Title
Assessing Public Outreach about Slow Streets in San Francisco

Author
Rogow, Lena

Publication Date
2021-06-01

DOI
10.17610/T6CW26

CAPSTONE PROJECT REPORT

UCLA Institute of Transportation Studies

Assessing Public Outreach about Slow Streets in San Francisco

Project Lead: Lena Rogow
Faculty Advisor: Anastasia Loukaitou-Sideris
Client: San Francisco Municipal Transportation Agency (SFMTA)

June 2021

Technical Report Documentation Page

1. Report No. N/A	**2. Government Accession No.** N/A	**3. Recipient's Catalog No.** N/A
4. Title and Subtitle Assessing Public Outreach about Slow Streets in San Francisco		**5. Report Date** 2021 **6. Performing Organization Code** UCLA-ITS
7. Author(s) Lena Rogow		**8. Performing Organization Report No.** LAS2026
9. Performing Organization Name and Address Institute of Transportation Studies, UCLA 3320 Public Affairs Building Los Angeles, CA 90095-1656		**10. Work Unit No.** N/A **11. Contract or Grant No.**
12. Sponsoring Agency Name and Address UCLA Institute of Transportation Studies www.its.ucla.edu		**13. Type of Report and Period Covered** Final **14. Sponsoring Agency Code** UC ITS

15. Supplementary Notes
DOI: 10.17610/T6CW26

16. Abstract

In April 2020, one month into COVID-19 lockdown, the San Francisco Municipal Transportation Agency (SFMTA) announced its new Slow Streets program. This emergency response closed select city streets to thru traffic, providing more space to physically distance for those who want to travel by foot, bike, wheelchair and other modes. Moving forward, the city now has to decide how to build a Slow Streets program that will be sustainable in the long term. To help with this plan, SFMTA issued a public questionnaire that asks where respondents live, what their opinion is of Slow Streets and if they recommend certain corridors for future Slow Streets. This capstone project set out to analyze citizen responses to interpret the project's effectiveness in communicating to San Francisco residents. Relying primarily on a spatial analysis of questionnaire responses and a qualitative analysis of one-off emails about the program, I examined whether citizens liked and understood the program, and how far-reaching the city's outreach had extended. I found that many citizens believed the Slow Streets program was for commercial corridors, rather than residential, which is part of the program's criteria. I also found that responses were absent from neighborhoods with large percentages of low-income populations and high representation of communities of color. Based on these findings, I recommend that SFMTA adjust its messaging to communicate about the residential land use designation of the Slow Streets corridors. I also recommend that the city prioritize future outreach in areas of the city that were not well-represented in the original questionnaire.

17. Key Words bicycle planning, pedestrian planning, Bay Area, California, equity	**18. Distribution Statement** No restrictions.

19. Security Classif. (of this report) Unclassified	**20. Security Classif. (of this page)** Unclassified	**21. No. of Pages** 67	**22. Price** N/A

Assessing Public Outreach about Slow Streets in San Francisco

By Lena Rogow

University of California, Los Angeles
Meyer and Renee Luskin School of Public Affairs
Department of Urban Planning

Faculty Advisor: Anastasia Loukaitou-Sideris
Client: San Francisco Municipal Transportation Agency (SFMTA)
June 1, 2021

A comprehensive project submitted in partial satisfaction of the requirements for the degree of Master of Urban and Regional Planning

Table of Contents

List of Tables

List of Figures

Acknowledgments

The Institute of Transportation Studies at UCLA acknowledges the Gabrielino/Tongva peoples as the traditional land caretakers of Tovaangar (the Los Angeles basin and So. Channel Islands). As a land grant institution, we pay our respects to the Honuukvetam (Ancestors), ‘Ahiihirom (Elders) and ‘Eyoohiinkem (our relatives/relations) past, present and emerging.

This capstone has been an ongoing labor of love since I firmly decided that I wanted to do a project about San Francisco Slow Streets. I am very fortunate to have had support from the start from my advisor, Professor Anastasia Loukaitou-Sideris. Her timely and thoughtful feedback, as well as her advice in navigating challenging moments, made this process much less stressful. I am also grateful for Brain Liang at SFMTA, who cared deeply about the outcome of the project and was willing to help me answer any and all questions.

A number of other people were also integral in helping to bring this project to life. I am forever in debt to the data wizardry of Eric Dasmalchi. I am also grateful for guidance from Professor Nina Flores, Professor Adam Millard-Ball, and Juan Matute. Thank you, Shannon Hake at SFMTA, for figuring out how I could do my capstone with your team. Thank you as well to Isabel Cárdenas, Sam Speroni, Asiya Patel, Jan Yonan, and Maddie Garces.

Finally, thank you to all my family and friends who believed in me when I declared I was going back to school to “study trains.” A special thanks to Diana Guyton-Sans who volunteered to spend a Saturday helping me design tables and choose fonts. And, of course, I wouldn’t be writing this report today without Daniel Joseph, who has always believed I have something more to say.

Disclaimer

This report was prepared in partial fulfillment of the requirements for the Master in Urban and Regional Planning degree in the Department of Urban Planning at the University of California, Los Angeles. It was prepared at the direction of the Department and of SFMTA as a planning client. The views expressed herein are those of the authors and not necessarily those of the Department, the UCLA Luskin School of Public Affairs, UCLA as a whole, or the Client.

This project received funding from the UCLA Institute of Transportation Studies and the Federal Highway Administration through the Dwight D. Eisenhower Transportation Fellowship.

Positionality

I would be remiss if I did not begin a capstone about public outreach without identifying where I come from and my limitations in discussing this topic. I am a native San Franciscan, so discussing the pros and cons of converting corridors as potential Slow Streets came naturally to me. I've lived in the city both as an adult and as a child; I've taken public transit through it, biked through it, walked through it, and driven through it. These experiences allow me to understand how many San Franciscans access space and get around in their city.

However, I am a White San Franciscan, which limits my abilities to identify how communities of color experience the city. Later on in my capstone, I mention that the zip codes most represented in the SFMTA questionnaire were 94110 and 94117. I grew up in 94110 and lived in 94117 as an adult. After finding that these zip codes were heavily overrepresented in the survey, I could not help but feel that the Slow Streets program was planned *for* someone like me: a White, able-bodied woman with the resources, time and privilege to choose where and when I travel and can move freely and safely through a street at my own leisure. As the demographics of the city have shifted, San Francisco has also seen an increase in people like me, who are young and White (Yollin, 2015).

In this capstone, I seek to identify ways that SFMTA can plan *with* communities in the city who have less privilege, and who may not feel safe walking through their streets, or who may not have the time to bike or walk to a destination. I discuss how communities of color and low-income communities are not well-represented in previous Slow Streets public outreach efforts by the city. I hope that the city recognizes the need to bring these communities into its planning processes moving forward so that it can come closer to equitable city planning.

This capstone makes recommendations for increasing engagement with marginalized communities. However, I am not the final word on this topic, nor should I be. My hope is that this capstone demonstrates the need for the city to decenter the historical predominance of White voices in its outreach. Instead, those who live in each neighborhood in the city and have the lived experiences of moving around their communities should have the ultimate say as to how the city creates a safe and livable space for their mobility needs.

Executive Summary

In March 2020, cities across the United States shut down in response to the COVID-19 pandemic. With decreased commuting numbers, travel patterns began to change and bicycling and walking rose in popularity (Goetsch & Quiros, 2020). In order to accommodate the rising demand to roam freely in outdoor space, many municipalities began to close streets to thru traffic. In April, 2020 the city of San Francisco created its own program called Slow Streets eventually designating 24 corridors to accommodate those traveling without vehicles (Rudick, 2020c).

In order to gauge the public's perceptions and offer residents a tool to provide feedback on their thoughts about the program, the San Francisco Municipal Transportation Agency (SFMTA) issued an online questionnaire for San Francisco citizens. The city received over 6000 responses during a six-month period in addition to over 1000 one-off emails with comments about the Slow Streets program. This capstone study examined these two data sources to answer the following questions:

- What are San Franciscans' perceptions of the Slow Streets program?
- Do they understand the function of the program and do their suggestions fit the program scope?
- How are citizen responses different based on the socio-demographic characteristics of the neighborhoods they live in?

Within the questionnaire, I primarily focused on citizen recommendations to determine if their suggestions for Slow Streets fit SFMTA's criteria for the program. I began by extracting all the responses that were legitimate recommendations—as opposed to blank responses or random comments—which amounted to 4000 usable responses, and then pulled a random sample of 150 responses (about 4%). This was an appropriate sample size to still extract generalizable conclusions about the responses. When comparing these recommendations to the criteria, I was able to develop a better idea of where citizens did not understand the program's function, and, thus, how SFMTA can adjust its outreach and communication. To carry out this analysis, I relied primarily on spatial analyses through hand drawing the recommendations on ArcGIS maps and overlaying the corridors on secondary data.

In order to analyze the research question about socio-demographic patterns, I continued my spatial analyses and analyzed the recommendations as well as the

zip codes in which respondents reported residing. To quantify the analysis of zip codes, I used a spatial join in Python to calculate the number of recommendations in each zip code in the city. I also examined the significance of the over- or underrepresentation of certain geographic areas through median household income and racial analyses based on census data. From there, I was able to determine the neighborhoods from which SFMTA had not heard as many voices about Slow Streets and their populations, as a result, were not as represented in the responses.

In my third type of analysis, I set out to examine the specific perceptions citizens have of the program and analyzed the emails SFMTA had directly received that dealt with Slow Streets. I pulled a sample of 141 email responses (about 10%) and categorized each email based on a set of categories provided by SFMTA. I then organized each category into a percentage of the total sample to determine which categories were most prevalent in the emails. From there, I was able to determine what the sample of San Franciscans cared most about and what concerns were most prevalent. This information provides detail about which specific traits of the Slow Streets program swayed San Franciscans to support or oppose it.

Through the spatial analysis, I found that respondents of the survey were most confused about the zoning function of the Slow Streets corridors. All of the implemented Slow Streets are on residential corridors, as the primary purpose of the program is to provide space for getting from place to place. However, many of the citizen recommendations were within commercial areas—like Downtown San Francisco—or along the main commercial corridors in residential neighborhoods. Some of the recommendations also overlapped with public transit routes—Slow Streets should not be on transit routes—but most of these routes were also commercial corridors. Therefore, this finding demonstrates that SFMTA's messaging about the function of the program has not entirely reached San Franciscans, particularly with regards to the type of corridor that is appropriate for the program.

In addition, in the zip code analysis, I found that responses were largely concentrated in the center of the city, and featured representation from most areas of the city, with the exception of the southern region of San Francisco. When exploring the socio-demographic traits of the areas, I found that all areas with representation of recommendations were from zip codes that had large percentages of White populations. The areas that were most represented were largely mixed-race—White and either Black or Hispanic/Latino—and mixed-income. However, the wealthiest areas of the city were also largely represented in the recommendations. The most noteworthy component of the

socio-demographic analysis was that the southern area of the city, which was largely absent from zip codes and recommendations, is the only area of the city with a small percentage of White people and is mostly made up of communities of color. Through this finding, I showed that SFMTA is largely missing voices from areas of the city with large representation of communities of color and low-income populations.

Finally, in the email analysis, I was able to pull the most important themes from proactive citizen complaints and requests. Even though most of the emails were complaints, only a minority (24%) were complaints that dealt with opposition to the program. This percentage is close to SFMTA's assessment that 80% of the city is in support of Slow Streets (Barnett, 2020b). The remaining critical emails were in support of the program but wanted to see changes based on specific concerns. Among these, I found that 20% of the emails were in support of the program, but asked that it extends to other neighborhoods with less wealthy or privileged populations. In addition, 23% of the emails were about traffic safety, many of which also asked for more signage. This analysis demonstrates that those with adamant opinions about Slow Streets are largely in favor of the program, but want to see it extend across the city and ask for improved traffic safety through signage or other traffic calming devices.

Based on these analyses, I recommend that SFMTA:

1. **Fine tune its messaging to explain the residential function of the program.**

   Many recommendations viewed Slow Streets as primarily for commercial corridors. Given that the program is primarily about mobility and not commerce or dining, the city should highlight and emphasize this function in its outreach. Future messaging should underscore this distinction above other criteria like public transit routes.

2. **Respond to a citizen desire for better traffic safety by adding signage and other traffic calming measures.**

   One of the most pronounced categories in the emails was traffic safety, which was often coupled with a report of missing signage. Many San Franciscans enjoy the Slow Streets program, but would like to see better control of traffic speeds along the corridors so that pedestrians and cyclists can move more safely. In order to accommodate these needs, the city should install more permanent signage at every intersection where a

Slow Street begins. As the program becomes more permanent, the city can install more long-term traffic calming measures.

3. **Prioritize future outreach to communities most absent in the original survey.**

   The survey left out large swaths of the population in largely low-income neighborhoods with high percentages of communities of color. In the next phases of the program, the city should prioritize not only reaching out to these neighborhoods, but specifically involving neighborhood groups that work with people of color. SFMTA has already identified many neighborhoods in this area for its future outreach. However, it has said that it will focus on how to work with the neighborhoods to bring Slow Streets to the communities. I suggest that, instead, the city collaborates more closely with these neighborhoods and community groups at the center of the neighborhoods to find out what their health, mobility and safety needs are on their streets during the pandemic and beyond.

