

**To:** City of Alameda Planning & Building Department, Public Works Department

**From:** Emily Clayton, Master of Public Policy Candidate, UC Berkeley

**Re: Equity Priority Mapping Tools for Identifying Socially Vulnerable Areas within Alameda**

**Executive Summary:** To support equity prioritization for transportation and climate resilience projects, the City of Alameda should use the Community Vulnerability Map developed by the San Francisco Bay Conservation & Development Commission (BCDC). This will allow for continuity of approach with previous methods used by the City of Alameda to prioritize with respect to social vulnerability while saving valuable staff time by reducing the need to develop and maintain a custom map. Furthermore, this resource provides detailed information on 35+ indicators at the census block group level, providing detailed information to support planning.

**Key Indicators to Guide Transportation & Climate Resilience Planning:** As part of the development of the City of Alameda Climate Action Resilience Plan (CARP) in 2018-2019, Sustainability & Equity Fellow Marisa Johnson created a Socially Vulnerable Areas (SVA) Index for the City of Alameda. An explanation of the importance of these indicators is available in [Appendix G](#) of the CARP. The SVA index used 2015 American Community Survey (ACS) data with 12 indicators at the block group level to identify areas with the highest social vulnerability, high social vulnerability, and moderate social vulnerability. These indicators included percent of renters, percent of children under 5, percent of very low-income residents, percent of non-US citizens, percent of households without a vehicle, percent of people with disabilities, percent of single-parent families, communities of color, percent of households with people over 65 and living alone, percent of households with limited English proficiency, percent of people without a high school degree and percent of households that are severely housing cost-burdened (spending more than 50% of income on housing).

Since the development of this tool, new census data from 2020 has become available, leading to the need to update this map. However, due to the fact that other viable, publicly accessible mapping resources exist, the City of Alameda should consider other approaches to replicating this map with new data.

**Alternatives Considered:** Based on interviews with Transportation and Public Works officials in other Bay Area cities to understand how they prioritize for equity, as well as input from City of Alameda staff members, seven alternative mapping approaches were considered. Appendix A provides a summary of the alternate map resources considered and the benefits and the trade-offs of each approach. Only the BCDC map provides a fully appropriate substitute, as it includes detailed information for all the indicators used in the original Socially Vulnerable Areas index. Appendix B shows overlapping areas within the community identified by three selected approaches.

**Recommendation:** After reviewing alternatives, the [Bay Conservation & Development Commission \(BCDC\)'s Community Vulnerability Map](#) will provide the City of Alameda with the information needed to identify communities within the city where resources should be prioritized for climate adaptation and transportation planning.

- **Purpose of the tool:** BCDC's Adapting to Rising Tides Program developed the Community Vulnerability Map tool to “better understand community vulnerability to current and future flooding due to sea-level rise and storms.” While this makes the tool ideally suited for climate adaptation planning, the majority of indicators focus on general equity issues that are highly relevant for transportation planning as they are correlated with greater reliance on public transportation systems, as well as exposure to greater traffic safety risk.
- **Data Sources:** Of all the tools available, the BCDC Community Vulnerability Map integrates the greatest number of data sources, with vulnerability indices based on American Community Survey (ACS) data. The map lists Cal Enviro Screen 4.0 data, MTC/ABAG Equity Priority Communities status, and UC Berkeley Gentrification and Displacement Project data for each block group. See Appendix A for additional information about these sources.
- **Current data:** The BCDC tool is updated approximately every two years.
- **Indicators:** All 12 indicators used in the SVA Index are available through this tool at the block level, which will allow for a detailed understanding of where need is greatest across Alameda’s 57 block groups. These indicators include percent of renters, percent of children under 5, percent of very low-income residents, percent not US Citizens, percent of households without a vehicle, percent of people with disabilities, percent of single-parent families, communities of color, percent 65+ and living alone, limited English proficiency, percent people without a high school degree and percent severely housing cost-burdened (spending more than 50% of income on housing). This tool provides the most granularity available with census data, compared with other maps that use census tract level data. It will also allow the City of Alameda to have a consistent approach to its planning over time.

**Adaptations Needed for Optimal Functionality:** While a user can click on any census block group on the map and see all indicators, the BCDC map shading is based on a composite score, making it challenging to quickly identify patterns for specific indicators, for example, identifying block groups with a high number of elderly residents or residents under 5. Therefore, a mapping tool was developed to enable a user to view individual indicators. Appendix C provides maps for each of these indicators. To ensure that this level of detailed information is available to support planning, the City of Alameda would need to update this indicator map when the BCDC releases new versions of the map. Social vulnerability indicators for the map are updated as new American Community Survey (ACS) 5-year estimates become available, approximately on an bi-annual basis.

