Analysis Report."

[4] The Times Editorial Board, "San Francisco's Bus Wars Are a Proxy Fight against Gentrification."

Figure 1. SFMTA Tech Shuttle Stops

Source: SFMTA Commuter Shuttle Pilot Network, 2015

Live/Work Commuter Analysis

As previously stated, many running narratives surrounding gentrification and displacement within San Francisco purport that tech workers play an immense role in the changing demographics and forced movement of lower-income city residents. However, very few sources substantiate these claims with actual analyses that provide the scope of how many tech workers live in San Francisco and commute to outside in outside areas.

We sought to gather data around live/work commute patterns from the Longitudinal Employer-Household Dynamics series in the U.S. Census to understand how many Silicon Valley employees commute from San Francisco. First, we needed to define the municipalities that comprised Silicon Valley. To do so, we researched major electronics and tech companies in the San Francisco Bay Area and compiled a list of the most recurring cities. From this research we decided to focus on ten cities as our aggregate Silicon Valley: Cupertino, Los Gatos, Menlo

Park, Milpitas, Mountain View, Palo Alto, Redwood City, San Jose, Santa Clara, and Sunnyvale.

Completing Destination searches for each city reveals that between 2010 and 2014, the number of people living in San Francisco and traveling to the Silicon Valley for employment increased by approximately 10,000. In 2010 a total of 27,029 people reported living in San Francisco and working in one of the ten Silicon Valley cities, while that number had risen to 37,006 by 2014. When looking at these figures as percentages in relation to the total number of workers overall however, they remain relatively low at 3.5% and 4.1% respectively. This is likely because the area overall experienced a 16.1% increase in the number of total jobs between 2010 and 2014. This overall increase has kept the proportion of Tech industry jobs fairly constant over time. In this sense, while the percentage of workers commuting from San Francisco has remained consistent, the actual numbers have increased greatly, which likely indicates an increase in the number of Silicon Valley workers living in San Francisco and occupying more rental units. A study done by the Transportation Research Board found that "without the shuttle service, 40 percent of commuting tech workers in San Francisco would move closer to their offices outside the city,"[5] showing that these commuter shuttles directly influence where tech workers chose to live.

Displacement and No-fault Eviction

Tech buses have come to symbolize the city's narrative of "tech-fueled gentrification, economic inequality and soaring housing prices." [6] While displacement and gentrification are difficult to quantify, many housing advocates and researchers have looked to the rising number of evictions as evidence of this phenomenon. As shown in Figure 2, the number of annual no-fault evictions has increased 344% since 2010, reaching 945 cases in 2016 (SF Rent Board). Community advocacy groups, such as the San Francisco Tenants Union and the Anti-Eviction Mapping Project explain this 'eviction epidemic' as a result of landlords seeking opportunities to capitalize on economic booms by evicting tenants, flipping their units and selling to developers for high-end rental or condo conversion.[7]

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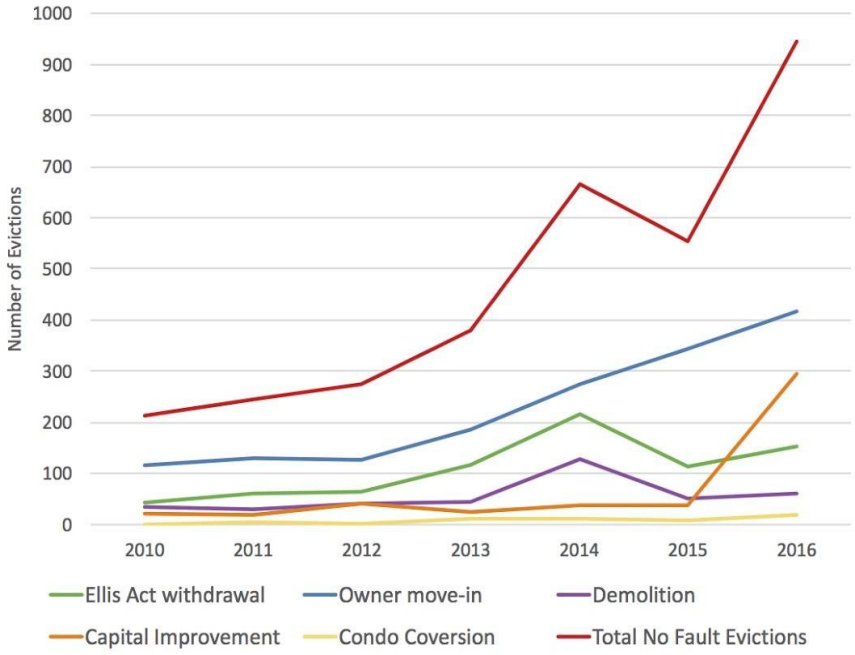
[5] McElroy, "San Francisco Tech Bus Stops, Displacement, and Architectures of Racial Capitalism | ARCADE | Dialogue on Design."
[6] Oremus and Olmstead, "Protesters Surround Google Bus in San Francisco. Obnoxiousness Ensues."
[7] Bowe and Tokar, "Out of Place | Tenants Together."