Introduction

In March 2020, cities across the United States shut down in response to the COVID-19 pandemic. Commuting and public transit usage dropped significantly (Curry, 2020) and vehicular traffic decreased dramatically on city streets. However, as a replacement to previous modes of travel, cities saw an increase in bicycling and walking (Goetsch & Quiros, 2020). Almost overnight, cities repurposed many of their streets to make way for micro mobility (use of small and slow vehicles like bikes or scooters), outdoor dining and small gatherings. In April, Oakland, California paved the way in the country as the first city to launch a full Slow Streets network (Bliss, 2020). Oakland's program closed off select streets in the city to through traffic, leaving space for bicyclists and pedestrians to travel freely, while remaining physically distant.

Following Oakland's launch of its Slow Streets program, San Franciscans pushed their own city to propose a similar initiative (Rudick, 2020a). In response to citizen demand, the San Francisco Municipal Transportation Agency (Barnett, 2020a) launched its own Slow Streets program which included 12 streets in the initial pilot (Rudick, 2020b). These streets were mostly in residential areas and not along public transit routes. In order to assess citizen perceptions of the program, SFMTA issued an online questionnaire in April, 2020. Among the questions, the city asked respondents to recommend future streets to join the Slow Streets network. In addition, SFMTA received over a thousand one-off emails from citizens providing comments and requests about the program. While this program has received overwhelmingly positive support, with SFMTA citing an 80% approval rating (Barnett, 2020b), SFMTA has yet to perform research evaluating the effectiveness of its outreach and communication about the program.

The purpose of this study is to analyze the recommendations from the questionnaire and citizen emails to extract implications for future Slow Streets and help guide SFMTA's outreach and communication efforts moving forward. SFMTA outlined a set of criteria for its designation of Slow Streets, including the requirement that designated streets are not part of a commercial corridor, not on a public transit route and must be on a flat street. In order to determine if citizens understand these eligibility criteria, I will leverage a spatial analysis method to examine if they are recommending streets that do not fit into SFMTA's criteria. Furthermore, the study will also use Python to quantify which areas of the city are overrepresented in the recommendations. Employing additional spatial analysis, I will explore the significance of these counts through overlaying

socio-demographic secondary data on top of the recommendations. I will then use the emails to complement the spatial analysis, as they detail exactly what San Franciscans are saying about the program.

After analyzing both data sources, I will make recommendations for areas of the city that SFMTA is not reaching with its Slow Streets outreach and communication efforts, and where it needs to put in more time to understand community needs for bike/pedestrian safety. More specifically, this capstone project will examine the following questions: What are San Franciscans' perceptions of the program? Do they understand the function of the program and do their suggestions fit the program scope? How are citizen responses different based on the socio-demographic characteristics of the neighborhoods they live in?

Given that Slow Streets are a nascent phenomenon, there is limited research about how urban residents have perceived these types of environments. In addition, critics of Slow Street initiatives have cited their failure to adequately meet the needs of communities of color (Thomas, 2020) In this capstone project, I seek to fill some of the gaps in current research and also draw from attitudinal data to delve into ways that San Francisco can improve its communication about its Slow Streets program and fulfill the mobility needs of all San Franciscans.

The study begins by giving a background and context about Slow Streets and livable streets in the United States and the world. I then review the literature to explore how Slow Streets began in the country and in San Francisco. Additionally, I consider the precedent of livable streets, particularly in San Francisco, and how prior programs primed the city for a robust Slow Streets movement. Next, I provide an overview of the data sources and methodology I have used to assess San Francisco's Slow Streets program. Next, I use a mix of qualitative and spatial analyses to explore patterns in the recommendations and emails that the city received from San Francisco residents. I rely especially on overlaying secondary data of public transit routes, zoning, slope, zip codes, median household income, and race to inform my findings. Finally, I develop a list of policy recommendations for SFMTA on how the city can best target its resources and messaging for future outreach and communication.

Background and Context

Slow Streets is a term used by the San Francisco Municipal Transportation Agency to designate streets that have been closed to thru traffic and are primarily for those traveling by foot or bicycle (Barnett, 2020a). These streets remain open to emergency vehicles and vehicles from residents who live on the closed-off streets. SFMTA created its Slow Streets program to provide more space for people to be able to socially distance while traveling during the COVID-19 pandemic. After the issuance of shelter-in-place mandates around the United States, many cities implemented slow streets programs, including Oakland (*Oakland Slow Streets*, n.d.), Seattle—under the name "Stay Healthy Streets" (*Stay Healthy Streets - Transportation | Seattle.Gov*, n.d.), and New York City—under the name "Open Streets" (New York City DOT, n.d.).

SFMTA has identified the following qualities that help make a Slow Street successful (Barnett, 2020b):

- Approximately 6-8 blocks long
- No more than two lanes, preferably one in each direction
- Residential areas
- Mostly flat
- Connections to bike lanes and parks
- Stop sign-controlled intersections, 4-way stops are best
- No Muni [San Francisco transit], commercial loading or emergency route conflicts

While Slow Streets were designated as a response to current needs generated by the COVID-19 pandemic, **livable streets** or **living streets** have pre-existed in some U.S. cities, as they refer to a movement that came of age in the United States in the 1980s. The movement focuses on "streets that seek to better integrate the needs of pedestrians and local developmental objectives into a roadway's design" (Dumbaugh & Gattis, 2005). Many cities across the country have implemented livable streets plans, which particularly focus on pedestrian and bike improvements such as widening sidewalks, implementing protected bike lanes, and sometimes closing streets to vehicular traffic.

Literature Review

This project analyzes citizen responses to Slow Streets in San Francisco to determine their attitudes and level of understanding of the program. To understand the context of how Slow Streets emerged, the literature review explores existing literature about Slow Streets and livable streets—which impacted the thinking and adoption of the Slow Streets program. Given that San Francisco began its program in tandem with other cities, the literature review also considers similar programs from cities around the world.

Because Slow Streets are a relatively nascent phenomenon—only emerging during the COVID-19 pandemic and nationwide lockdown in the spring of 2020—the literature review is limited in its scope. While academic research has begun to scratch the surface with regards to livable streets, Slow Streets have yet to be analyzed in depth. Therefore, I will cite academic literature about livable streets, while most of the literature mentioned about Slow Streets comes from news articles and blogs.

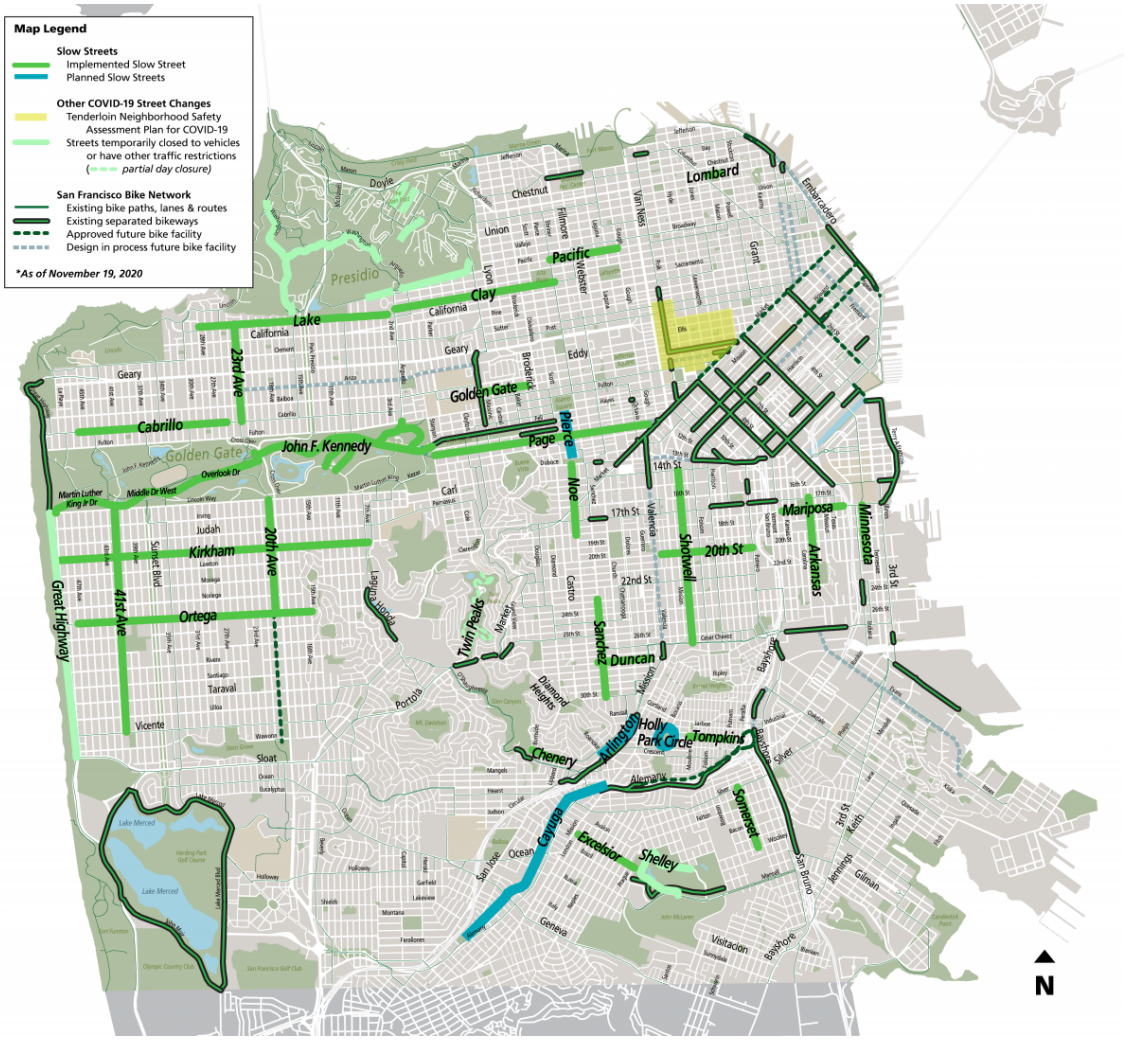
In addition, this report seeks to explore equity critiques of Slow Streets and their ability to have a meaningful impact in low-income neighborhoods and communities of color. While there are a number of critical thinkers in this space, given the recent emergence of Slow Streets, there are also limited articles pointing to these critiques. In addition, the academic research that explores the effects of bike- and pedestrian-centric streets on communities of color usually make connections to livable streets, not Slow Streets—and even this area of research is limited. Therefore, in my literature review section exploring equity, I will focus mostly on the academic findings behind livable streets, rather than Slow Streets.

Slow Streets in San Francisco

Slow Streets began as a phenomenon in response to the COVID-19 pandemic and shelter-in-place mandates across cities in the United States. In April 2020, Oakland, CA became the first city in the United States to launch a robust network of Slow Streets that were closed off to thru traffic. Other cities had experimented with closing off specific corridors, but Oakland paved the way for pedestrian and bike networks throughout the city. Oakland's program provided residents with more space to socially distance when moving throughout the city or simply when stepping outside (Bliss, 2020).

Meanwhile, residents throughout San Francisco posted photos of crowded streets and pushed the city to follow Oakland's lead (Rudick, 2020a). Finally, within the same month, San Francisco rolled out Phase 1 of its Slow Streets program with 12 streets in the initial pilot (Rudick, 2020b). Within three months, the city rolled out two more phases to include a total of 24 corridors in the program (Barnett, 2020a), as seen in **Figure 1.**

Figure 1. Slow Streets Corridors in San Francisco



Source: San Francisco Municipal Transportation Agency

Response to the San Francisco Program

The Slow Streets program received overwhelming support from the San Francisco community. In a survey of San Francisco residents, SFMTA cited an 80% approval rating (Barnett, 2020b). However, the city has seen some

opposition attempting to bring the program to a halt. On a smaller scale, some drivers have vandalized and collided with the signs the city has temporarily used to block off the roads to traffic (Hammerl, 2020). At a larger level, two individual critics of the Slow Streets program in the city filed an appeal arguing that the program should undergo regular review under the California Environmental Quality Act (CEQA) (Knight, 2020). CEQA is in place to determine the environmental impacts of construction projects and make sure that projects mitigate damage. However, individuals in a city can leverage CEQA to stop projects, such as Slow Streets, from advancing. In September 2020, California passed legislation to exempt new bike lanes, transit-only lanes, and 'Slow Streets' from CEQA review (Rudick, 2020d). With this legislation in place, the city is now free to move onto its next phase of the Slow Streets program.

Another critique of the Slow Streets program is the lack of Slow Streets in crowded neighborhoods in San Francisco. In particular, critics have pointed to the Tenderloin neighborhood as an area that could benefit from the program, but has not yet had a street added to the network (Graf, 2020). The Tenderloin is one of the city's most densely populated areas and had some of the highest rates of COVID-19 cases. It is also one of the most low-income areas with a median household income of $23,513, with 30% of the neighborhood in poverty. The neighborhood also constitutes 57% people of color, which is higher than the city's average (San Francisco Planning, 2018).

In addition, all streets in the Tenderloin are part of the high-injury network in San Francisco's Vision Zero plan (Sisto, 2020). These factors, advocates argue, indicate that residents of the Tenderloin are in need of space to socially distance while outside. At the beginning of the Slow Streets rollout, SFMTA argued that the streets in the Tenderloin do not fit the criteria mentioned above and, therefore, make it challenging to implement a Slow Street in the area (Graf, 2020). In July 2020, SFMTA launched a plan for safer streets in the Tenderloin, which included reducing the number of traffic lanes on Jones Street, and giving space back to pedestrians. The plan also included added space for outdoor dining and for children to play in the streets on Saturdays. However, the city stuck by its original assertion that the Tenderloin is not a good fit for a full-fledged Slow Street (Kronenberg, 2020).

