Bus Transit and On-Street Parking in San Francisco

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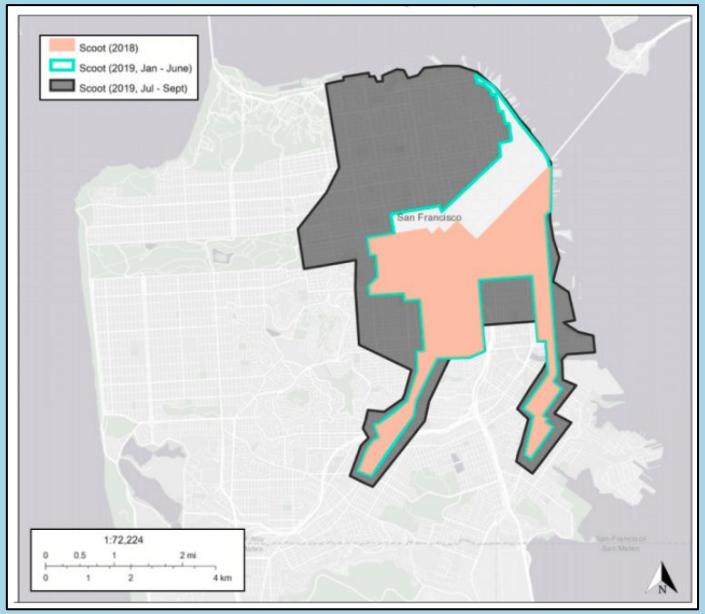
Brief Intro

-PhD Candidate, UC Berkeley.

-Research on sustainable transportation.

-San Francisco resident.



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Are shelters in place? Mapping the distribution of transit amenities via a bus-stop census of San Francisco

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ABSTRACT

Transit stops serve as crucial components of journeys for riders, but their condition is often left out of equity considerations. Two important empirical questions are what stop amenities, such as places to sit, clear signage, shelters for inclement weather, and unobstructed curbs are present, and how are they distributed across systems, which may reveal neighborhood or route-specific disparities. San Francisco, CA represents an ideal case for which to pursue this question, given it maintains a 'transit first' policy directive that mandates public space prioritize transit over private automobiles. An in-person census of 2964 street-level bus stops was conducted over three months, which finds that a majority of stops lack both seating and shelter of any kind, that route signage varies widely in format and legibility, and that roughly one third of all stops are obstructed by on-street parking, rendering them difficult to use and exposing riders to oncoming traffic. Stops in the city's northern half are more likely to feature seating, shelter, and unobstructed curbs, whereas amenity "coldspots" nearly all lie within the city's southern half. Stop amenities also vary sharply by bus route, such that routes with the longest headways (and thus waiting times) provide on average the least seating, shelter, and clear curbs. These three amenities – seating, shelter, and unobstructed curbs – are also present to a greater degree in Census tracts with higher shares of white residents. This census demonstrates that equity evaluations of transit must include stop amenities, which are often overlooked, can undermine transit's attractiveness, and even compound long-standing imbalances in service quality for underserved communities. Furthermore, studies of this kind can inform where amenity upgrades should be prioritized, targeting those areas currently lacking in high-quality stops, and raising the minimum standard of stop amenities overall. Finally, given data collected in this census is almost entirely unavailable to riders within current trip-planning and wayfinding applications, this work raises the possibility of expanding transit-data standards to include amenity details.

1. Introduction

Cities across the United States have set ambitious goals for increasing the share of trips which take place on transit, such as Boston (over 40% by 2030) and Portland (25% by 2035) ("Go Boston, 2030", 2017; "Transportation System Plan", 2018). These targets relate to manifold objectives, including reducing congestion, as well as improving air-quality and lowering carbon emissions. Indeed, transit not only moves people more efficiently in terms of space on the road, but it also requires less energy per traveler (Barrero et al., 2008; Lowe et al., 2009; Hodges, 2010). Regardless of these potential benefits, transit ridership has been falling in nearly all U.S. cities over the last decade (Amin, 2018), and dropped precipitously during the COVID-19 pandemic (Hart, 2020). For transit systems to reverse these long and short-term trends, they must provide a level of service that competes with alternatives like personal automobiles, bicycles, and walking, but also ridehailing (such as Uber and Lyft), and micromobility (shared bikes and scooters). This is particularly relevant given a number of studies on emerging modes indicate a shift away from transit (Graehler et al., (2019); Schaller, 2018).