Figure 2. Change in No-Fault Evictions by Type, 2010-16



Source: San Francisco County Rent Board Annual Eviction Reports, 2010-16

Part 1: Spatial Relationships between Evictions and Tech Stops

The above phenomenon has been analyzed and mapped by various research groups; however, what this paper will aim to do is substantiate the actual scale of this issue in comparison to other forms of commuter transit, as well as understand the ways in which tech shuttle stops are influencing local rental listings and advertisements. Through a spatial analysis of no-fault evictions, tech shuttle stops, and SF Bay Area Craigslist data, we hope to put some numbers to this narrative.

Data

We used open data on eviction from the SF Rent Board's Annual Eviction Reports to analyze the spatial relationship between tech shuttle stops and displacement. In order to decide the time range of evictions to focus on, we searched google news in yearly increments from 2000-2017 using the search terms "San Francisco" and "google bus" to see when the controversy of tech shuttle stops and displacement gained media attention. We found no stories related to this controversy until the year 2013 when our search results flooded with headlines about protest and

uprising against the shuttles. Knowing that stories discussing protests around tech shuttles began picking in 2013, we decided to look at evictions from 2010-2016 to make sure we are only looking at evictions which are temporally relevant to this controversy.

Additionally, we selected for no-fault evictions (owner move in, ellis act, remodel, demolition, and condo conversion) since these are the cases that imply eviction due to potential market pressures. It is important to note, however, that these evictions reports are not comprehensive of all evictions in the city. Many evictions cases do not go through the full legal process but rather result from landlord intimidation or end in pay-outs rather than proper evictions, and are not captured in the city's rent report.[8] With this in mind, we assume our findings would be more extreme if evictions were better reported.

As noted earlier, the locations of the shuttle stops are from SFMTA open data 2015 list of recognized stop locations. However, this information is not regularly updated nor is it in easily usable and accessible formats. In order to use the data, we had to manually geocode the address from a list of unclear intersections. The locations of Bart and Caltrain stops came as shapefiles from CalTrans' GIS portal.

Methodology

In order to determine whether there is a significant spatial correlation between no-fault evictions and tech shuttle stops, we conducted a comparative analysis between the number of evictions near shuttle stops and other public transit stops. With the knowledge that proximity to transit stops generally increases the desirability of nearby housing units, we chose to analyze eviction trends near commuter rails Bart and Caltrain in comparison to tech shuttle stops. In order to assess the impact tech shuttle stops are having on eviction rates we felt it was important to compare their distribution to that of other forms of commuter transit to see if it is significantly different.

For our spatial analysis, we chose to define 'proximity to the stops' as .25 miles because it is considered the average comfortable walking distance, meaning it is also the convenient distance to live from a commute transit stop. Using ArcGIS we created a .25 buffer around Bart

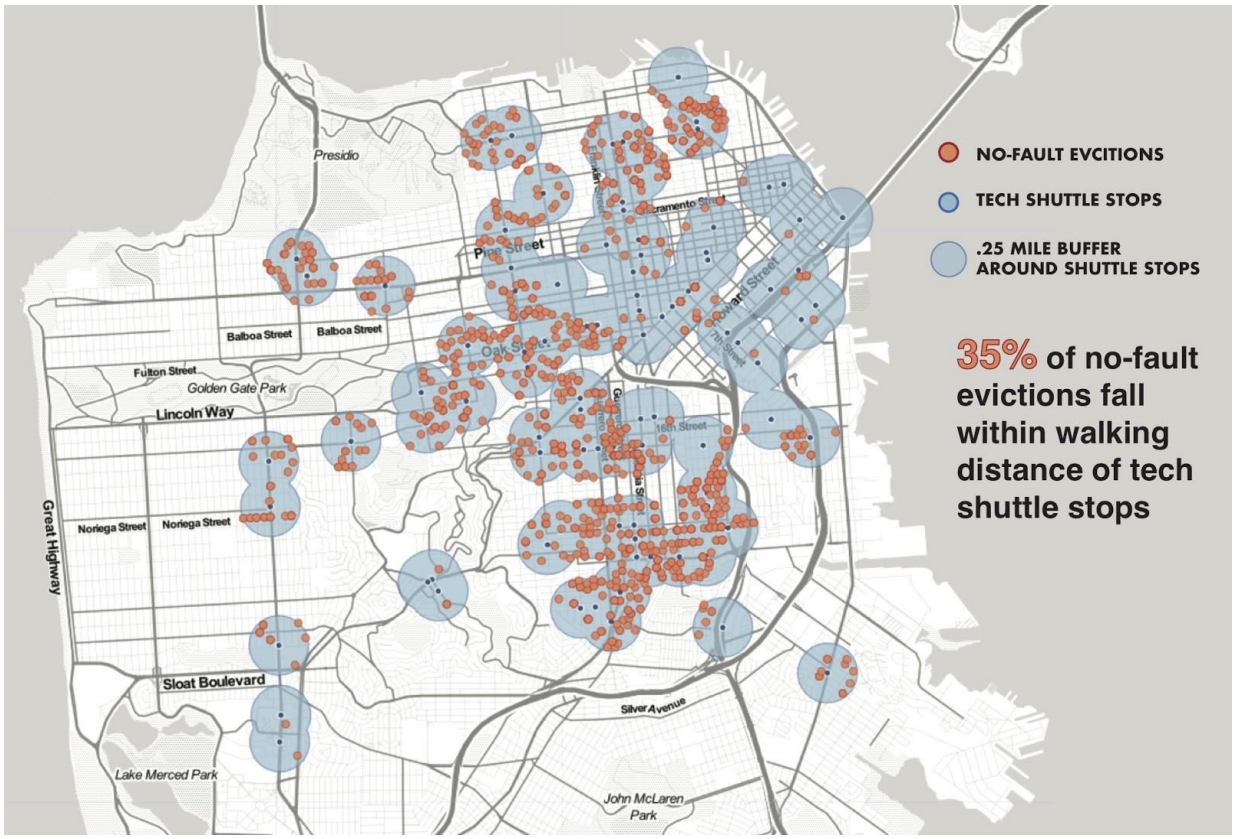
[8] "Condo & TIC Conversions – San Francisco Tenants Union."