Livable Streets

The origins of Slow Streets stem from the worldwide livable streets movement. In the western world, academic research about livable streets originated with Don Appleyard of UC Berkeley when he published his book *Livable Streets* in 1981.

In an excerpt of his book, Appleyard argues that rights-of-way should return to pedestrians. He cites the already established Dutch concept of *woonerf* in which pedestrians can use the full width of the road, and cars are required to move at walking speed in specifically designated residential neighborhoods (Appleyard, 1980).

In their goals, livable streets center pedestrians and bicyclists with a focus on safety and healthy lifestyles (*Model Design Manual for Living Streets*, 2011). This movement focuses on venturing beyond the prioritization of automobiles on the roadways by employing multiple traffic calming measures. First and foremost, livable streets view corridor success beyond traditional metrics, such as level of service (LOS), an engineering metric that emphasizes the flow of traffic in a corridor. The livable streets benchmarks include reducing traffic fatalities, increasing trips made by foot, bicycles and transit, and decreasing vehicle usage (*Model Design Manual for Living Streets*, 2011).

Beyond the overall goals, the design components of livable streets create more welcoming streets for travelers not using a vehicle. These methods strive to make streets less friendly to vehicles and more friendly to those traveling by foot or by bike. Some of the features of the traffic reduction techniques include narrowing the section of the roadway reserved for vehicles, through methods such as road diets, which reduce the number of traffic lanes. In addition, livable streets guidelines stress the reduction of roadway speed limits down to 20-35 mph on all roadways, which lowers the risk of serious injuries from vehicle crashes (*Model Design Manual for Living Streets*, 2011).

With less space allocated for vehicles, livable streets manuals outline ways to give the right of way back to pedestrians and bicycles. These features include increasing the sidewalk space and restriping roadways to include bicycle lanes. With increased space for bicycles and pedestrians, the movement encourages the addition of street furniture and trees to add to the “livability nature” of the streets. In addition, manuals suggest that the best types of livable streets are those that form a contiguous bicycle or pedestrian network that allows for optimal mobility within a community (*Model Design Manual for Living Streets*, 2011). The emphasis on safe bicycle and pedestrian networks within a city point to some of the elements that most closely have influenced the later Slow Streets movement.

Since the rising popularity of livable streets in urban environments, research has demonstrated the effectiveness of livable streets in achieving critical health and safety goals. Studies have found that streets with livable streets elements, such as narrow vehicle lanes and safe pedestrian crossings, have led to fewer crashes,

injuries and fatalities (Dumbaugh & Gattis, 2005). In addition, livable streets have the potential to improve physical activity and health in communities (Kuhlberg et al., 2014). The rising evidence of the communal benefits of livable streets gave rise to the movement bursting in popularity around the world in several key cities. However, livable streets have received significant critiques, particularly around equity and which groups of residents are "safer" on a livable street. I will explore these critiques more in the "Equity Implications" section below.

Examples of Livable Streets

Even before Don Appleyard's book, the Netherlands stood out as one of the first countries to embrace closing streets to single-occupancy vehicles, with a pedestrian-only street in 1953 (Van der Zee, 2018). Since the publication of Appleyard's book, cities around the world have adopted the livable streets and *woonerf* concepts, sometimes under different names. In the early 1980s, Bogotá, Colombia became a prominent city in designing streets for bicycles, with its *ciclovía* initiative, in which streets are closed off to cars during certain days of the week, and residents are encouraged to use them for biking and physical activity (Kuhlberg et al., 2014). In 2016, Barcelona established "superblocks" in which the city blocked off nine square blocks of the city to all vehicular traffic (Roberts, 2016)

Immediately prior to the COVID-19 lockdowns and Slow Streets initiatives, two major cities in the United States banned cars from major thoroughfares. In October, 2019, New York City closed off 14th Street, a major crosstown network, to all vehicles. This new route allowed the crosstown bus to travel without congestion between the eastern and western portions of Manhattan (Hu & Salcedo, 2019). San Francisco followed suit and in January 2020, the city announced that Market Street, the central street in its Downtown district, would be closed off to all cars. Overnight the street was converted into a bus-, pedestrian- and bike-only corridor (Rogers, 2020).

On the heels of these historic closures, cities around the world suddenly found themselves in lockdown in response to the COVID-19 pandemic (Rudick, 2020a). Residents clamored for ways to move about freely and enjoy fresh air. Fortunately, cities like San Francisco had already prepared their residents for streets without vehicles. For guidance on how to move forward, cities already had a ready handbook from Don Appleyard with the exact model for a street without any cars in which pedestrians are not limited to just moving along a sidewalk.

Equity Implications

Both the livable streets movement and the nascent Slow Streets projects have received criticism for their approaches to racial equity on urban streets. Bike infrastructure, in particular, is often linked to gentrification and displacement of urban residents (Stehlin, 2015). Cities that have larger percentages of people who bike to work are also often more affluent (Florida, 2011), and cyclists are often affluent, White men (Steinbach et al., 2011), which holds true in San Francisco (Stehlin, 2015).

As the Slow Streets movement emerged, many voices from activists in communities of color in the transportation planning world expressed concern that these streets were being labeled as "safer" for pedestrians. According to these planners and activists, "safe streets" movements did not protect Black lives from being safe, given that Black people are disproportionately targeted by police brutality and harmed by environmental inequities (Thomas, 2020). These advocates pushed planners to consider the history of racism in transportation planning and ways that current infrastructure puts Black people at risk simply when moving from place to place. In addition, these articles advocate for more participatory planning processes that consider the needs and opinions of community members when building infrastructure in their neighborhoods (Butler, 2020).

Conclusion

While livable streets and Slow Streets are both trendy topics receiving a lot of press during the pandemic and in the last few years, there still isn't an exhaustive repository of research and news articles about the history of these concepts. In particular, articles about racial inequity in bike and pedestrian planning are largely missing from academic research. Nevertheless, most cities, like San Francisco, have adapted a livable streets plan and had built up momentum in the movement prior to the implementation of Slow Streets programs. These livable streets examples, accompanying academic research and news articles demonstrate where these movements have succeeded, and where they have fallen short.

In addition, while some news articles express the opinions of residents through data or even through single anecdotes, few identify to what extent residents understand these concepts. If citizens do not understand the program, it is difficult to analyze if their opinions about the program carry any weight. This report will set out to determine if residents correctly identify possible Slow

Streets and will interpret how well citizens understand the program. In addition, very little academic research about livable streets identifies solutions to properly engage communities of color about Slow Streets and livable streets—however, many transportation advocates regularly discuss this topic in the news or in speaking events ("Walk The Talk, Talk the Walk – Purplelining," n.d.). In my recommendations, I hope to fill these gaps in academic literature and assess how current public outreach programs have engaged with communities of color.

Data and Methodology

This study analyzes citizen responses to a questionnaire that SFMTA provided for its residents and one-off emails about the program. The purpose is to assess the successes as well as possible areas of improvement of SFMTA's outreach and communication of its Slow Streets program. To conduct this analysis, I examined citizen recommendations and emails they sent about the program to answer the following research questions:

- What are San Franciscans' perceptions of the Slow Streets program?
- Do they understand the function of the program and do their suggestions fit the program criteria?
- How are citizen responses different based on the socio-demographic characteristics of the neighborhoods they live in?

This investigation involved collecting a random sample of recommendations among 6000 responses from the SFMTA questionnaire. I then did a spatial analysis using secondary data to assess the geographic and socio-demographic data of the over- and underrepresented areas of survey responses. Through this spatial analysis, I assessed how closely these responses compared to the criteria set in place by SFMTA for their Slow Streets program. Based on this spatial analysis, I was able to investigate if and to what extent citizens were missing an understanding of the mission and function of the Slow Streets program. Through secondary socio-demographic data, I also examined if residents of certain neighborhoods were overrepresented in the recommendations compared with the residents of other neighborhoods. In addition, I analyzed citizen emails detailing their requests for the Slow Streets program to further investigate their level of understanding of the Slow Streets initiative.

Data Source Overview

This report examines data collected by SFMTA via both a questionnaire and emails that residents sent to SFMTA about the Slow Streets program. The questionnaire was created to pull citizen feedback about the program and to identify any needs citizens had for the future. The survey was administered online via the SFMTA Slow Streets website, and was available publicly from April (when the Slow Streets program began) to October 2020. The questionnaire was offered in English, Chinese, Spanish and Tagalog, but the vast majority of responses were in English.

The survey itself garnered over 6000 responses and asked multiple questions about citizen attitudes, priorities and recommendations for future Slow Streets. For the purposes of this project, I extracted 4000 usable responses—or responses that were not blank and accurately answered the questions—and pulled a random sample of 150 responses (about 4%) from the usable survey responses and focused on their recommendations for future Slow Streets. I chose 150 as a sample size as it was an appropriate number to still make generalizable conclusions about the responses. The survey recommendations indicate how closely (or not) the citizens' understanding of the program mirrors how SFMTA has publicly defined how it selects streets for the program.

The responses were provided in written form, and the sentence structure varied among participants (to see the entire survey, please look at **Appendix A**). To clean the data, I collaborated with a data analyst to leverage an automatic geocoding methodology into a shapefile, and then manually drew the 150 random responses in ArcMap. Later, I overlaid secondary source data on top of the recommendations to compare them with the criteria SFMTA has put in place for its Slow Streets. These criteria were as follows:

- Approximately 6-8 blocks long
- No more than two lanes, preferably one in each direction
- Residential areas
- Mostly flat
- Connections to bike lanes and parks
- Stop sign-controlled intersections, 4-way stops are best
- No Muni [San Francisco transit], commercial loading or emergency route conflicts

In this report, I chose to focus on the most vital components of the criteria for my analysis: residential areas, mostly flat, and without Muni lines.

In addition to the recommendations, I analyzed citizen emails to examine what citizens said about the program itself. I pulled a random sample of 141 emails about the Slow Streets program, and categorized each recommendation to determine what citizens requested the most (see **Appendix D**). This qualitative data allowed me to analyze SFMTA's outreach and communication in a deeper way by reviewing what citizens actually said about the program.

Table 1 lists all the data sources I used.

Table 1. Data Sources

Data	Source	Format
Citizen Recommendations	SFMTA Questionnaire	CSV file
Citizen Emails	SFMTA	CSV file
San Francisco Street Names	Data SF	CSV file
San Francisco Street Network	OSMnx	Shapefile
San Francisco Zoning	Data SF	Shapefile
MUNI Routes	Data SF	Shapefile
San Francisco Street Slopes	SFMTA	Shapefile
Median Household Income	American Community Survey	CSV file
Race	American Community Survey	CSV file

Data Assembly

Given that the survey recommendations were not in a cohesive format, I needed to employ an automatic method to scrub the data. To clean the recommendations and identify the most relevant responses, I worked with a data analyst at UCLA Institute of Transportation Studies (ITS) to find patterns in the response wording. We were able to pull the most relevant responses, which left us with about 4000 segments of citizen recommendations. For more detail about his work, please see **Appendix B**.

After importing the resulting shapefile into ArcMap, many of the segments were only partially complete—most only extended the length of a block. Therefore, I needed to edit each segment so that it completed the full segment length. I selected a random sample of 150 segments to hand draw the corridors of the entire citizen recommendation in ArcMap. As mentioned previously, I chose this number as it was an appropriate amount to still be able to make generalizable conclusions about the responses. For more details about how I made the selections and drew the segments, see **Appendix C**.

To quantify the spatial analysis, I also used a spatial join in Python to determine how many recommendations were in each zip code in the city. This allowed me to make a more concrete assessment as to how significant the over- and under-representation of recommendations were across the city.

To analyze citizen emails, I pulled a random sample of 150 emails and categorized them by the subject matter of each email. SFMTA had provided me with their email categories (**Appendix D**). After categorizing each email, I was able to calculate the percentages of each email category out of the entire sample of emails to determine which categories were more prevalent in proactive communication from San Franciscans (more details in **Appendix E**).

Data Limitations

Using SFMTA's questionnaire to assess citizen responses to Slow Streets has several limitations. First, the survey itself was conducted only online and required most participants to have proactively sought it out on SFMTA's website. Therefore, it does not properly represent all San Franciscans' perceptions, as it leaves out many residents, especially those with limited internet access.

In addition, the survey does not ask for socio-demographic data—other than the respondents' zip codes. Therefore, it is challenging to make any direct assumptions about the socio-demographic characteristics of survey participants. Therefore, I had to use socio-demographic data from the American Community Survey that described the areas in which participants reported living. This data acted as a proxy for individual socio-demographic data.

Finally, given time constraints, capstone deadlines, and conducting all spatial analyses through Remote Desktop, I was only able to pull a sample of the responses and the emails. If I had more time and access to appropriate software, I would have pulled the entire population for a more thorough analysis of patterns in citizen responses.

Findings and Analysis

This next section examines patterns of survey responses and resident emails. In particular, I focused on the recommendations respondents provided for future Slow Streets, as well as the zip codes in which respondents stated they lived. To dig into how residents expressed their opinions of Slow Streets, I analyzed citizen emails sent directly to SFMTA. From there, I assigned a category to each email and calculated overall percentages of each category.