Transit's attractiveness generally stems from the spatial extent of routes, their frequency, and fare prices. However, features such as clear signage, places to sit, shelters to provide shade and protection from inclement weather, ease in boarding and exiting vehicles (e.g. unobstructed curbs), and screens providing real-time arrival estimates are also influential. Indeed, as Portland, Oregon's TriMet agency puts it, "the public's first impression of TriMet and its services is the bus stop" (Baldwin et al., 2010). Though, cursory use of many transit systems indicates that stop amenities are often inadequate (lack of clear signage, seating, shelters, etc.) and inconsistently distributed (the number of

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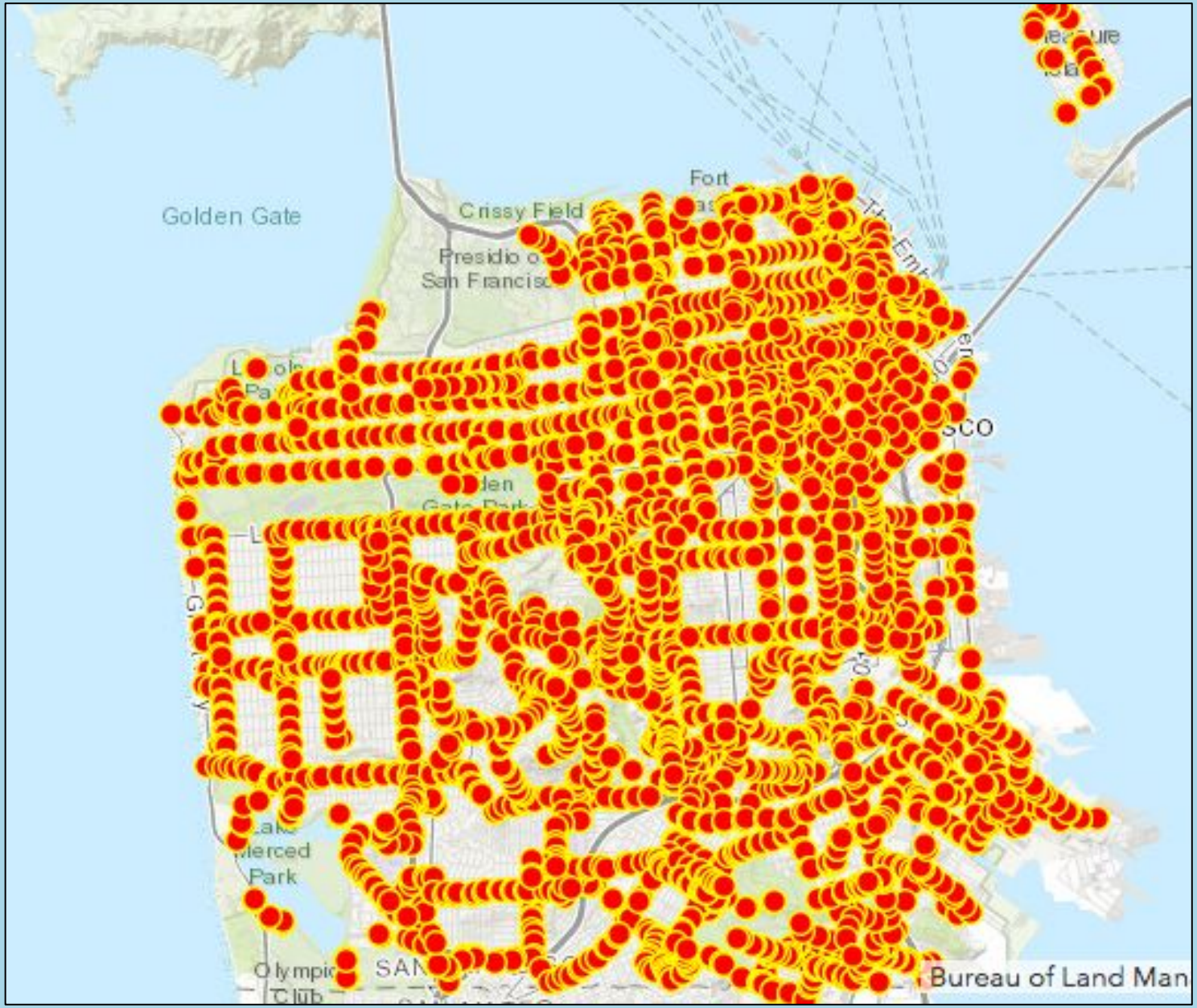
SFMTA

2. Public transit, including taxis and vanpools, is an economically and environmentally sound alternative to transportation by individual automobiles. Within San Francisco, travel by public transit, by bicycle and on foot must be an attractive alternative to travel by private automobile.

3. Decisions regarding the use of limited public street and sidewalk space shall encourage the use of public rights of way by pedestrians, bicyclists, and public transit, and shall strive to reduce traffic and improve public health and safety.