and Caltrain stations. We then conducted a spatial join between the buffer and no-fault evictions to find the count, mean, and standard deviation of evictions per station. This served as a baseline to compare to the distribution of evictions near tech shuttle stops. We then replicated the same process for the tech shuttle stops and mapped the resulting shapefiles in CartoDB.

Findings

After conducting the spatial analysis, we found that the average number of evictions near tech shuttle stops is higher than that of Bart and Caltrain stations. As shown in the map in Figure 3, 1171 no-fault evictions (35%) fall within walking distance of a tech shuttle stop. The average number per tech shuttle stop is 40.7 evictions with a standard deviation of 72. Meanwhile, as the map in Figure 4 shows, 571 evictions (17.4%) fall within walking distance of Bart and Caltrain stops. The average number of evictions for Caltrain and Bart stations is 38 with a standard deviation of 107.65.

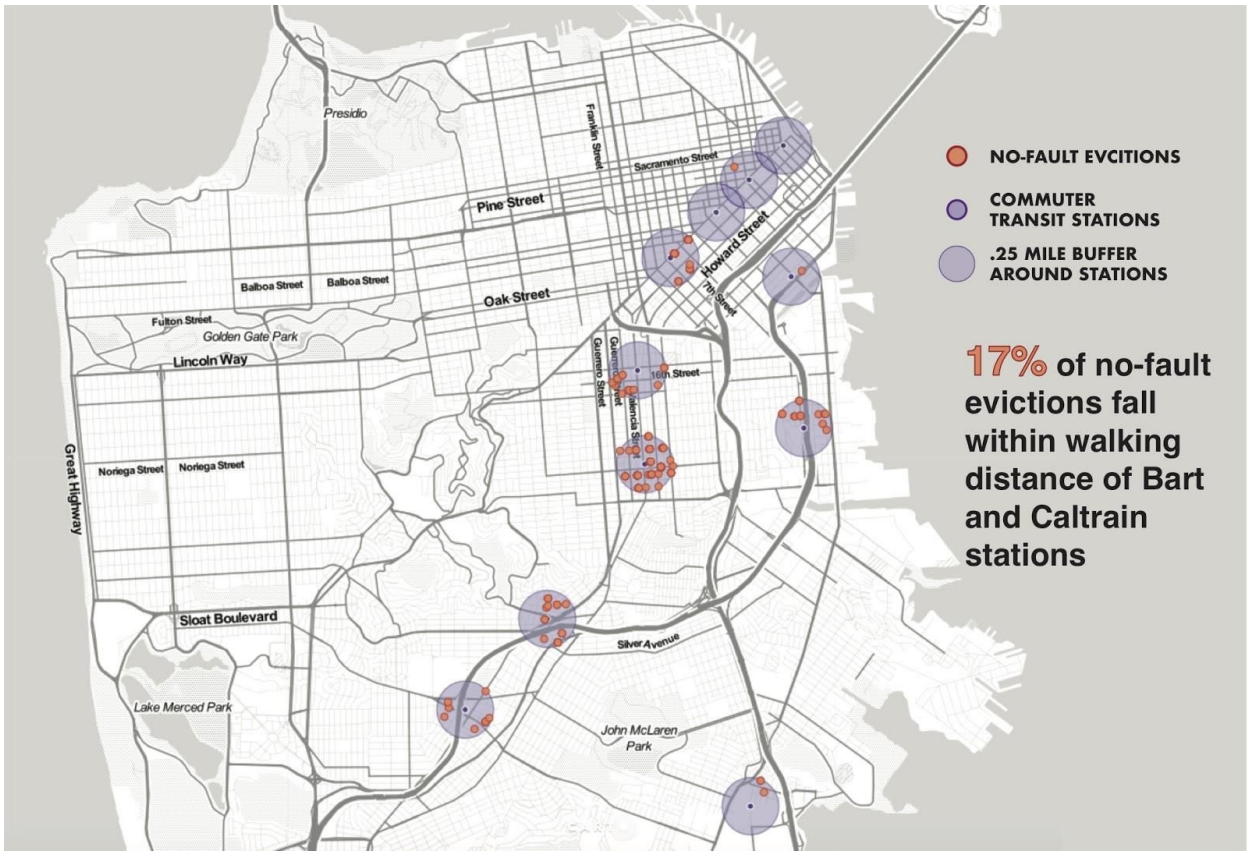
Figure 3. No-Fault Evictions Near Tech Shuttle Stops