Spatial Analysis

In this section, I outline patterns in the citizen recommendations using spatial analyses. I manually mapped out each of the 150 sample recommendations and then overlaid them on top of physical and socio-demographic traits of the city. **Figure 2** shows all of the recommendations in San Francisco without any additional overlays. While I mapped 150 corridors, many of them were suggested multiple times and therefore appear as one corridor since the polylines are on top of one another.

The recommendations vary in terms of length of segment. Some are quite long, spanning miles throughout the city, while others are just a block or two. The SFMTA criteria says that Slow Streets should be 6-8 blocks long. A few of the recommendations do fit this length, but most are shorter or longer than this measurement. Given the varying lengths of Slow Streets within the recommendations, it would help SFMTA to reiterate this section of its criteria.

At first glance, it's also clear that the recommendations are more prevalent in the eastern and particularly northeastern sections of San Francisco. The southern end of the city has barely any recommendations and the southeast corner has none. In the sections below, I will discuss in more detail why it is significant that most of the recommendations were concentrated in the northeastern sections of San Francisco.

Figure 2. Citizen Recommendations

Public Transit Routes

One of the main criteria that SFMTA has laid out for Slow Streets is that they do not overlap with public transit routes, or Muni. In order to determine if residents understood this portion of the Slow Streets criteria, I mapped Muni routes on top of the recommendations. **Figure 3** shows the recommendations as smaller red lines and the Muni routes below in thicker gray lines. When the recommendations overlap with a Muni route, the red segments appear on top of the gray segments.

In the below image, many recommendations are still the red lines alone and, therefore, do not run along public transit routes. This is particularly true in the

western end of the city, where the recommendations are longer segments and there are fewer public transit routes than in the east.

In the eastern end of the city, Muni routes are much more prevalent. Downtown San Francisco has public transit running along almost every block running east-west and many running north-south. Therefore, quite a few of the recommendations directly overlap with public transit routes, especially in the South of Market (SOMA) area. However, even along major corridors like Market Street and The Embarcadero, citizens have recommended Slow Streets.

This map demonstrates that while the vast majority of recommendations still follow the guidelines, a significant set of the responses still choose major transit corridors. Some of these corridors—like Cortland Avenue in Bernal Heights and San Bruno Avenue in Portola and Visitation Valley—are primary access points to these neighborhoods. As such, closing these streets off to vehicles would limit how the communities would be able to travel, given the major transit routes in the area run along these streets.

Figure 3. Recommendations and Public Transit Routes

Slope

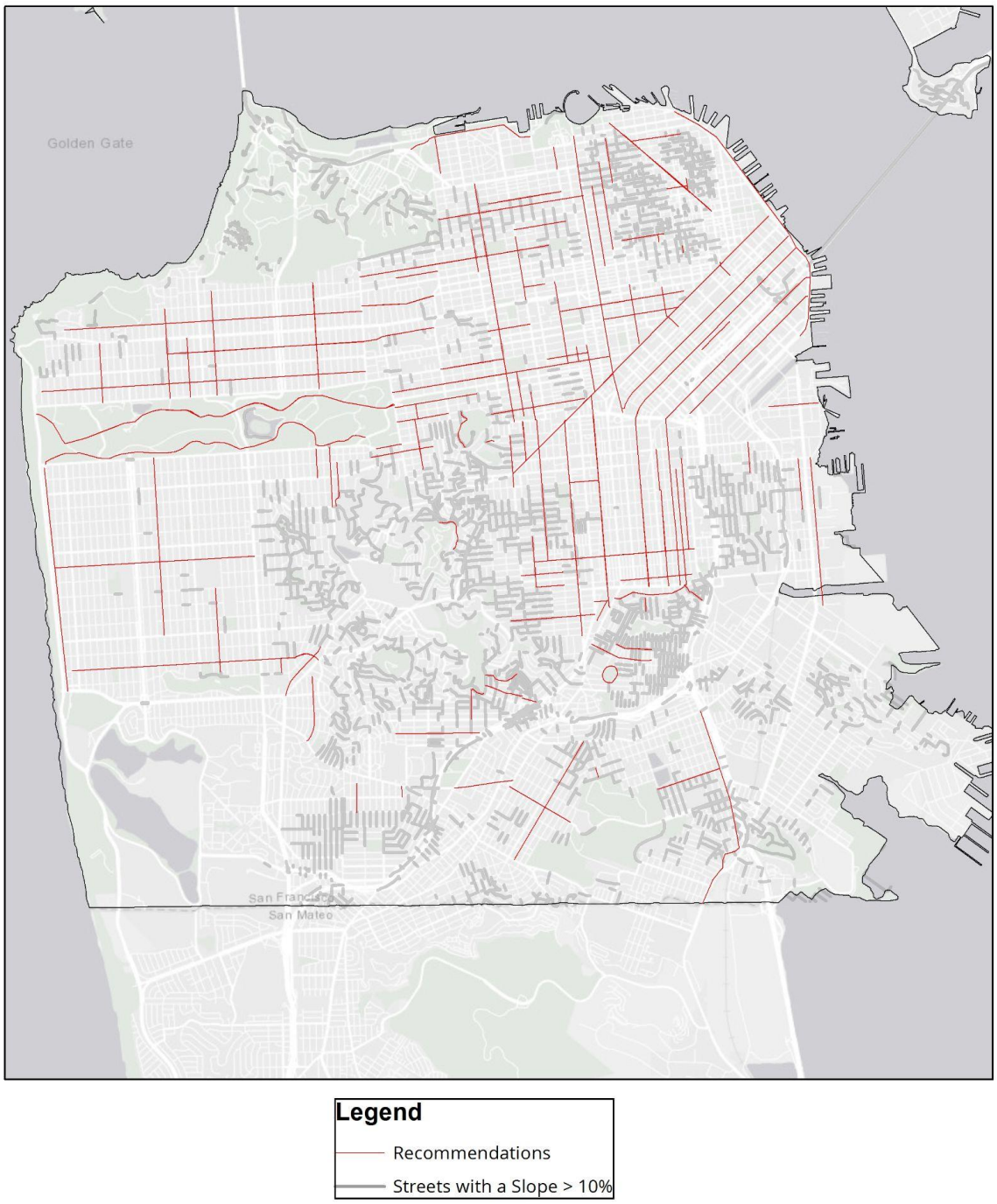
Another main piece of criteria that SFMTA has publicized for its Slow Streets is that streets should be in flat areas of the city—SFMTA defines flat as a slope less than or equal 10%. Figure 4 shows how the Slow Street recommendations compare with the steepest streets of San Francisco. The red lines are the

recommendations and the thicker gray lines represent streets in San Francisco whose slope is more than 10%.

Overall, most recommendations do not overlap with the steepest streets in the map. There are a few that touch steeper areas at the end of a long segment. SFMTA has said that the steepness of the street is not as significant if it is part of a longer street that fits the criteria in the rest of the corridor. Therefore, these segments are not as problematic, since most of the segments are suitable for a Slow Street.

However, there are a few corridors whose entire recommendation touches steep areas of the city, particularly in the central southern area of the city and in the north of the city, but these segments are outliers. In most of the city, slope does not seem to be a major gap of understanding for the public. Given that most people probably would not want to walk or play along a hilly corridor, it makes sense that slope is not a major concern in SFMTA's outreach and communication efforts. In areas of the city in which the entire neighborhood is steep and the corridors are short, SFMTA could conduct outreach to figure out how to cater to these communities' needs given that most of the neighborhood does not qualify for a Slow Street.

Figure 4. Recommendations and Streets with a Slope Higher than 10%

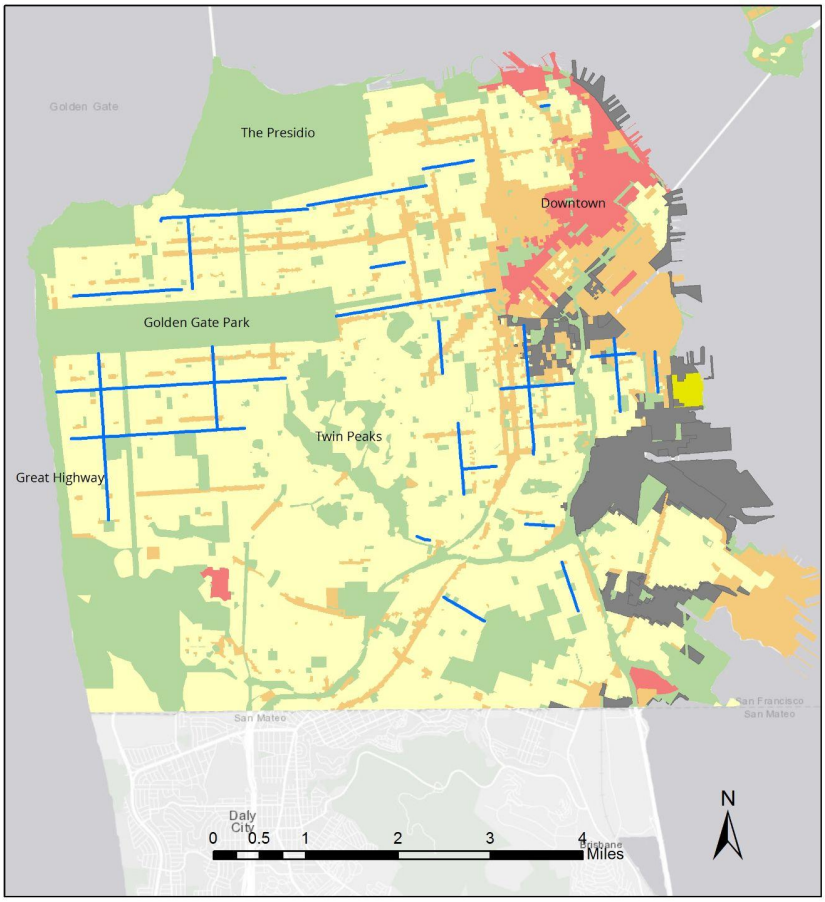


Land Use

A key component of the SFMTA criteria is that Slow Streets be in residential areas. **Figure 5** demonstrates the map of the current Slow Streets in San Francisco up to

Phase 3. These streets are primarily along residential corridors (the light yellow). In addition, the Slow Streets are near or connect to public parks, which are depicted in green.[1] Currently, the Slow Streets that are in public parks (Golden Gate Park, the Presidio, Twin Peaks and the Great Highway) are through a partnership with San Francisco Parks and Recreation and are, therefore, not on this map (*Golden Gate Park Slow Streets | San Francisco Recreation and Parks*, CA, n.d.).

Figure 5. Implemented Slow Streets and Zoning



Of all the Slow Streets criteria, zoning is the area where there is the most discrepancy between the design of the program and how citizens are understanding it. When comparing the current Slow Streets in **Figure 5** with the recommendations

[1] Freeways are also zoned as public

in **Figure 6,** there are some major differences. First, a lot of the Slow Street recommendations run within public parks, such as along the Great Highway or in Golden Gate Park. This is particularly evident in the "Zip Codes" section in **Table 2** as 94122, which contains Golden Gate Park and the Great Highway, was tied for second as the zip code with the most recommendations. However, as mentioned before, many of these corridors are closed to cars either all day or during particular hours through a partnership with the San Francisco Recreation and Parks department. Even with this partnership, the SFMTA Slow Streets website still indicates that these corridors are Slow Streets (Barnett, 2020a). Given this discrepancy, if it is important that residents know the distinction, it could be valuable for SFMTA to indicate the difference between corridors within and outside of parks in its online map and list.

Another key difference between the implemented streets and the recommendations is that many of the recommendations are in commercial or mixed-use corridors. Of note, none of the implemented corridors run through Downtown San Francisco, which is primarily commercial. However, a significant portion of the future recommendations are concentrated in Downtown (in **Table 2**, Downtown zip codes like 94103, 94102 and 94105 are high on the list of recommendation counts).

