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Final Report: Homelessness in San Francisco

Web Map , GitHub Repository

I. Problem Description, Objectives, and Audience

For citizens of San Francisco, homelessness is an issue faced on a daily basis. The visibility of the homeless crisis in the city has increased dramatically in recent years, and statistics show that homelessness in San Francisco is steadily on the rise. The city reports that in 2019, the number of unhoused individuals was 30% greater than in 2017 (sfgov.org) . This issue reveals the inadequacy of affordable housing and accessible mental health care in the City. There are many organizations and city institutions devoted to supporting the homeless population of the city, but this information is not always easily accessible to those who need it most.

Our objective is to create a web map which will illuminate the rapid growth of the city's homeless population by providing a visual representation of homelessness in San Francisco over a one-year period (2019). The map will also provide information on the most immediately accessible resources and services for both social workers and unhoused individuals in order to ease the burden of finding assistance. There exists a stigma around homelessness which may prevent people from seeking the help they need, so it is imperative to make this information accessible in a digestible manner. This map also illuminates possible service deserts, or places where there is no easily accessible service by visualizing areas with a high count of encampments but no nearby services. This may inform the decision of city officials or other organizations when considering where a good location for a new shelter or other service may be.

The audience of this project includes citizens of San Francisco who wish to learn more about the homeless crisis, social workers who work with the homeless population and are seeking an easy way to direct people to services, and the homeless population of San Francisco seeking assistance. Citizens of San Francisco deserve easy access to information about the homeless population, as it is an issue of immediate concern to many. Social workers should have a way to easily access information about homeless services, especially if they are interacting with individuals on the street and need to know the closest place to direct them for assistance. Finally, this project could be used by the population of homeless individuals who have access to a mobile device or a device with internet access to direct them to the nearest place of service.

II. Data

SF 311 Encampment Counts 2019

Homeless Services in San Francisco

San Francisco Neighborhoods

Our primary source of data for this map was obtained from SFGov 311 calls in San Francisco. We utilized calls and mobile app reports of Encampments from January 2019 - December 2019. Fortunately, San Francisco's data exploration tool contains a robust filter which allowed us to limit the amount of duplicate cases from our dataset. This dataset allows us to get an idea of the number of unhoused individuals in San Francisco and how much that population has changed over a yearlong period. It also shows where this population is distributed geographically throughout the city, which illuminates areas in need of further outreach and services as well as ones that have adequate support. This dataset is not a perfect representation however, as there is no indication of how many people were residing in each encampment, or if an encampment from one individual was reported multiple times. Nevertheless, it is the most representational indicator of homelessness in the city we were able to access.

The second dataset we utilized in the creation of this map was a list of homeless services of different types compiled by us with internet searches. This dataset allows the map to be used as a tool for directing and seeking assistance rather than just an informational map. By incorporating data regarding the location of services relative to the homeless population, individuals seeking service can be directed to the closest location that will support their needs. This dataset is sorted by type of service so the differences in what is offered at each location will be clear by viewing the map. We identified three service categories which our data fit into: youth services, food banks/pantries, and homeless shelters. Unfortunately, the method of searching the internet for services leaves out results which may not have a high internet presence, meaning our list is not comprehensive of all the services in San Francisco.

A third dataset, also obtained from SFGov, contained a shapefile of the neighborhood boundaries of San Francisco so map users can easily identify if their neighborhood has seen an influx of encampment reports, and if there are adequate services or not to assist this population.

A. Additional Datasets

To further meet our objectives, a dataset that contains the actual number of homeless individuals and where they were counted would be very helpful, but we could not find this dataset in our searching. The current dataset used to represent the homeless population is solely based upon calls or mobile app of encampments. However, the same individual or group could be reported multiple times for an encampment, which means the number of reports on the map is not equal to the number of unhoused people in the city. Nevertheless, it is a good indication of the number. If the number of encampment reports increases, we can logically assume that the homeless population is increasing as well. More

comprehensive data for services available in the city would have been helpful as well, but we had difficulty in finding a reliable and updated list of services and their locations. Finally, we would like to incorporate a larger amount of data to further illuminate the changes over time, possibly on a 5-year or 10-year scale. Unfortunately, due to the volume of reports, these datasets are massive and difficult to handle for web mapping applications within our reach.

III. Methodology

A. Data Processing

The 311 data was first filtered on SF 311's website to remove duplicate cases or cases with any errors. After downloading the data from SF 311, it was cleaned by deleting unnecessary information, and was then uploaded to Mapbox Studio to be converted into a tileset for easier manipulation.

The data for homeless services was compiled by us and placed into a .csv. This contained the name of the service, the coordinates, the service type, a brief description, the website, and the phone number. The .csv was then uploaded to Mapbox Studio to style to our specifications.

The shapefile for San Francisco neighborhoods was also uploaded to Mapbox Studio, styled, and added to the map.

B. Data Display

From afar, the encampments are displayed as a cluster of points above the area they are concentrated in. When zooming in, the points will separate to their respective locations the closer the user gets. This allows the user to see where the homeless population in the city is most concentrated, and also areas where the city may need to focus more service efforts. This data is able to be manipulated through the

timescale, which allows the user to see how the data differs by monthly increments. By filtering the data into its respective months, users can create their own conclusions looking at trends and spatial distributions.

The services data is displayed as points with different icons depending on the service category. When clicked, they open a popup listing the name, a brief description of the organization, their phone number, and a link to their website.

The San Francisco neighborhoods data is displayed as a solid outline to allow users to easily identify their neighborhood.

IV. Issues and Challenges

We encountered multiple issues while creating the map. First, uploading the encampment data to Mapbox was difficult because it was very large. By filtering the data from SF Gov we were able to cut the dataset down and fit it into Mapbox. Another issue we encountered was making the timescale with clustered data that updates with zoom. With the use of mapbox API and examples as well as Stack OverFlow, we were able to sort out the trouble and wrap our head around it. Toward the end of the project, we ran into some CSS formatting issues for the layout of our map page. With the use of Flex Box, we were able to bring the page proportions to the right size and shape. However, the flex box property also made it difficult to implement further elements and css styles, like a filter for services, without it being hidden by the map or taking up too much room on the map itself. Lastly, the time slider works for all the clusters and their labels and colors, but the individual points on the map at full zoom do not change between months. They are all present for the entire year regardless of the particular month.

V. Sources

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