Source: SF Rent Board 2010-16, SFMTA

There are far fewer Bart and Caltrain stops compared to tech shuttle stops and because Bart stations on Market street fall within primarily commercial rather than residential areas, the resulting data distribution was skewed. The 24th and Mission Station held 435 of the 571 evictions near Bart and Caltrain, creating a large standard deviation. While we could not properly compare the significance or variance between public transportation and tech stops in the way we had hoped, we can still see that the mean number of evictions near tech shuttle stops is higher than that of Bart and Caltrain stations. This is important because while tech shuttle stops act as another form of commuter transit, they have very different spatial relationships with eviction and displacement when compared to Bart and Caltrain. While we cannot point to causation due to confounding variables and a limited analysis, we can see that tech shuttle stops are spatially associated with eviction in a much stronger way than other forms of commuter transit.

Figure 4. No-Fault Evictions Near Commuter Transit Stations



Source: SF Rent Board 2010-16, SFMTA, CalTrans

Part 2: Tech Stops and Rental Listings

In working to understand the ways in which Craigslist users are using proximity to tech shuttles to advertise their units, we wanted to answer several questions. First, what do these listings look like in terms of prices and composition, and how does this compare to listings as a whole? Second, we wanted to know who was creating the posts. This helps us understand how the knowledge of these stops is being communicated, as a listing created by a tech worker looking for a roommate tells us something very different than a realtor trying to attract tech workers for tenants. Lastly, we were interested in whether the tech shuttle stops are a key element in the listing, or simply mentioned on a list of nearby transit options along with Bart and Muni.

Data

Our primary method of data collection was web-scraping Craigslist to gather information on rental prices and advertisements. We were interested in examining the rental market (rather than the market for home sales) because census homeownership rates shows that renting is more common than owning both among low-income people and millennials, including young tech workers. This makes the rental market where displacement is of most concern.

In the Bay Area, Craigslist is a ubiquitous method for apartment hunting and advertising, meaning it provides more real-time, granular data on rental listings than the the US Census and the ACS can provide. This level of data was essential for our analysis since the presence of tech shuttle stops is fairly new and may not be captured in five or ten year surveys. Additionally, Craigslist's common use, particularly by young people, can give us insight into the culture and methods around apartment advertising and hunting.

In order to contextualize the rental prices from Craigslist and get a sense of how high the rates were, we compared the craigslist rental prices to the fair market rates for San Francisco. Fair Market Rates, as determined by the Department of Housing and Urban Development, dictate the fair rental rate for units of one, two, three, or four bedrooms. The rates, which are specific to each county in the United States, are calculated using data from the ACS, decennial Census, and Random Digit Dialing survey.

Methodology

After much trial and error, we decided the best method was to scrape all our data in one day, selecting for all "listings posted within the past 30 days." This way, we were able to get a snapshot of the Craigslist rental market within the month of April. We narrowed our search to only include units in San Francisco and only "rentals and housing" to avoid getting listings for office and work spaces.

Using the online software import.io, we first scraped all the listings for the city with no specific search or selection in order to capture the full picture of rental listings, throughout this report we will refer to this data set as "Total Listings". Then, to capture all the listings which advertise proximity to tech shuttle stops, we used the search queries "tech bus," "shuttle,"

"google bus," and "facebook bus," and scraped and aggregated the results into one data set, which we will refer to as "Tech Listings." We selected these terms from a large list because they generated the most frequent results and seemed to be the most common ways users referred to the tech shuttle stops. When conducting the scrapes, we made sure to retrieve key pieces of information including the listing title, price, full description, number of bedrooms, address, and neighborhood.

When cleaning this data, we removed all duplicate listings and outliers (such as listings located outside San Francisco or units for sale rather than rent). Additionally, since we are interested in analyzing these listings spatially, we removed listings that did not include a spatial component of either and address or neighborhood.

Findings:

Overall, 13% of the total 2,407 listings advertised proximity to tech shuttle stops. Of these listings, 44% were one bedrooms, 35% were two bedrooms, and 18% were three bedroom apartments. Figure 5 shows the five neighborhoods with the highest concentrations of tech listings, many of which, such as the Mission District and SOMA, are facing current pressures of gentrification and displacement.