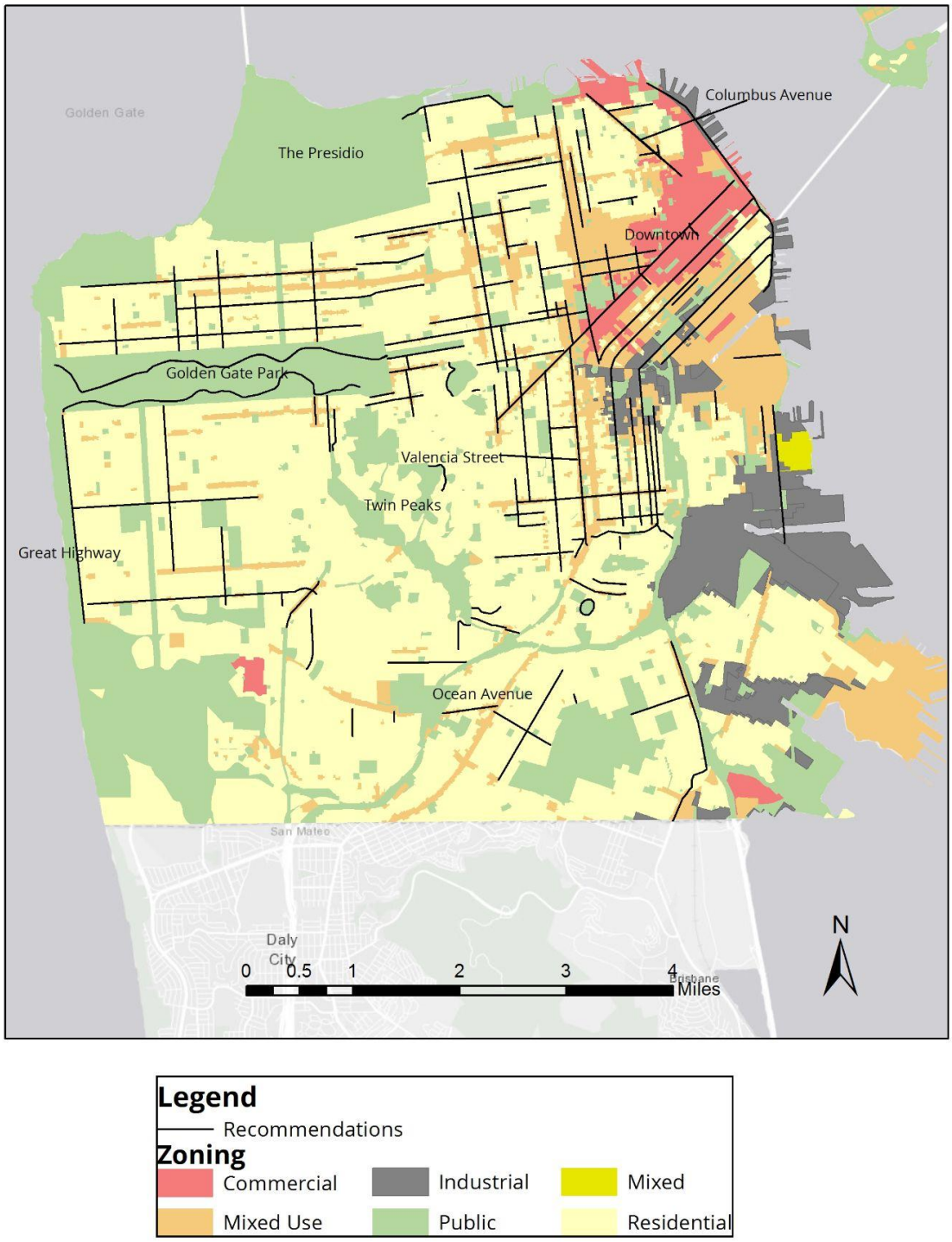
In addition, even recommendations outside of Downtown are concentrated along the mixed-use corridors in neighborhoods. These corridors—like Valencia Street in the Mission, Columbus Avenue in North Beach or Ocean Avenue in the Outer Mission—are the primary commercial streets for these communities. Many of these corridors overlap with the public transit routes that are suggested recommendations, as mentioned in the previous section. However, the zoning discrepancy seems to be larger than the public transit route discrepancy.

Therefore, it is clear that the messaging about Slow Streets as residential corridors has not come through to San Franciscans. Perhaps, many residents are confusing Slow Streets with Shared Spaces, which is another street closure program from SFMTA. This program allows retail and restaurants to use curbs and sometimes streets for outdoor dining and retail activities (Pierce, 2020). However, this program is different from Slow Streets, whose primary purpose is for mobility.

While it may not be that important for residents to know the difference between a program that closes streets for dining and one that closes streets for getting around, it is clear that part of SFMTA's messaging has not reached residents. Residents who are proactively making recommendations probably constitute a share of the population with more interest in Slow Streets than most San Franciscans. Yet, SFMTA is still not even reaching this population with the messaging about the full function of its program. Again, it may not be critical for residents to know the

difference between SFMTA programs, but a miscommunication in one area could mean that residents are not understanding other functions of the program as well.

Figure 6. Recommendations and Zoning



Socio-Demographic Traits

The previous sections explored the spatial characteristics around the Slow Street recommendations. In the below sections, I will explore the socio-demographic traits of the survey respondents themselves and of the notable areas from survey recommendations.

Respondent Zip Codes

Within the survey, participants were asked to provide their home zip codes. This is the only piece of socio-demographic data SFMTA pulled about participants and is, therefore, the only direct information I have about participants themselves. **Figure 7** overlays the prevalence of participants' home zip codes with the recommendations. In this map, it is clear that survey participants come from the center of the city and few, if any, participants are from the outer neighborhoods of the city. The survey also received many responses from residents scattered throughout the northern regions of the city.

Table 2 supplements the data on **Figure 7** and quantifies the recommendations by counting the number of recommendations per zip code and the percent of total. There are duplicates given that some recommendations spanned multiple zip codes (therefore, the percentage total is more than 100%). To clarify, **Figure 7** categorizes zip codes by where respondents live and **Table 2** categorizes zip codes by where recommendations are.

The two zip codes (94110 and 94117) with the most respondents living in them also were among the top two zip codes for recommendations (**Table 2)**, with 17% and 15% of the recommendations respectively. From this pattern, it's likely that many people recommended Slow Streets in their home neighborhoods. However, some of the areas that had more recommendations like SOMA (South of Market) or 94103, which had 16 recommendations and was tied for third most, did not have as many respondents living in them. It is important to note, however, that a few of the recommendations in SOMA are corridors that connect to the Mission District (94110), which was one of the areas that was most prominently represented.

In addition, as mentioned before, the zip code tied in second in recommendation counts was 94122, which contains Golden Gate Park and the Great Highway. The zip codes in the southern area of the city have some of the lowest counts of recommendations, with 94134, 94132 and 94124 with 3, 2, and 1 recommendation respectively. Of note, 94132 and 94124 may have recommendations that technically go inside their zip code boundaries but when examining **Figure 7**, these recommendations barely enter these zip codes and are mostly in neighboring zip codes.

Given that SFMTA mostly heard from residents concentrated in the central and northern areas of the city, the survey is not representative of the entire population of the city. The survey sample is skewed more towards certain areas of San Francisco and leaves out entire outer regions of the city. In addition, just because certain areas of the city contain more recommendations, it does not necessarily mean these areas are more fit for Slow Streets than the ones without many recommendations. It is possible that residents just recommended areas of the city with which they were more familiar.

It's also worth noting that this skewed sample makes sense given the distribution of the survey. SFMTA posted its questionnaire on its website and did not conduct proactive outreach to involve historically underrepresented communities in the survey. In addition, the survey was only accessible to those with internet access. While SFMTA has said it will conduct future outreach to neighborhoods that were not as represented in this survey, the survey itself is not a proper sample of the entire San Francisco population.

Figure 7. Recommendations and Zip Codes

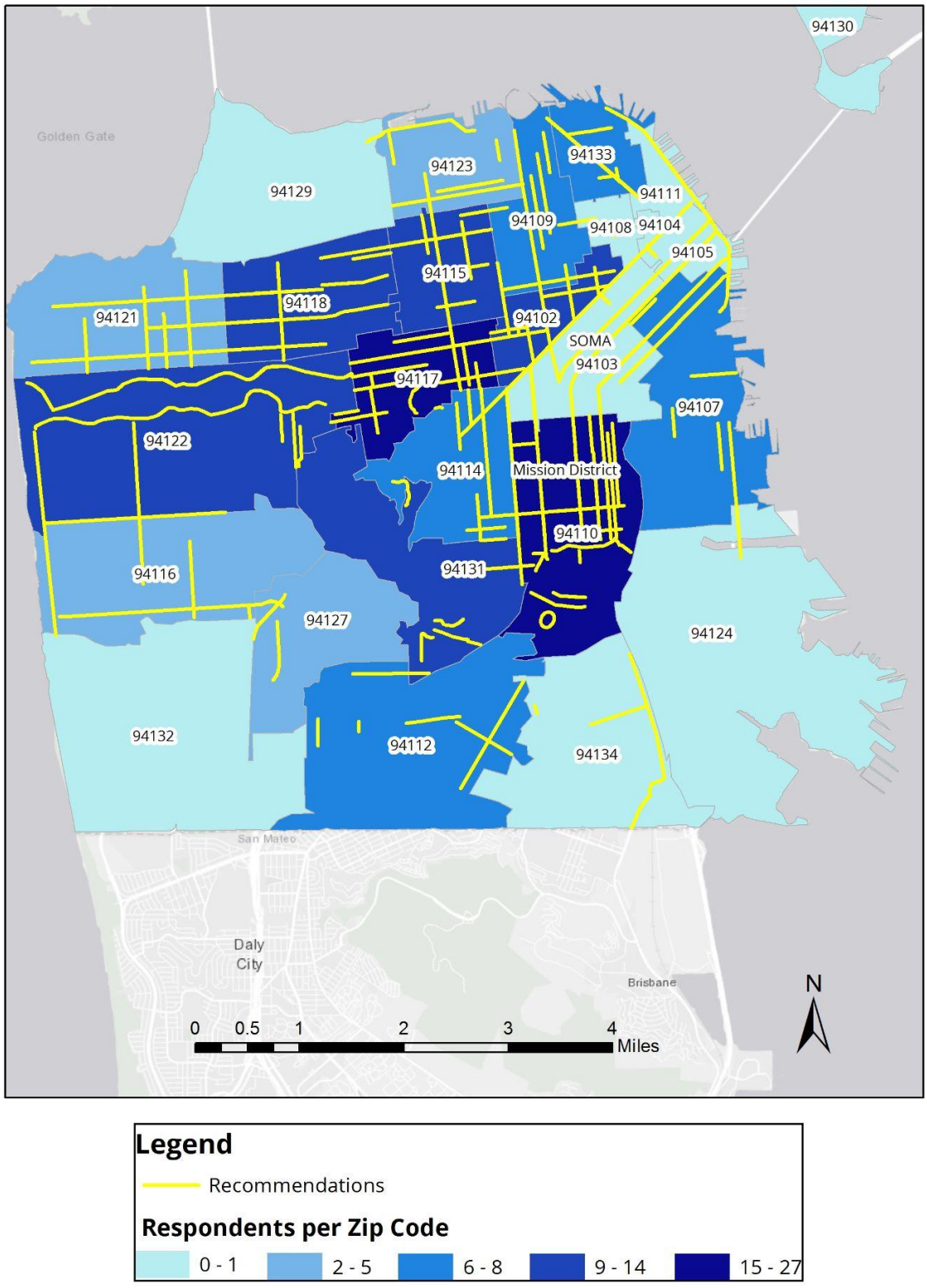


Table 2. Recommendation Counts Within Each Zip Code

Zip Code	Number of Recommendations	Percent of Total
94110	26	17%
94117	23	15%
94122	23	15%
94103	16	11%
94114	16	11%
94131	14	9%
94109	13	9%
94118	13	9%
94102	12	8%
94115	12	8%
94107	9	6%
94123	9	6%
94121	8	5%
94105	7	5%
94112	7	5%
94116	7	5%
94133	7	5%
94108	4	3%
94111	4	3%
94127	4	3%
94134	3	2%
94104	2	1%
94132	2	1%
94124	1	1%
94129	1	1%

Median Household Income

While respondent zip codes demonstrate that the survey skewed towards the central and northern parts of the city, the following maps clarify how each of these areas of the city differ from one another. The first variable that I looked at was median household income. **Figure 8** divides the city up by census tract and records the median household income per each census tract. I then overlaid the recommendations on top of the data to compare the prevalence of recommendations with a census tract's economic conditions. It is worth noting that

San Francisco has some of the highest incomes in the United States, so even an income in the lower quintiles in the city is still high comparatively.

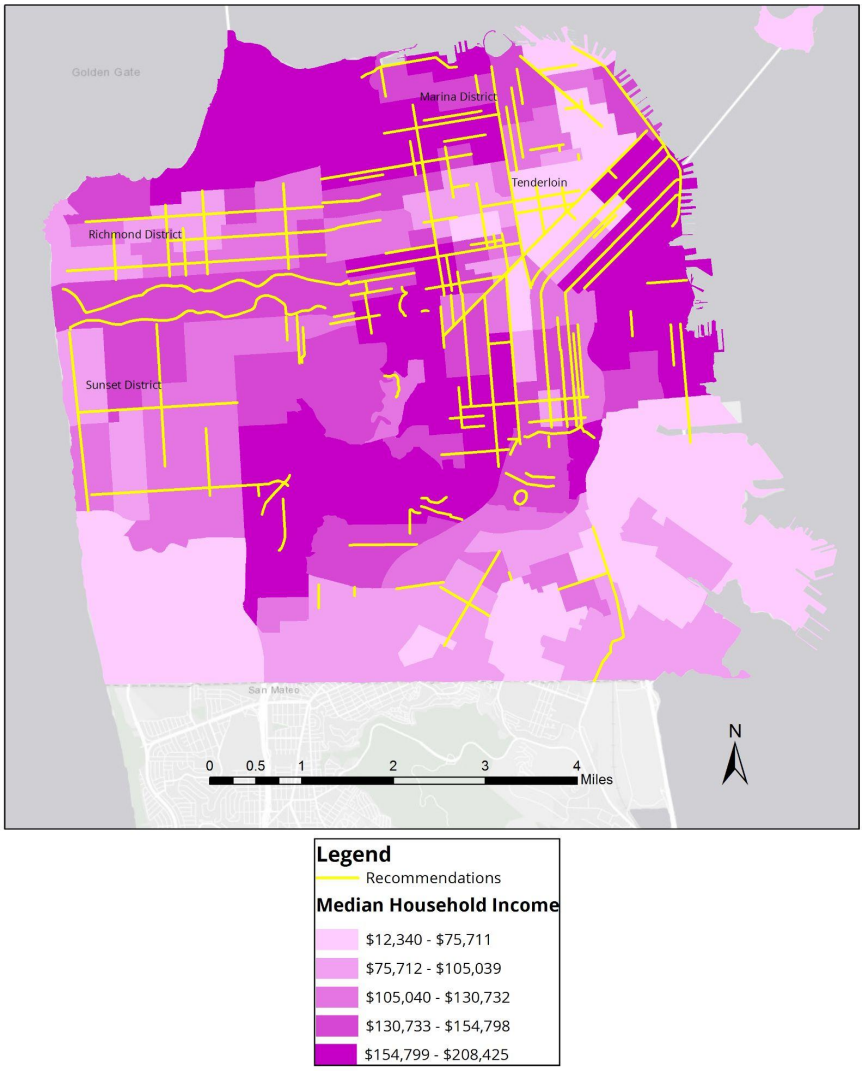
The areas that received the most recommendations and included the zip codes with the most respondents are some of the wealthiest areas of the city. The highest wealth quintile is prominent in the central areas of the city, with the highest density of recommendations. However, unlike some of the northern areas of the city, these areas are also relatively mixed in terms of overall income from one census tract to another. Many of the income brackets in the center of the city are very different between one neighborhood to the next. This pattern also holds true in the western parts of the city, in the Sunset and the Richmond, which were still represented in the recommendations. Within these neighborhoods, the income distribution is also mixed from one census tract to another.