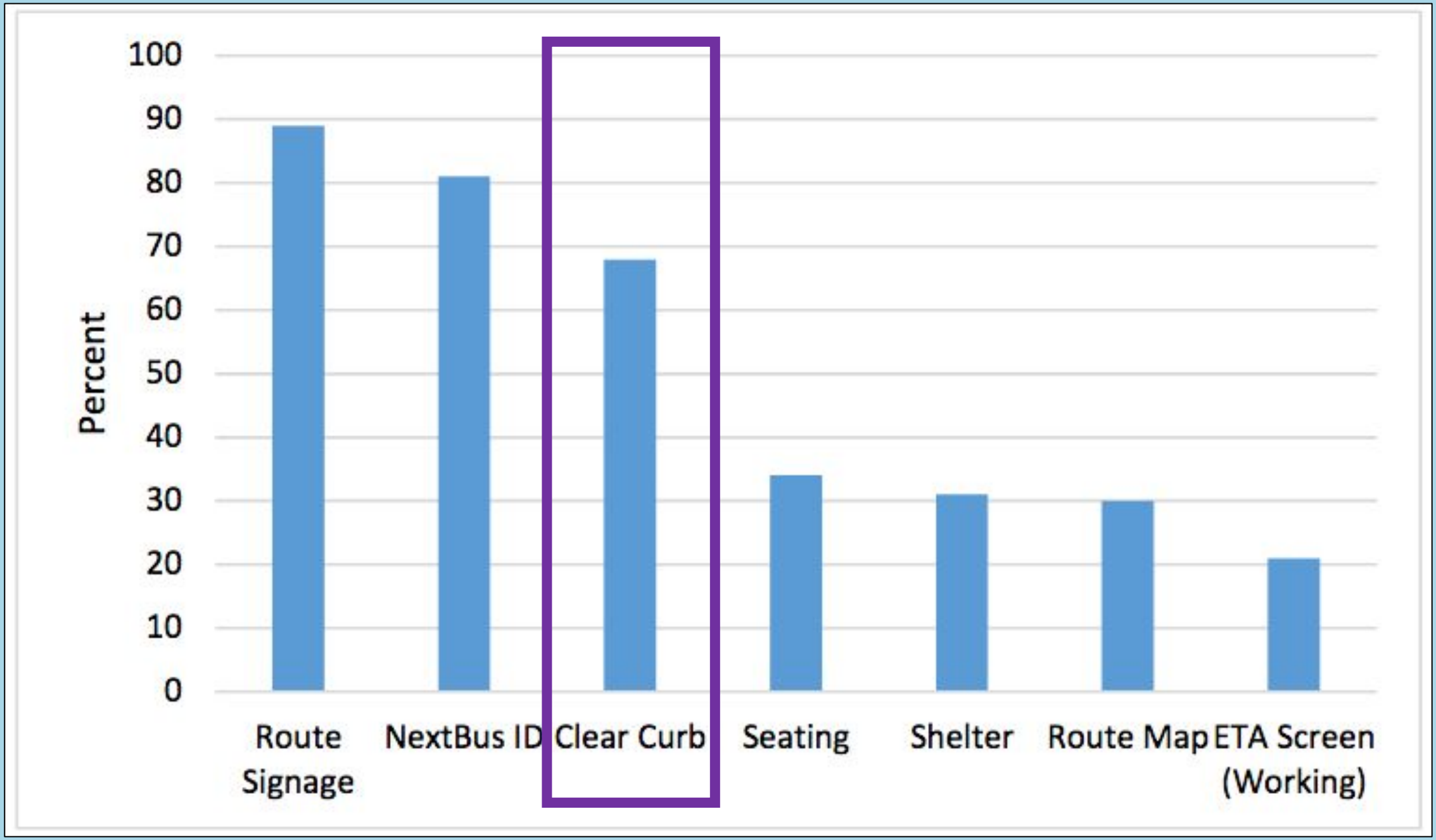
Methods

- In-person visits to every street-level bus stop in SFMTA system (~3,000).
- Excludes other transit agencies (e.g. SamTrans, AC Transit).
- Took place over months of May, June, and July, 2020


Golden Gate
Crissy Field
Fort
Presidio
San Francisco
Lake Merced Park
Olympic Club
Bureau of Land Man


Survey123
for ArcGIS (Beta)
Smarter Forms, Smarter Field Work
Go To My Surveys
Trial requires an ArcGIS Online account
Get a 60-day free trial
Asset Inspection
Inspection date:
Wednesday, November 04, 2015
Asset ID:
Photo
Action required?
Yes
No
Asset location:

2,964
Total
Stops



Seating provided at **34%** of stops.