Figure 5. Top Five Neighborhoods for Craigslist Tech Listings

Neighborhood	# of Listings	% of Total Listings
Noe Valley	37	12%
Mission District	33	10%
Pacific Heights	30	9%
Marina / Cow Hollow	30	9%
SOMA / South Beach	25	8%
Total	321	

Source: Craigslist, April 2017

Note: This chart only includes the top five of the total 36 neighborhoods included in the data

Of the keywords we searched, “shuttle” was by far the most common way people referred to the tech commuter shuttles, comprising 88% of our search results (see figure 6). These results were surprising to us in that “Google bus” is often the dominant name heard throughout tech and gentrification narratives, while our research shows that only 5% of postings explicitly named them. When considering advertising strategies, this may be an indication that realtors and other posters are not necessarily concerned with the recognition value that Google or other specific companies bring.

Figure 6: Frequency of Search Terms Used

	Count	Percent
Shuttle	299	88.5%
Tech Bus	17	5.0%
Google Bus	16	4.7%
Apple Bus	4	1.2%
Facebook Bus	2	0.6%
Total	338	100%

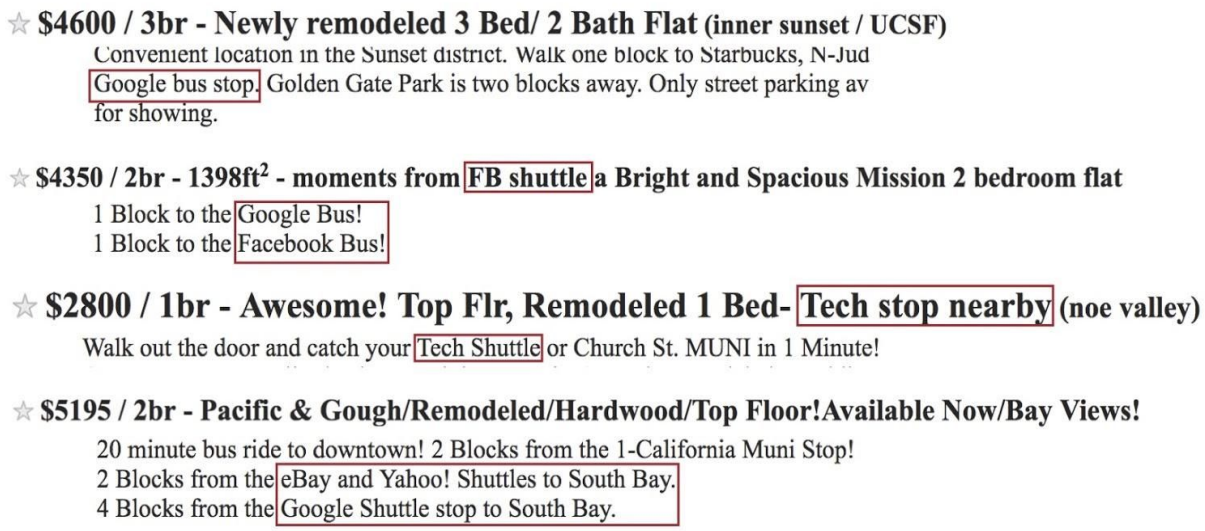
Source: Craigslist, April 2017

Of these listings, we were interested to see the various ways people mentioned tech shuttles in their advertisements and what that implies about their intentions and strategies. Through our research, we recognized that a post highlighting proximity to tech shuttle stops in the title serves a different purpose and audience than one including tech shuttle stops within a broader list of nearby transit options. As seen in Figure 7, users mention tech shuttle stops in different ways. Knowing this, we wanted to differentiate between listings actively advertising towards tech workers and those communicating tech shuttle stops simply as another form of commuter transit.

Through a filtering process, we found that only 16 listings (5%) directly advertised tech shuttle stops in the title. Meanwhile, 285 listings (88.8%) mentioned both tech shuttle stops and Bart or Muni in the description, while only 11.2% mentioned tech shuttle stops without including

other transit options. From this we can conclude that the vast majority of listings that advertise proximity to tech shuttle stops are simply listing them as a nearby form of transit. This shows that most users are not necessarily gearing their listings towards advertising to tech workers.