**Changes in Equity Priority Areas:** Overall, there are limited changes between the SVA tool and the BCDC tool in terms of areas that are identified as having high or highest need for equity prioritization. The table below summarizes the differences between the census block groups identified as socially vulnerable by the SVA tool and those identified by the BCDC tool. Appendix E provides additional details on changes by block level.

<b>Degree of Change</b>	<b>Count of Block Groups</b>
Decrease Priority 1 Level	11
Decrease Priority 2 Levels	3
Decrease Priority 3 Levels	1
Increase Priority 1 Level	3
Increase Priority 2 Levels	1
No change	8
<b>Grand Total</b>	<b>27</b>

## Appendix A: Alternatives Considered

Map	Benefits	Tradeoffs
<p><a href="#">Status Quo: CARP Social Vulnerability Index (SVI)</a> See Appendix G p 55-67</p>	<ul style="list-style-type: none"> <li>✓ 12 indicators measured at the census block group level: Percent of renters, Percent of children under 5, percent of very low-income residents, percent not US citizens, percent of households without a vehicle, percent of people with disabilities, percent of single-parent families, communities of color, percent of people 65+ and living alone, percent of households with limited English proficiency, percent of people without a high school degree and percent severely housing cost-burdened (spending more than 50% of income on housing)</li> </ul>	<ul style="list-style-type: none"> <li>● Manual process to maintain custom map</li> </ul>
<p><a href="#">San Francisco Bay Conservation &amp; Development Commission (BCDC) – Community Vulnerability Mapping Tool</a></p> <p><a href="#">Methodology</a> and <a href="#">Detailed Appendix</a></p> <p><a href="#">BCDC Indicators Map</a> - To display each indicator, use the Layers feature on the left-hand side of the screen to display each indicator. - For optimal functioning, it is best to open this map in Google Chrome, as it may not work on Firefox or other browsers.</p>	<ul style="list-style-type: none"> <li>✓ Tracks the same 12 indicators as the status quo approach (see above)</li> <li>✓ Information at census block group level</li> <li>✓ Updated consistently</li> </ul>	<ul style="list-style-type: none"> <li>● Shows block groups by composite score across all indicators – requires customization to see indicators on their own (e.g. to identify areas with the most people over 65, etc.)</li> </ul>
<p><a href="#">Metropolitan Transportation Commission (MTC) – Equity Priority Communities</a></p>	<ul style="list-style-type: none"> <li>✓ Includes 8 indicators from status quo approach: people of color, low-income, poverty level, level of English proficiency, seniors 75 and older, households without a vehicle, single parent households, people with a disability, rent- burdened households</li> <li>✓ High threshold for tract to qualify as disadvantaged means that the tool identifies areas with the greatest needs</li> </ul>	<ul style="list-style-type: none"> <li>● Tract level data</li> <li>● Few areas identified → Harder to prioritize areas of relative need within the City of Alameda</li> </ul>
<p><a href="#">Cal Enviro Screen 4.0</a></p>	<ul style="list-style-type: none"> <li>✓ Identify areas where environmental injustice</li> </ul>	<ul style="list-style-type: none"> <li>● Based on exposure levels rather</li> </ul>