However, in the areas of the city that are more uniformly low- or high-income, the higher income areas received more recommendations. This is particularly true of the northern tip of the city, around the Marina, which received a significant number of recommendations (in **Table 2**, nine recommendations are in 94123). These areas did not receive as many recommendations as the central areas of the city, but still do have representation among the recommendations.

On the other hand, the southern end of the city, which is the most uniformly low-income area of the city received sparse recommendations. In **Figure 7**, these areas were the most underrepresented from participants' residences and were most underrepresented in **Table 2**. Therefore, these areas are missing participants' voices and suggestions for recommendations for the future. Again, the survey is not a direct sample of the San Francisco population, and is directly missing voices of the most low-income San Franciscans.

Another important note is the representation of recommendations in the Tenderloin. While the Tenderloin is one of the most low-income areas of the city, it is surrounded by wealthier neighborhoods. As such, the Tenderloin is one of the few low-income areas of the city that is still represented in the recommendations (with 12 recommendations in 94102 in **Table 2**). **Figure 7** also demonstrated that residents of the Tenderloin were still represented in the survey respondents. Overall, 58% of the recommendations in 94102 were from respondents who also live in 94102. In addition, the Tenderloin received a lot of press about its lack of Slow Streets, as discussed in the Literature Review. There was also an email campaign to encourage SFMTA to put more Slow Streets in the Tenderloin (as discussed in the Email Analysis section), which could also explain why it has more recommendations than other similarly low-income areas.

Figure 8. Recommendations & Median Household Income by Census Tract



Sorted by quintiles

Race

In order to properly address any imbalances in the locations of the recommendations, it is critical to examine the recommendations in conjunction with the racial demographics of the city. To do so, I overlaid the city's White, Black, Asian, and Hispanic Latino demographics on top of the recommendations. **Figures 9** through **12** demonstrate each of these racial distributions by percentages per census tract.

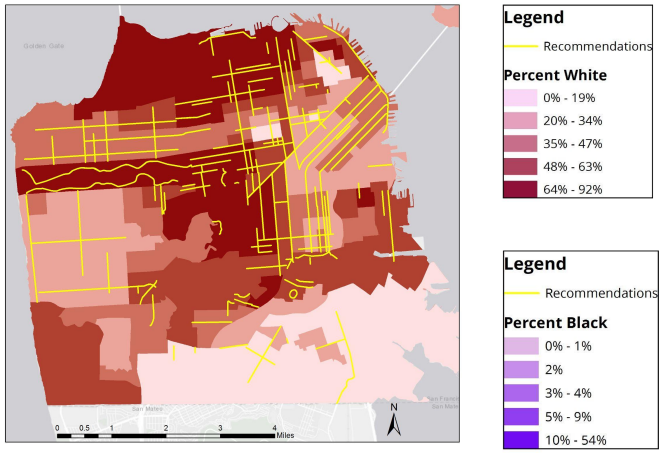
Before analyzing any of the data, it is important to look at the scales on each of the maps. In any given census tract, the highest percentage of White residents is 92%,

and 94% for Asian residents. However, the highest percentage of Hispanic Latino is 56% and the highest percentage of Black is 54%. Therefore, it is worth mentioning that even when I describe areas with high percentages of White or Asian populations, it is an entirely different circumstance than areas with a high percentage of Black or Hispanic Latino populations. In San Francisco, Black and Hispanic Latino populations may have higher representation in certain areas, but even in those spaces, they are still likely to be less than half of the population, or barely more than half of the population.

Returning back to the central areas of the city with the most recommendations and the zip codes with the largest portions of respondents, many of them are areas with a mix of racial representation. The Mission is one area that received a lot of recommendations. This is an area that is historically a center for the Hispanic Latino population, and still has a high percentage of Hispanic Latino residents in **Figure 12**. It is also an area with an influx of White residents who now make up 35-47% of the population (**Figure 9).** This same pattern of the prevalence of mixed-race areas holds true in the Tenderloin and Western Addition neighborhoods. Both of these neighborhoods are shown to have high percentages of Black populations in **Figure 10** but have large percentages of White populations as well. The western parts of the city, which are mostly split between White and Asian populations, are also represented in the recommendations (**Figures 9** and **11)**. However, these areas do not have as many recommendations as the areas that are mixed with White, Black and Hispanic Latino populations.

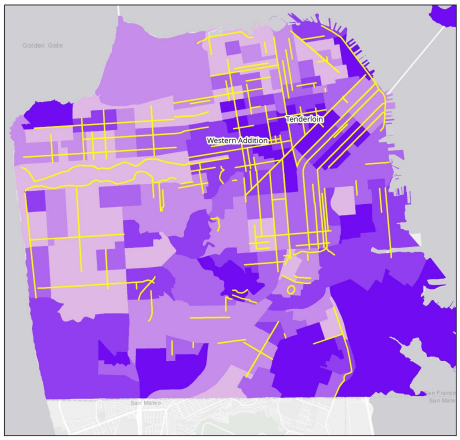
Because the survey is race-blind, the city has no way of knowing if the responses in mixed-race areas accurately represent the attitudes of the whole community. As such, the city does not know if it is receiving feedback from a diverse set of voices. Another important pattern is the distinction between the presence of recommendations in areas that are predominantly White versus areas that are mostly communities of color. Neighborhoods with high percentages of only White populations, like in the northern end of the city, are also represented in the recommendations, though, again, not as prominently as areas that have a mix of racial groups. However, areas that have low percentages of White populations, like in the southern areas of the city, are missing representation both from recommendations and from survey responses. Therefore, even if the city is pulling responses from people living in mixed-race neighborhoods, it is directly missing voices and recommendations from those living in neighborhoods that are explicitly Asian, Hispanic Latino and Black. To directly ensure that these voices are captured in future outreach, the city should prioritize deliberately communicating about Slow Streets with communities of color.

Figure 9. Percent White per Census Tract



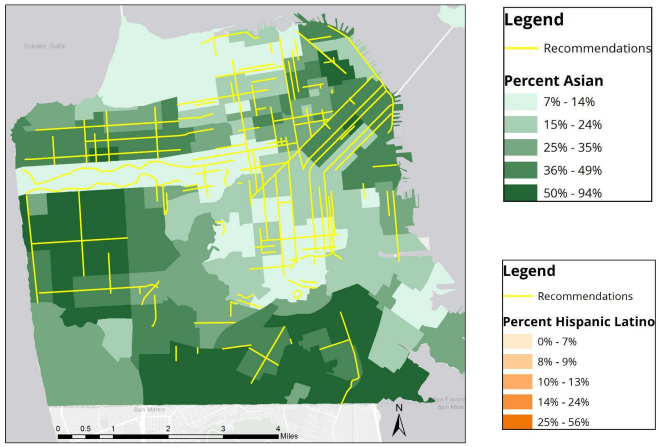
Sorted by quintiles

Figure 10. Percent Black per Census Tract



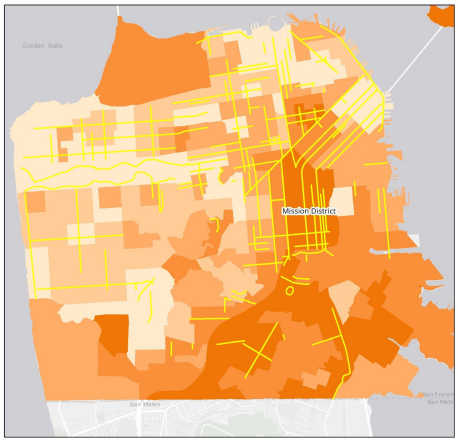
Sorted by quintiles

Figure 11. Percent Asian per Census Tract



Sorted by quintiles

Figure 12. Percent Hispanic or Latino per Census Tract



Sorted by quintiles

Email Analysis

In order to delve more deeply into citizen attitudes about Slow Streets, I examined emails with direct quotes about the program. In total, there were a little more than 1400 emails, so I pulled a 10% random sample, and analyzed 141. Based on the contents of the emails, I labeled them with one or two appropriate

categories as designated by SFMTA beforehand. See **Table 3** for the distribution of email categories. Sixty-five had two categories attached to them, which is why the total number amounts to more than 141. I added the survey category based on patterns I noticed and the Tenderloin category in order to determine the prevalence of the Tenderloin mass email (more detail below).

Table 3. Category Distribution of Emails

Email Type	Number	Percentage of Total
General Comments		
General support	35	24.82%
Tenderloin-related	28	19.86%
Corridor recommendation	23	16.31%
Questions	15	10.64%
Complaints		
Missing signage/barricade	34	24.11%
Traffic safety	32	22.70%
Vehicle access	9	6.38%
Traffic-related	9	6.38%
Health-related	5	3.55%
Public nuisance	5	3.55%
Broken signage/barricade	5	3.55%
Parking impacts	3	2.13%
Survey and outreach	3	2.13%

General Support

Overall, the most common topic for emails was general support. Many emails expressed support for the program and added additional suggestions. These emails were not tagged as general support. Rather, emails that simply expressed support and/or suggested a non-specific expansion were given the "general support" tag. Among these emails was a mass email blast sent about expanding the Slow Streets program to the Tenderloin neighborhood. The text of these emails varied, but often sounded something like:

> To SFMTA Board: I'm writing to you in strong support of Slow Streets, a new program that has helped so many people to enjoy our streets safely during this pandemic. I hope the SFMTA Board joins in the support of this program and finds ways to make this program more permanent so that we can enjoy safe, calm and sustainable streets throughout San Francisco.
>
> While many San Franciscans have enjoyed Slow Streets, I am also asking you to urgently implement Slow Streets in the Tenderloin and other neighborhoods that do not have Slow Streets corridors yet. This program will only be successful if all San Franciscans can enjoy and access these streets. (Anonymous, personal communication, 2020c)

Out of the 141 total emails in the sample, 28 or 20% followed this format and advocated for expanding Slow Streets to the Tenderloin area. While these emails were the same or similar across each email, they differed from most emails in that most senders weren't necessarily from the Tenderloin. Many who wrote these emails said they enjoyed Slow Streets in their own neighborhoods and wanted to also see others in the Tenderloin receive the same access. Unlike these emails, most of the other emails featured comments from residents about their own neighborhoods.

As mentioned previously, SFMTA expanded more open streets and play streets programs in the Tenderloin following citizen requests. However, I was unable to see the dates of the emails and couldn't determine if these emails were before or after those changes.

Traffic Safety

Another common theme in the emails was traffic safety. Traffic safety concerns constituted 32 emails or almost 23% of the emails. These types of emails were mostly in favor of Slow Streets. Many people who supported Slow Streets often remarked that a lack of signage or missing signage contributed to increased risk on the Slow Street. In these circumstances, I tagged the emails as both "traffic safety" and "missing signage." These emails often looked something like:

> Can we please request signage at every intersection on Clay street? My toddler son was almost hit by a speeding truck that had no idea it was a slow street because I saw them turn onto Clay from the intersection without signage.

> It seems signs are a small cost relative to the safety and liability you will save in return. (Anonymous, personal communication, 2020b)

Another common concern with traffic safety led some to suggest an alternative corridor for a Slow Street. In these circumstances, I tagged the email as “traffic safety” and “corridor rec.” Some of the citizens were pro Slow Streets and wanted to suggest a better corridor for a Slow Street, but some were adamant that a Slow Street was not suitable for their street given safety concerns. Here is an example of someone who is pro Slow Streets, but prefers another corridor:

> I wonder how the END signs can be more obvious and respected and the smaller cross street with a sign to just cross 20th street and not turn on it.
>
> I also wonder why 22nd street wasn't chosen since it’s already a bicycle path. I [sic] would be nice to consider changing it as it’s a more logical options and more kids live on that street. (Anonymous, personal communication, 2020a)

In this circumstance, like others similar to it, residents are in favor of the idea of Slow Streets, but based on their lived experiences, they think another street might reduce safety risks.

Corridor Recommendations

As mentioned, corridor recommendations were another popular category for the emails (23 or 16%). Many of the citizens who recommended corridors were in favor of Slow Streets and wanted to suggest ideas for new ones. Here’s an example of a corridor recommendation for a citizen who wants a Slow Street on his block:

> I am writing to request a slow street designation for Funston Ave, between Geary and Anza (the "Funston Slow Street Request" or "FSSR"). There are several families with school aged children living on the block of the FSSR.
>
> They are home everyday and would greatly benefit from being able to use the block of the FSSR to play games (basketball, hop scotch, tag etc) during Zoom screen breaks and after Zoom school ends.