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Curbs obstructed at at **32%** of stops

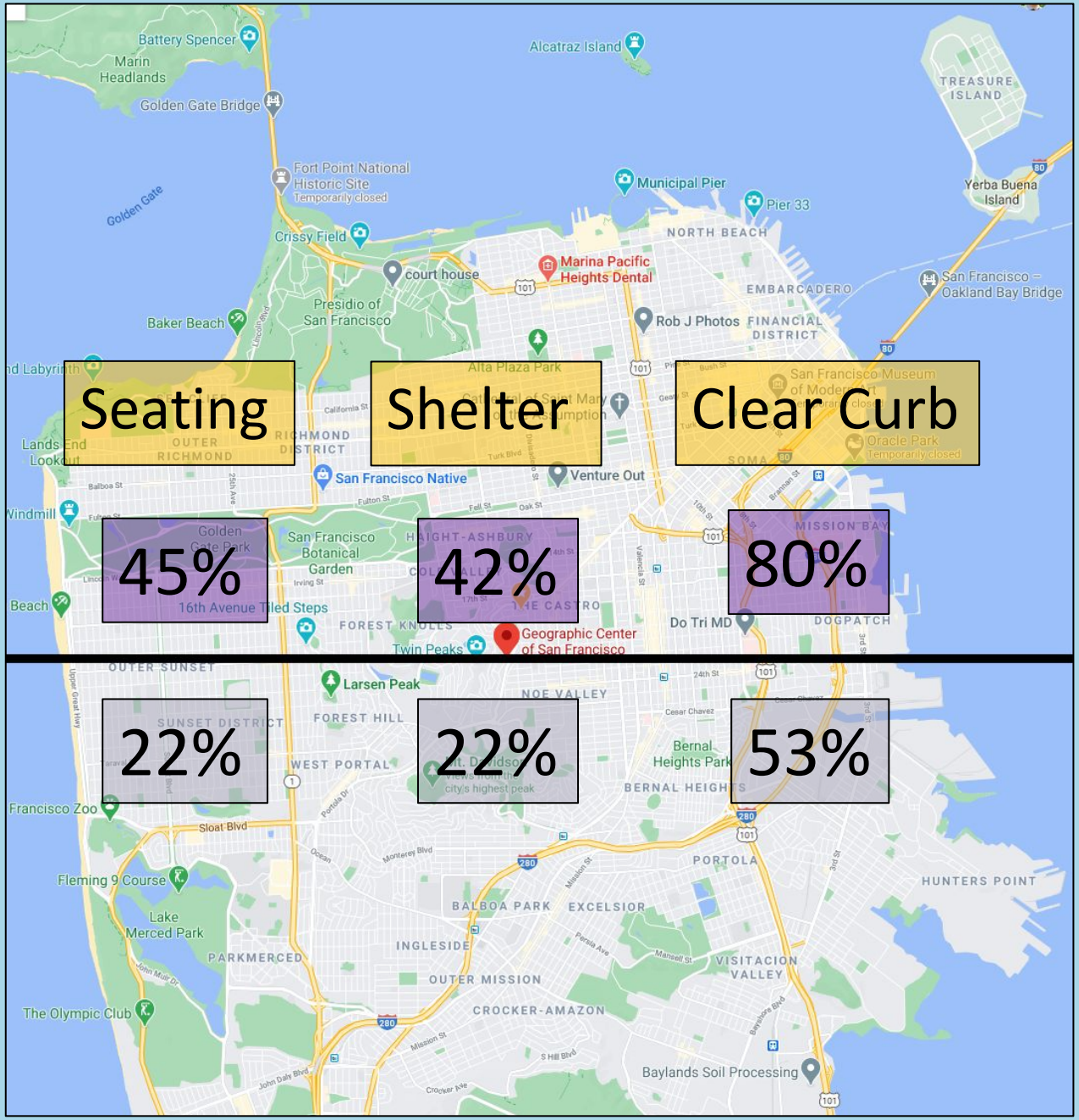

Hot Spot with 99% Confidence
Hot Spot with 95% Confidence
Hot Spot with 90% Confidence
Not Significant
Cold Spot with 90% Confidence
Cold Spot with 95% Confidence
Cold Spot with 99% Confidence
Presidio
San Francisco
Golden Gate Park
Bayview/
Hunters Point
Lake Merced
1: 72,224
0
2 km
4 km
N


7HBA447

Findings

North vs. South disparities in amenities.

These are of far higher magnitude than East vs. West comparisons (1-3% difference).



Signage Consistency and Legibility

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Other Accessibility Issues

Potrero Hill

Mission District

Nob Hill / Russian Hill

Bayview

Twin Peaks

Cole Valley


STOP
ALL WAY
NO PARKING
1ST FRIDAY
OF MONTH
8 A.M. TO 10 A.M.
STREET CLEANING
2 HOUR
PARKING
8 A.M. TO 5 P.M.
MON THRU FRI
EXCEPT VEHICLES WITH
AREA J PERMITS
Ford
HYUNDAI
69370J1
BURLINGAME

Outer Richmond