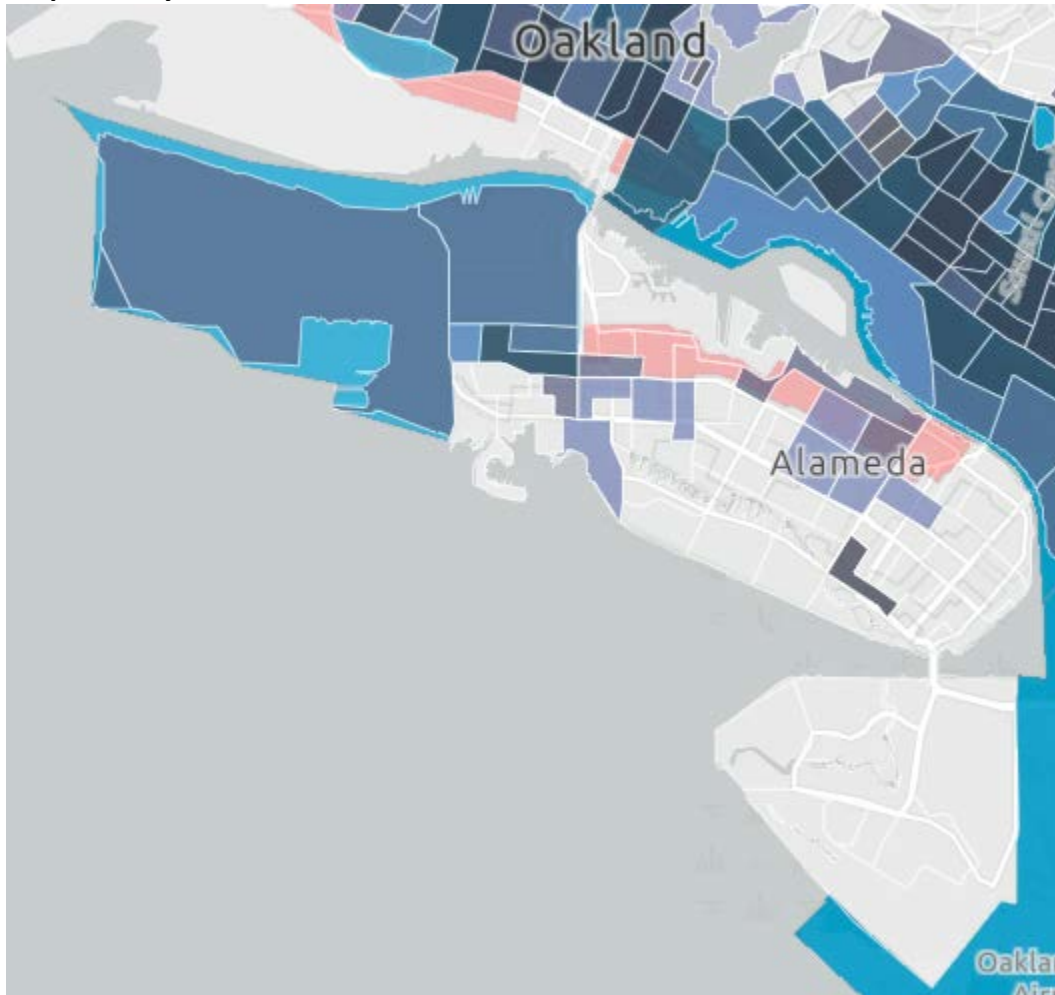
	<p>&amp; pollution burdens are greatest (PM 2.5, diesel particulate, waste, threats to water, etc.)</p> <p>✓ Separate maps are available by indicator</p>	<p>than demographics</p> <ul style="list-style-type: none"> <li>• Does not include any indicators from Table 5</li> </ul>
<p><a href="#">Council on Environmental Quality (CEQ)- Climate and Economic Justice Screening Tool– part of Justice 40 Initiative</a></p>	<p>✓ Based off national data set – may be used as basis for federal funding</p> <p>✓ Unique indicators such as climate change, clean energy/energy efficiency, clean transit, sustainable housing, legacy pollution, clean water/waste infrastructure, health burdens, workforce development</p>	<ul style="list-style-type: none"> <li>• No areas within Alameda identified</li> <li>• Politically vulnerable – as a key Biden administration initiative, may not be maintained future changes in administration</li> </ul>
<p><a href="#">US Department of Transportation – Transportation Disadvantaged Census Tracts</a></p>	<p>✓ Identifies areas based on transportation access disadvantage (communities that spend more and longer to get where they need to go), health disadvantage, environmental disadvantage, economic disadvantage, resilience disadvantage (vulnerable to hazards caused by climate change), social disadvantage</p> <p>✓ Based off national data sets – may be used as basis for federal funding</p>	<ul style="list-style-type: none"> <li>• Nearly all of Alameda included- hard to prioritize within city</li> <li>• Tract level data</li> <li>• Currently in beta mode</li> <li>• Politically vulnerable – as a key Biden administration initiative, may not be maintained with future changes in the administration</li> </ul>
<p><a href="#">University of California Berkeley Gentrification &amp; Displacement Project Map</a></p>	<p>✓ Identifies characteristics of census blocks according to the likelihood for low-income residents to be displaced due to housing costs and neighborhood change</p>	<ul style="list-style-type: none"> <li>• Indexes housing costs &amp; demographic change but does not provide granular detail on needs of those present in each tract</li> </ul>
<p><a href="#">Homeowner’s Loan Corporation 1937 Redlining Map</a> (see Oakland)</p>	<p>✓ Identifies areas that historically have received less investment due to structural racism</p>	<ul style="list-style-type: none"> <li>• Lack of alignment to some degree with areas identified as having high social vulnerability by other maps</li> </ul>