> The FSSR is a high traffic area; among the high uses by drivers include (i) accessing Geary to go east, (ii) accessing the marijuana shop on Geary, or (iii) accessing Anza to go west or south on 19th Ave (Park Presidio). (Anonymous, personal communication, 2020d)

Many people who suggested Slow Streets also wanted their own streets to be available for their kids to play or to exercise. Oftentimes, one petition would be followed by more from neighbors.

However, not all corridor recommendations were in favor of Slow Streets. Here's an example from a citizen who is concerned about the parking impacts of a current Slow Street. This email was marked as "corridor rec" and "parking impacts." It has been edited for length.

> I am concerned about the Slow Street program related to West Pacific Ave adjacent to the Presidio Wall Playground…
>
> West Pacific Avenue is primarily used for parking for the Presidio Wall Playground where parents park and take their clild [sic], their strollers and other child gear to the playground. As you probably are aware there are very steep hill for neighborhood parking which is extremely challenging.
>
> Unlike other Slow Streets which are associated with small business and shopping, West Pacific Avenue runs adjacent to the presidio which has a walking path parallel to the avenue and plenty of open space.
>
> I am not sure why West Pacific Avenue was chosen for the Slow Street program, but I would like to offer an alternative. Close the street off at Arguello Blvd and open it at Presidio Blvd to NO THRU Traffic.
>
> This would accomplish shutting off thru traffic making it a safer (slower) street without impacting necessary parking. (Anonymous, personal communication, 2020e)

Personal stories and experiences were common in many of the negative corridor recommendations. For many, the lack of access to a certain street would make their own lives challenging, which they often outlined in depth in their emails. It is important to note, however, that this citizen makes a common error among other residents. In this email, the resident says that Slow Streets are mostly for "small business and shopping." Like many of the recommendations, this email

confuses Slow Streets with Shared Spaces, and therefore, has trouble understanding why West Pacific Avenue was closed off to traffic.

Overall Themes in Complaints

Another common thread that this complaint contains is the mention of safety in emails against Slow Streets. This resident writes primarily about parking for a playground, but ends with a note that the alternative street would be safer. Many negative emails remarked that making their street a Slow Street would, in fact, make the street more dangerous.

Among the complaints, few were very widespread except those complaining about missing signage/barricade and traffic safety. Even within these complaint categories, few of the complaints were negative. Most of them were from residents who enjoyed Slow Streets but wanted to see cars follow safety protocols more closely or wanted to see more signs to help cars follow the protocols.

Within the anti-Slow Street complaint categories specifically, no complaint was particularly common. In fact, none of them on their own even received 10% of complaints. I added up all complaint categories with the exception of the categories about missing/broken signage, Tenderloin, and traffic safety (which were often pro-Slow Street emails) and the total only came to 24%. Therefore, it seems that only a quarter of the survey population had any significant complaints about Slow Streets. Among these types of complaints, vehicle access and traffic-related were the most common.

Discussion of Findings

Spatial Analysis

After San Francisco's shelter-in-place order, SFMTA had to scramble to put together a Slow Streets network in the city. Therefore, it was unable to conduct the typical outreach that agencies normally pursue when developing large-scale infrastructure projects. In light of the swift pace in which the city had to conduct its outreach, there are a couple of gaps in citizen understanding and citizen representation.

The most critical area of confusion among San Franciscans surveyed by the city is the appropriate zoning designation for a Slow Streets corridor. Many San Franciscans who took the city's survey recommended Slow Streets in commercial corridors. While some of these corridors may have been closed off for other city programs, they are not good fits for Slow Streets. It would, then, benefit the city to demonstrate the focus on mobility for neighborhood Slow Streets.

In addition, the respondents and recommendations in the survey are not representative of the entire San Francisco population. Most of the respondents live in the center of the city, which was also where many of the recommendations were located (26 recommendations in 94110 and 23 in 94117, both of which are in the center). Many of the neighborhoods within these zip codes, like the Mission or the Western Addition have rapidly gentrified and are now a mix of White and either Hispanic Latino or Black residents (Urban Displacement San Francisco Map | Urban Displacement Project, 2018). As mentioned before, given the mix of racial backgrounds in these neighborhoods that are overrepresented in the survey, it is hard for SFMTA to know if it has actually reached underserved communities in its outreach. Therefore, in order to hear from communities of color and low-income communities, the city should extend its outreach to these communities, which the city has stated it will do for the next phases.

However, as mentioned in the literature review, Slow Streets may not be the best solution for street safety for all neighborhoods. Instead of conducting outreach about how to implement Slow Streets in underserved neighborhoods, the city should hear more about what these neighborhoods need for their own health and safety on local streets. Furthermore, research has demonstrated that citizens participate more actively in civic engagement when it is conducted through communication infrastructure. Communication infrastructure is defined as "a neighborhood storytelling network," which consists of neighborhood sites that promote these activities such as parks, libraries, schools etc. (Kim & Ball-Rokeach, 2006). In conducting the survey, SFMTA did not conduct this type of outreach to San Francisco neighborhoods, and it, therefore, makes sense that certain neighborhoods were missing from the responses entirely. To improve on its past methodology, the city should leverage past research about successful civic engagement and encourage participatory involvement from San Francisco neighborhoods in the future of their community.

Email Analysis

Based on the email sample, it is clear that many San Franciscans are in favor of the Slow Streets program. Even most emails complaining about missing signage or traffic safety still approved of the program in general. About a quarter of the emails were against Slow Streets, which comes close to SFMTA's assessment of an 80% approval rating (Barnett, 2020b). If SFMTA is hoping to perform outreach to citizens not in favor of the program, it should focus on vehicle access and traffic-related concerns, which were the most common of the non-supportive complaints.

Among those in favor of Slow Streets, the most common concerns were increasing access to the Tenderloin, missing signage/barricades and traffic safety. Therefore, the city can focus its outreach and communication efforts on signage and equitable access to Slow Streets. In terms of traffic safety and signage, the city can work on traffic calming measures and improved signage to ensure that people feel safe along Slow Streets.

When considering equitable access, the Tenderloin mass email demonstrates that many in San Francisco care about Slow Streets becoming widespread not just in wealthy and White neighborhoods, but also neighborhoods with low-income populations and people of color. While the Tenderloin has been one of the most publicly discussed neighborhoods not to receive Slow Streets, there are other neighborhoods in the city whose pandemic needs have also not been recognized with the Slow Streets program. As the spatial analysis showed, many of the neighborhoods in the southern regions of the city are also missing from the dialog about Slow Streets. SFMTA has indicated that it will focus on these neighborhoods in its future outreach for the next phase of Slow Streets. However, many of the emails about the Tenderloin came from people who did not live in the Tenderloin themselves (42% as mentioned earlier). It will be critical for SFMTA to ensure that its efforts to bring in voices not as represented in its initial outreach actually represent the communities that the city is trying to hear from.

Policy Recommendations and Conclusions

Policy Recommendations

Given my findings, I suggest a few recommendations for the future phases of SFMTA's outreach and communication efforts. These recommendations focus on areas in which I observed priorities for citizens as well as gaps both in terms of citizen understanding and in terms of underrepresentation of neighborhoods and communities in the city.

1. **Finetune messaging around the program's function.**

   Many citizens who responded to the Slow Streets questionnaire did not recommend Slow Streets in corridors that fit the Slow Streets criteria. Often, residents opted for streets that were essential public transit or commercial corridors within a neighborhood. Perhaps, these streets are the most identifiable in a neighborhood and are therefore the quickest to come to mind for a recommendation. It also could be that citizens are confusing Slow Streets with Shared Spaces, another program that institutes partial or full street closures for retail and dining. If SFMTA is interested in learning more about where the confusion comes from, it could perform further outreach and research to understand more about how its messaging has not clarified these distinctions.

   In the meantime, in its general future outreach, the city should prioritize messaging that Slow Streets are for residential corridors. Additionally, the program centers around mobility within a neighborhood. In addition to maintaining a bulleted list of criteria on its website, the city can demonstrate the function and purpose of a Slow Street in the signage on Slow Streets themselves. Instead of mentioning all criteria, the city can fine tune its messaging on the residential focus of the program.

   In addition, slope was not a serious concern in recommendations, except in neighborhoods where the majority of the streets were steep. In future outreach to these neighborhoods, SFMTA should consider other ways to collaborate with these communities to find the best option for mobility given that Slow Streets are not feasible on steep corridors.

2. **Create more protocols for maintaining traffic safety within the Slow Streets.**

   In the email analysis, one of the most prominent complaint categories dealt with traffic safety and missing signage. Many residents are enjoying the program, but are concerned about the presence of cars in the roads. In order to ensure more adherence to the Slow Streets protocols, the city should ensure that signage is prominently displayed at every Slow Streets corner. Additionally, it could be helpful to create more permanent signage, as SFMTA has started to do on some of its Slow Streets (see **Figure 13**). However, even the current signage is hard to read from a vehicle. As the program becomes more permanent, the city could install signs alongside the road that are more visible for drivers and provide better instructions for detouring. With a long-term program, the city could also consider more permanent traffic calming measures like speed bumps or installing traffic circles at intersections where Slow Streets begin.

   It is important to note that improved traffic safety does not necessarily mean stricter enforcement. As research has shown, traffic enforcement through policing has a disproportionate harm on Black drivers (Seo, 2019). This enforcement, in turn, creates an unsafe environment, particularly for Black community members, which is the opposite of the original goal of safer roads. Therefore, as Slow Streets become permanent fixtures in San Francisco, SFMTA should not rely on police power to enforce the program's function. Instead, the city should continue to focus on less invasive efforts like signage and outreach.

Figure 13. Permanent Slow Streets Signage

Source: SFMTA

3. **Prioritize future outreach to underrepresented communities in San Francisco.**

In terms of the representation of recommendations and zip codes of survey participants, the sample in the questionnaire was only a subset of the San Francisco population. Most of the areas represented had a strong presence or absolute majority of wealthy and/or White populations. For future phases, SFMTA should prioritize outreach to communities of color and low-income populations, given that the city cannot be certain that it heard from these populations in its prior outreach.

For its next phase of Slow Streets, SFMTA has identified target neighborhoods (Barnett, 2020a) that have not been as well represented in past outreach. Many of these neighborhoods overlap with the southern areas of the city that this capstone identified as underrepresented in the overall survey. SFMTA's acknowledgement that it should focus on hearing voices from neighborhoods previously left out of outreach and communication efforts and its subsequent plan to involve these neighborhoods is a positive step and will directly help with making the program more equitable in the future.

However, instead of conducting outreach that is entirely online and through the SFMTA itself, the agency should implement methods proven

to encourage civic engagement within neighborhood networks. Based on past research, this outreach should be centered around the "communication infrastructure" within the neighborhoods, which will encourage residents to share their stories within a common space in their communities (Ball-Rokeach and Kim, 2006). The city should partner with neighborhood institutions such as libraries, religious institutions or other community spaces to encourage civic partnership around Slow Streets in settings that are more conducive to sharing. While this type of outreach was challenging at the start of the Slow Streets program during shelter-in-place, as San Francisco starts to reopen, the city can extend its outreach in ways it was not able to before.

Furthermore, the city has focused its outreach on how to implement Slow Streets in these neighborhoods. As the literature review highlighted, critics of Slow Streets have asked that cities consider other safety priorities for communities of color—such as environmental factors or incidents of police brutality that contribute to disproportionate harm to Black and Brown communities (Thomas, 2020). SFMTA could better serve these communities if it asks them what mobility, safety and health needs they have during the pandemic and beyond. It's possible that Slow Streets are not as urgent for some communities as other health needs. In conducting Slow Streets outreach, the focus should be on collaborating and listening, rather than figuring out how to implement a program before considering other options.

Conclusion

After being in place for a year, Slow Streets programs around the world have demonstrated alternative ways for cities to think about street design. In San Francisco, overnight, citizens woke up to corridors designed entirely for those without cars. Based on this capstone and other research from SFMTA, those who have been surveyed are overwhelmingly in favor of this program. With majority support, Slow Streets have an opening to become a permanent staple in the mobility routines of urbanites around the globe.

However, given that the San Francisco program was created quickly in response to an emergency need, there is still work to be done. Many San Franciscans may be in favor of the program, but they still don't quite understand its function. Even those who are in favor may also have some hesitancy about traffic safety and roaming Slow Streets. Most importantly, the quick outreach SFMTA

conducted left out critical voices from low-income areas and neighborhoods with large populations of communities of color.

For this program to truly succeed, the city should carry out a robust and thorough outreach and communication plan and fine tune its messaging to focus on where San Franciscans are confused about the program's function. Given that this project demonstrates that outreach done without intentional community involvement often leaves out the most marginalized voices, the city should continue its deliberate outreach to communities of color in the city. If the agency cannot design a program that adapts to fit the needs of each neighborhood in the city, it will need to reimagine how it defines safe streets, and do so thoughtfully and respectfully.

References

Anonymous. (2020a). *20th street " not so slow street"* [Personal communication].

Anonymous. (2020b). *Clay street slow street* [Personal communication].

Anonymous. (2020c). *Please Support Slow Streets* [Personal communication].

Anonymous. (2020d). *RE: Slow Street Request Funston Ave (Between Geary and Anza)* [Personal communication].

Anonymous. (2020e). *West Pacific Ave Adjacent to Presidio Wall Playground* [Personal communication].