Figure 7. Example Listings Advertising Proximity to Tech Shuttle



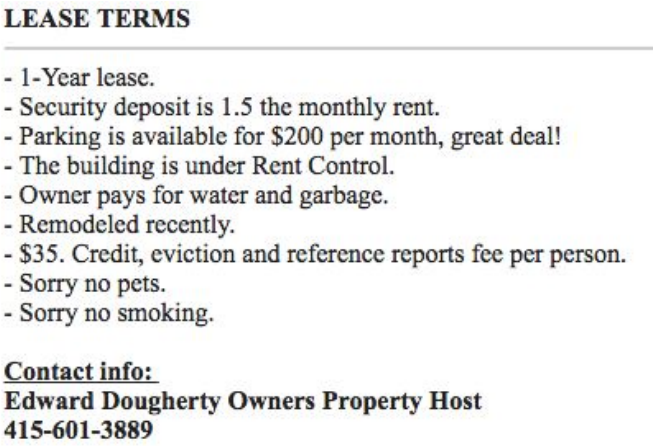
Source: Craigslist, April 2017

In addition to exploring how tech shuttle stops are used within listings, another key component is who is creating these listings and taking advantage of their presence. This is highly tied to ideas within gentrification narratives that realtors are taking advantage of the economic boom and influx of tech workers, flipping units and profiting off the displacement of lower-income tenants. Manually combing through the description of each post advertising tech shuttles, we subjectively discerned whether postings were created by the unit's owner, the building's property manager/company, a realtor, or a roommate. This is significant because it is likely that units managed directly by owners, particularly those not associated with a property agency, incur fewer costs and barriers to potential renters. For instance, the realtor and property manager postings in our scrape were more likely to ask for proof of income, a specific credit score, realtor's fees, or report fees, as shown in Figure 8. This is important when considering accessibility for lower-income or less established renters, as well as the audience that posters are

directing their ads to.

From a total of 322 listings that advertised tech buses in some manner, 163 of them were explicitly posted by a realtor or listing agents, 11 were posted by property managers, 8 by roommates, and 132 were unspecified. Unspecified postings were those that included contact information without explicitly giving the role of the person; typically just a name and phone number were included. It is entirely possible that some of those unspecified posters could be realtors or property managers, as many included language that was similar to those posted by realtors. However, since it is not possible to decipher, we decided not to make assumptions. Even when considering the large amount of unspecified posts, more than half of the posts were explicitly posted by realtors. This may indicate that realtors have tapped into the appeal of tech bus stops and are using them as a focus in their advertisements, in order to attract a certain population of renters.

Figure 8. Realtor Listing Example



LEASE TERMS

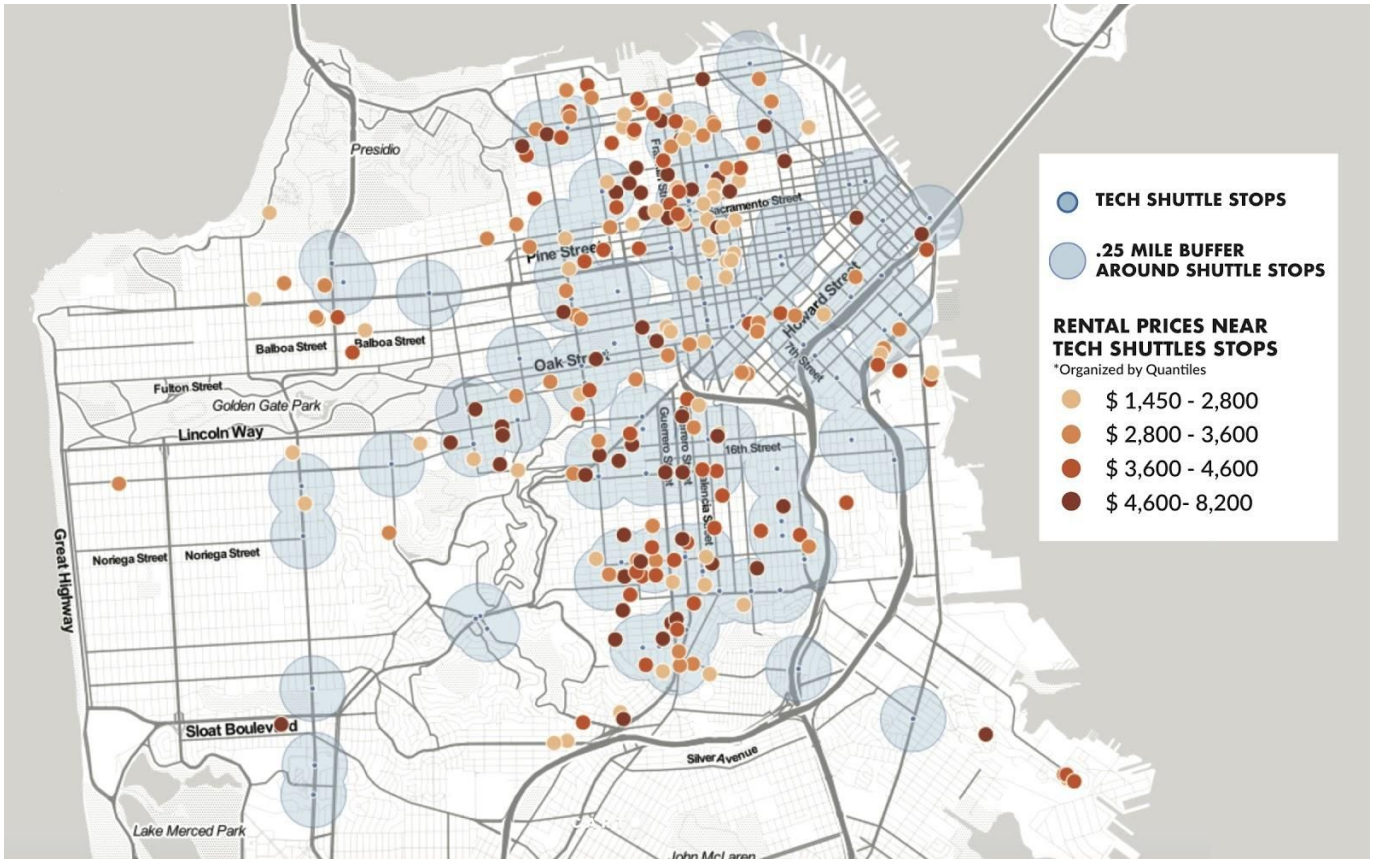
- 1-Year lease.
- Security deposit is 1.5 the monthly rent.
- Parking is available for $200 per month, great deal!
- The building is under Rent Control.
- Owner pays for water and garbage.
- Remodeled recently.
- $35. Credit, eviction and reference reports fee per person.
- Sorry no pets.
- Sorry no smoking.