**Additional resources**

- [Justice 40 Initiative- United States Department of Transportation](#)
- [San Francisco’s Approach to Equity Mapping](#)
- [Oakland Equity Toolkit](#)

**Appendix B: Overlapping Areas between Three Equity Map Approaches**

## Map Overlay



**Purple:** BCDC Map- shading indicates relative level of vulnerability

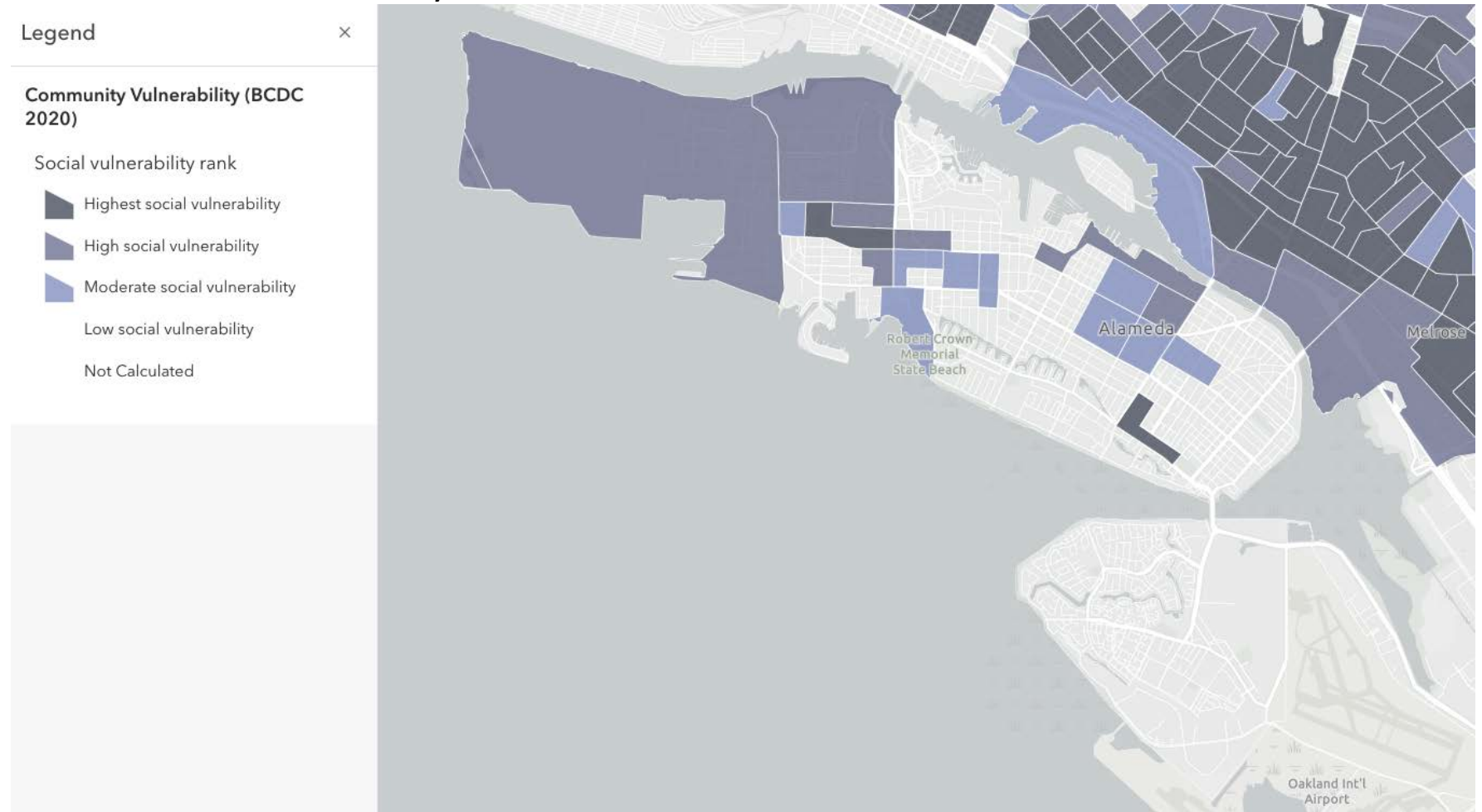
**Blue:** MTC Equity Priority Areas

**Red:** Formerly redlined areas with "Hazardous Rating"

- [Link to original map:](#) For optimal functioning, it is best to open this map in Google Chrome, as it may not work on Firefox or other browsers.