Barnett, B. (2020a, April 22). *Slow Streets Program* [Text]. SFMTA; San Francisco Municipal Transportation Agency. https://www.sfmta.com/projects/slow-streets-program

Barnett, B. (2020b, July 16). *The Third Phase of Slow Streets Rolls Out a Network* [Text]. SFMTA; San Francisco Municipal Transportation Agency. https://www.sfmta.com/blog/third-phase-slow-streets-rolls-out-network

Bliss, L. (2020, April 17). Drivers Not Wanted on Oakland's 'Slow Streets.' *Bloomberg.Com*. https://www.bloomberg.com/news/articles/2020-04-17/how-oakland-made-pedestrian-friendly-slow-streets

Curry, M. (2020, March 18). What's Happening with Transit in California? *Streetsblog California*. https://cal.streetsblog.org/2020/03/18/whats-happening-with-transit-in-california/

Dumbaugh, E., & Gattis, J. L. (2005). Safe Streets, Livable Streets. *Journal of the American Planning Association*, *71*(3), 283–300. https://doi.org/10.1080/01944360508976699

Florida, R. (2011, June 22). *America's Top Cities for Bike Commuting: Happier, Too*. The Atlantic. https://www.theatlantic.com/national/archive/2011/06/americas-top-cities-for-bike-commuting-happier-too/240265/

Goetsch, H., & Quiros, T. P. (2020, August 7). *COVID-19 creates new momentum for cycling and walking. We can't let it go to waste!* World Bank Blogs. https://blogs.worldbank.org/transport/covid-19-creates-new-momentum-cycling-and-walking-we-cant-let-it-go-waste

Golden Gate Park Slow Streets | San Francisco Recreation and Parks, CA. (n.d.). San Francisco Recreation and Park Department. Retrieved April 3, 2021, from https://sfrecpark.org/1538/Golden-Gate-Park-Slow-Streets

Graf, C. (2020, July 14). *Crowded neighborhoods left out of Slow Streets*. The San Francisco Examiner. https://www.sfexaminer.com/news/crowded-neighborhoods-left-out-of-slow-streets/

Hammerl, T. (2020, September 11). *City seeks new solutions for protecting Slow Streets, after drivers*. Hoodline. https://hoodline.com/2020/09/city-seeks-new-solutions-for-protecting-slow-streets-after-drivers-plow-through-signs/

Hu, W., & Salcedo, A. (2019, October 3). Cars All but Banned on One of Manhattan's Busiest Streets (Published 2019). *The New York Times*. https://www.nytimes.com/2019/10/03/nyregion/car-ban-14th-street-manhattan.html

Kim, Y.-C., & Ball-Rokeach, S. J. (2006). Civic Engagement From a Communication Infrastructure Perspective. *Communication Theory*, *16*(2), 173–197. https://doi.org/10.1111/j.1468-2885.2006.00267.x

Knight, H. (2020, September 12). *San Francisco lets just one person delay eco-friendly projects in the midst of a climate crisis. How is that fair? - SFChronicle.com*. San Francisco Chronicle. https://www.sfchronicle.com/bayarea/heatherknight/article/San-Francisco-lets-just-one-person-stop-15561164.php

Kronenberg, C. (2020, July 31). *Supporting Community Needs in the Tenderloin | SFMTA*. SFMTA. https://www.sfmta.com/blog/supporting-community-needs-tenderloin

Kuhlberg, J. A., Hipp, J. A., Eyler, A., & Chang, G. (2014). Open Streets Initiatives in the United States: Closed to Traffic, Open to Physical Activity. *Journal of Physical Activity and Health*, *11*(8), 1468–1474. https://doi.org/10.1123/jpah.2012-0376

Model Design Manual for Living Streets. (2011). http://www.modelstreetdesignmanual.com/

New York City DOT. (n.d.). *NYC DOT - Open Streets*. Retrieved November 29, 2020, from https://www1.nyc.gov/html/dot/html/pedestrians/openstreets.shtml

Oakland Slow Streets. (n.d.). City of Oakland. Retrieved November 29, 2020, from https://www.oaklandca.gov/projects/oakland-slow-streets

Pierce, P. (2020, September 2). *Shared Spaces* [Text]. SFMTA; San Francisco Municipal Transportation Agency. https://www.sfmta.com/projects/shared-spaces

Roberts, D. (2016, August 4). A *fascinating new scheme to create walkable public spaces in Barcelona*. Vox. https://www.vox.com/2016/8/4/12342806/barcelona-superblocks

Rogers, K. (2020, January 31). *San Francisco's Market Street is now car-free | CNN Travel*. CNN. https://www.cnn.com/travel/article/market-street-san-francisco-car-free-now/index.html

Rudick, R. (2020a, April 14). Eyes on the Street: A Quick Look at Oakland's 'Slow Streets.' *Streetsblog San Francisco*. https://sf.streetsblog.org/2020/04/14/eyes-on-the-street-a-quick-look-at-oaklands-slow-streets/

Rudick, R. (2020b, April 21). San Francisco Picks 12 'Slow Streets.' *Streetsblog San Francisco*. https://sf.streetsblog.org/2020/04/21/san-francisco-picks-12-slow-streets/

Rudick, R. (2020c, June 9). Tracking Slow Streets in the Bay Area. *Streetsblog San Francisco*. https://sf.streetsblog.org/2020/06/09/tracking-slow-streets-in-the-bay-area/

Rudick, R. (2020d, September 29). Bay Area Advocates Jubilant Over Transit and Bike Project Streamlining Law. *Streetsblog San Francisco*. https://sf.streetsblog.org/2020/09/29/bay-area-advocates-jubilant-over-transit-and-bike-project-streamlining-law/

San Francisco Planning. (2018). *San Francisco Neighborhoods Socio-Economic Profiles*. 96.

Seo, S. (2019). *Policing the Open Road: How Cars Transformed American Freedom*. Harvard University Press.

Sisto, C. (2020, July 21). *After months of delay, Tenderloin community organizations escalate calls for Slow Streets*. Hoodline. https://hoodline.com/2020/07/after-months-of-delay-tenderloin-community-organizations-escalate-calls-for-slow-streets/

Stay Healthy Streets—Transportation | seattle.gov. (n.d.). Seattle Department of Transportation. Retrieved November 29, 2020, from https://www.seattle.gov/transportation/projects-and-programs/programs/stay-healthy-streets

Stehlin, J. (2015). Cycles of Investment: Bicycle Infrastructure, Gentrification, and the Restructuring of the San Francisco Bay Area. *Environment and Planning A: Economy and Space*, 47(1), 121–137. https://doi.org/10.1068/a130098p

Steinbach, R., Green, J., Datta, J., & Edwards, P. (2011). Cycling and the city: A case study of how gendered, ethnic and class identities can shape healthy transport choices. *Social Science & Medicine*, 72(7), 1123–1130. https://doi.org/10.1016/j.socscimed.2011.01.033

Thomas, D. (2020, June 8). 'Safe Streets' Are Not Safe for Black Lives. *Bloomberg.Com*. https://www.bloomberg.com/news/articles/2020-06-08/-safe-streets-are-not-safe-for-black-lives

Urban Displacement San Francisco Map | Urban Displacement Project. (2018). Urban Displacement Project. https://www.urbandisplacement.org/map/sf

Van der Zee, R. (2018, September 19). Walk the Lijnbaan: Decline and rebirth on Europe's first pedestrianised street. *The Guardian*. https://www.theguardian.com/cities/2018/sep/19/walk-lijnbaan-europe-first-pedestrian-street-rotterdam

Walk The Talk, Talk the Walk – Purplelining: Strategies That Heal – Oregon Walks. (n.d.). *Oregon Walks*. Retrieved April 14, 2021, from https://oregonwalks.org/walk-the-talk-purplelining/

Yollin, P. (2015, October 26). *S.F. Could Be Much Whiter in 25 Years, While the Rest of Region Gets More Diverse*. KQED. https://www.kqed.org/news/10500291/san-francisco-could-be-a-lot-whiter-in-25-years-predicts-a-new-profile-of-bay-area

Appendices

Appendix A: SFMTA Slow Streets Questionnaire

(Please note that an earlier version of the questionnaire included the recommendation section as a free response, while the later version separated out each recommendation and specified a format for participants to follow.)

On April 21, the SFMTA launched the Slow Streets Program to limit through traffic on certain residential streets and allow them to be used more as a shared space for foot and bicycle traffic. We would like to hear your thoughts on the Slow Streets Program.

1. Which of these describes your interest in the Slow Streets Program? *

- ❏ I live on a Slow Streets corridor
- ❏ I live in a neighborhood near a Slow Streets corridor
- ❏ I own a business near a Slow Streets corridor
- ❏ I travel along a Slow Streets corridor
- ❏ I do not live near a Slow Streets corridor, but I'd like to see one in my
- ❏ neighborhood
- ❏ Other - Write In

2. What transportation issues are important to your ability to thrive as best as possible during the covid-19 pandemic? *

- ❏ Slowing speeding traffic
- ❏ Creating safe spaces to walk, jog, bike, etc
- ❏ Supporting low cost transportation for me to get to essential locations
- ❏ Other - Write In

3. Are you in support of San Francisco Slow Streets? *

- ❏ Yes
- ❏ Somewhat
- ❏ No

4. Do you have a suggestion or suggestions for a future Slow Street? If you have no suggestions, please skip the question. You do not need to use all 5 Slow Street recommendation boxes.

Please enter responses in the correct format or your suggestion will not be considered. Please enter street names only in your responses and do not include extra information.

Format: Street Name between Street Name and Street Name
Example: ABC Street between DEF Street and GHI Street

For numbered streets, please specify between street or avenue.

Slow Street Recommendation #1 _____

Slow Street Recommendation #2 _____

Slow Street Recommendation #3 _____

Slow Street Recommendation #4 _____

Slow Street Recommendation #5 _____

5. What is your home zip code? *

6. Do you have any other comments regarding Slow Streets?

7. We may contact you for further feedback, or to provide additional updates on the Slow Streets Program. Please provide your email if you'd like to be contacted.

Appendix B: Recommendations Data Cleaning

The following is a more detailed description of my collaboration with the ITS data analyst to pull the most relevant recommendations:

SFMTA sent me a transposed copy of the responses, which broke down citizen responses by how many recommendations he/she/they made. For example, if one respondent recommended 4 future Slow Streets, it would be broken down into 4 lines.

This spreadsheet amounted to 20,000 responses. However, many of these responses were blank, not recommendations, or unusable. Therefore, the data analyst was able to employ an automatic method to pull the most legitimate recommendations from the Excel file.

After reading through a number of responses, he found that most recommendations were in the following format: "X street from Y intersection to Z intersection." He then scanned each response using a rule-based matching technique. Then, he was able to split citizen responses—when people recommended more than one—based on the main street and the two starting and ending intersection points.

Then, he geocoded each of those locations using the Google Maps geocoder. Using OSMnx, which provides the San Francisco street network, he then connected the points to one another via San Francisco streets.

This solution left me with about 4,000 segments of citizen recommendations.

Appendix C: Recommendations Random Sampling Process

In order to choose a random sample of recommendations, I started with the number of responses I was left with after the data analyst had pulled the most useful responses. I decided to pull a sample of 150 responses, as it was a sample number that would still allow me to identify patterns in the responses.

In the spreadsheet, I had about 3900 responses, so I chose every 26 segments to draw (3900/150). If the 26th segment was not valid, I went to the next one, and if that wasn't valid, I went to the one before. Many citizens recommended multiple segments, so if my random choice fell on their fourth recommendation, I made sure that I drew the segment that the citizen had suggested fourth.

If a recommendation fell outside of the borders of San Francisco, I drew it up to the San Francisco county boundary. If citizen recommendations included streets that didn't intersect, I only included it in the map if one street mentioned became another street that was valid. (For example: King Street becomes The Embarcadero, so I allowed an intersection on either as interchangeable). If a citizen recommended an entire street, I drew the segment as the entire length of the street.

In the case of an entire recommendation and its neighbors not serving as valid data, I deleted all the responses from the particular respondent and chose the segment immediately following.

Appendix D: SFMTA Email Categories

General Comments

- **Corridor recommendation**: recommendation of a future Slow Street
- **General support:** citizens expressing positive support for the program
- **Questions:** logistical questions about the program duration, activities permitted on Slow Street, etc.
- **Tenderloin-related** (added by me): mass email requesting program expansion to the Tenderloin

Complaints

- **Broken signage/barricade:** when a sign is broken or vandalized
- **Health-related:** concern about COVID-related compliance such as physical distancing, not wearing masks etc.
- **Missing signage/barricade:** reporting missing Slow Street demarcation signage
- **Parking impacts:** concern about a Slow Street reducing parking
- **Public nuisance:** concern about noise, trash, etc.
- **Survey and outreach** (added by me): concern about accessing the survey or with the outreach conducted about Slow Streets
- **Traffic-related:** concern about the traffic impact of Slow Streets such as increasing congestion
- **Traffic safety:** concern about the safety on the Slow Street for bikes and pedestrians
- **Vehicle access:** concern about not being able to access a Slow Street via a vehicle

Appendix E: Email Random Sampling Process

To produce a thorough sample of emails, I chose 141 random emails from the 1400 provided by SFMTA. I started by picking every 13 emails. If this email was invalid, I went to the next one. If I had already seen this email (and this was another response to the same email), I went to the next one. In the middle of the spreadsheet I found a large gap, which I hid, and just counted 13 from where the gap began. After I had done this process, I realized I had not produced a large enough sample, so I went back and chose every 42 in order to get to close to 140.