Contact info:
Edward Dougherty Owners Property Host
415-601-3889

Source: Craigslist, April 2017

In examining the tech listings, we found that rental prices are generally high across San Francisco as whole. As mapped in Figure 9, we can distinguish some groupings, particularly in the Mission District and Franklin street, where several listings are highly priced between $4,600 and $8,200. On the other end of the spectrum, around Sacramento Street the listings are priced on the lower end, between $1,450 and $2,800.

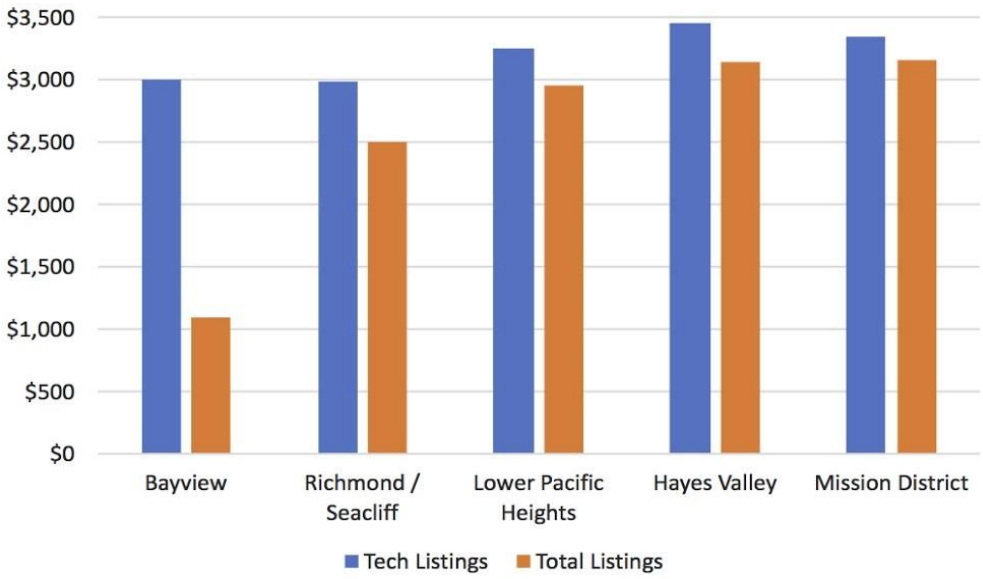
Figure 9. Craigslist Listings Advertising Proximity to Tech Shuttles, by Rental Price



Source: Craigslist, April 2017

In comparison to the total listings from our Craigslist scrapes, the tech listings are consistently more expensive. As seen in Figure 10 below, which shows a sample of the neighborhoods in San Francisco, the tech listings from our scrapes are, on average, more highly priced than their total listing counterparts. On average, the discrepancy in rent between tech listings and total listings is $192. Although the tech listings on average are only slightly higher than the total listings, the price difference is still worth recognizing. The tech listings, as we hypothesized, are in fact more expensive than the other units we examined in our craigslist scrape.

Figure 10. Average 1 Bedroom Rent by Neighborhood



Source: Craigslist, April 2017

Furthermore, when we compare the tech listing prices to the Fair Market Rate defined by HUD for units in San Francisco, we find that the vast majority of tech listing rental prices are not considered "fair" in the current market. Of all of our tech listings that were four bedrooms or less, only four listings were priced at or below the fair market rate (FMR). Additionally, a higher percentage of tech listings when compared to total listings are priced above the fair market rate, 98% of the 1 bedroom tech listings are considered "unfair," only 92% of total listings are unfair (see Figure 11).

Figure 11. Percent of Listings that Fall Above the Fair Market Rate

Bedroom FMR	% Tech Listings Above	% Total Listings Above
1 Bedroom ($2,411)	98%	92%
2 Bedroom ($3,018)	100%	97%
3 Bedroom ($3,927)	98%	97%
4 Bedroom ($4, 829)	88%	84%

Source: HUD Fair Market Rate Reports

Limitations

Throughout this process we were met with several challenges in relation to our data, as well as our general capacity and ability to meet our initial goals. In many ways the first issues we experienced were surrounding data accessibility, a topic that has become central to guiding the methods and deliverables for this project. Due to issues of privacy within the private tech companies, as well as the controversy surrounding tech buses in general, there exists a lack of transparency around both the history and current state of tech shuttle stops within San Francisco. For instance, there is a lack of detailed and formal history about the rise of tech buses, and more specifically the relationship between private companies and public entities. While it is clear that there is a partnership between SFMTA and tech companies in Silicon Valley, the details of the program, including its history and logistics, are kept obscured. This made it extraordinarily difficult to find accurate and updated information about shuttle stop locations, leading us to find alternate sources and methods for mapping.

Other limitations came both from the data we were able to gather as well as our capacity to analyze it. The craigslist scrapes had a number of inaccuracies, such as price differences between the titles and within the postings, as well as misleading advertisements that made it difficult to determine listing characteristics such as whether a room was actually a one-bedroom studio apartment or one bedroom within a shared apartment. Due to the scope of the data, over 2,400 total listings, it was beyond our capabilities to manually sort through and clean the posts. Ideally we would have been able to not only clean the data in this way, but also analyze the total listings dataset similarly to the analyses we were able to do for the tech listings. For instance, while we were able to perform a qualitative analysis of the post writer (realtor, unit owner, etc.) for the tech listings, that same analysis was beyond our capacity for a dataset the size of the total listings.

Beyond the technical issues our data presented, perhaps some of the most limiting aspects of our research were the confounding variables present in our analyses, which made drawing conclusions nearly impossible. Particularly as it concerns eviction data, it is not feasible to make solid, causal connections between tech shuttle stops and eviction rates, as there are a number of confounding factors that are likely influencing these high rates, including but not limited to high

appeal of particular neighborhoods as well as already ongoing gentrification. In this sense, while we were able to visually map the spatial relationship between evictions as they relate to tech shuttle stop locations, we are not able to draw conclusions about that relationship past its spatial association.

Implications

SFMTA has the unique opportunity, as the governmental body that already has regulatory oversight over the tech buses, to further regulate the tech bus presence in San Francisco. By continuing to develop the program in collaboration with large tech companies, SFMTA would be able to more closely monitor and evaluate the shuttle services. In order to minimize the negative influence on the built environment, the shuttles could be banned from using smaller residential roads. Additionally, the shuttle services could be consolidated so that tech companies shared their buses. The San Francisco County Transportation Authority has proposed this change because they believe that some existing shuttles are underutilized or redundant. By reducing and concentrating the number of shuttle spots in the city, the effects of the buses on the built environment, and on the community, would be lessened.[9]

In addition to the effect on the built environment, the direct negative impact of the tech buses on the local community may also be addressed through the SFMTA partners program by increasing the usage fees tech companies pay. Currently, the shuttles must pay $1 for every use of the public bus stops, an amount that only accounts for the direct costs to run SFMTA's program that permits and oversees the shuttles. The Anti-Eviction Mapping project proposes that the costs that tech companies pay to use the shuttle should be increased to include the social costs to the community. If, for example, the tech companies paid a fee that was comparable to the cost of a round-trip Caltrain ride to Mountain View ($14.50 per rider), such a program would raise $65 million per year.[10] These funds could go directly toward funding affordable housing initiatives. Although private companies would be reluctant to pay such costs, they undoubtedly have the means to do so and such a program would mollify the issue significantly.

As for the issue of transparency and accessibility that we've come across through our

[9] Levi, "S.F.'s 'Google Bus' Program Making Progress, Report Says."
[10] Stoltzfus, "A $65 Million Idea to Ease the Tech Bus Controversy."

research for this project, private companies should be held more accountable by local advocates and community members in their actions, especially in their deals with public organizations and governmental bodies. Activists from community groups like the Anti-Eviction Mapping Project are already fighting to pressure private companies to make their inner workings more public, but this is not enough. There must be initiative from the private companies themselves to actively introduce programs that are clear and transparent to their consumer base. There is not only an ethical incentive to do so, but an economic one as well. It would serve the profits of large tech companies to integrate themselves into the acceptance of local communities to the best of their abilities.

Open data portals are becoming increasingly more relevant, and more resources should be devoted to local branches of government to increase the data sets that are available on these pre-existing platforms. In order ensure that the policies that are being implicated are actually desirable and helpful to the people who will be most affected, community members must be included into the decision-making process. An issue that cannot be resolved with technical adjustments, but with systemic changes, demands input from community groups. Local advocacy organizations, people of color, environmental watchdogs, and disenfranchised minorities should be included in addressing the tech bus takeover.

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