## Appendix C: Maps for Individual BCDC Indicators

### Overview: Levels of Social Vulnerability



## Renter Occupied Households

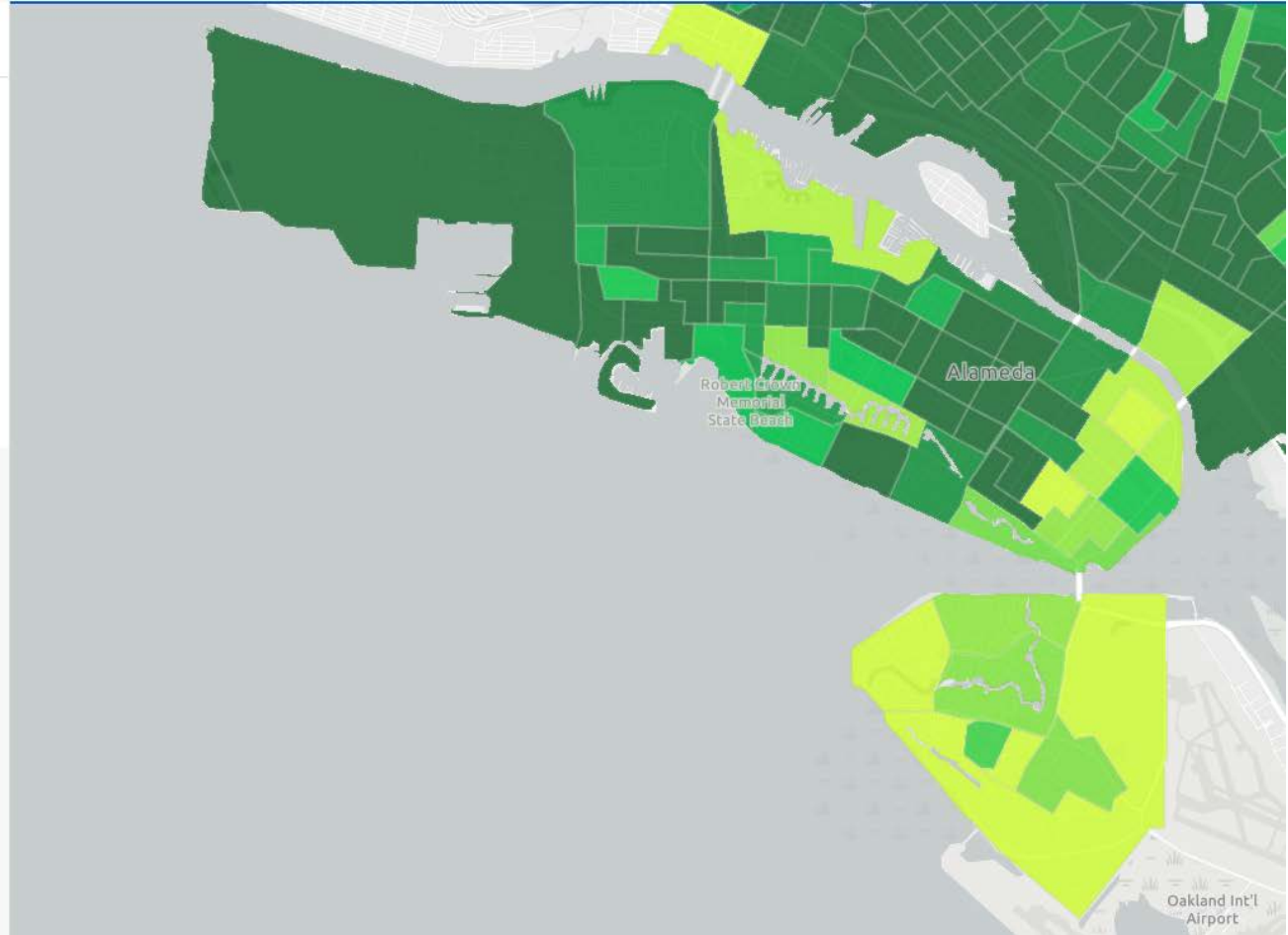
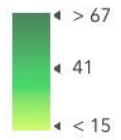
Legend



% Renters



Renter occupied households percentage





## Transit-Dependent Households

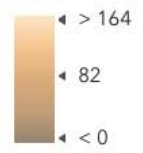
Legend



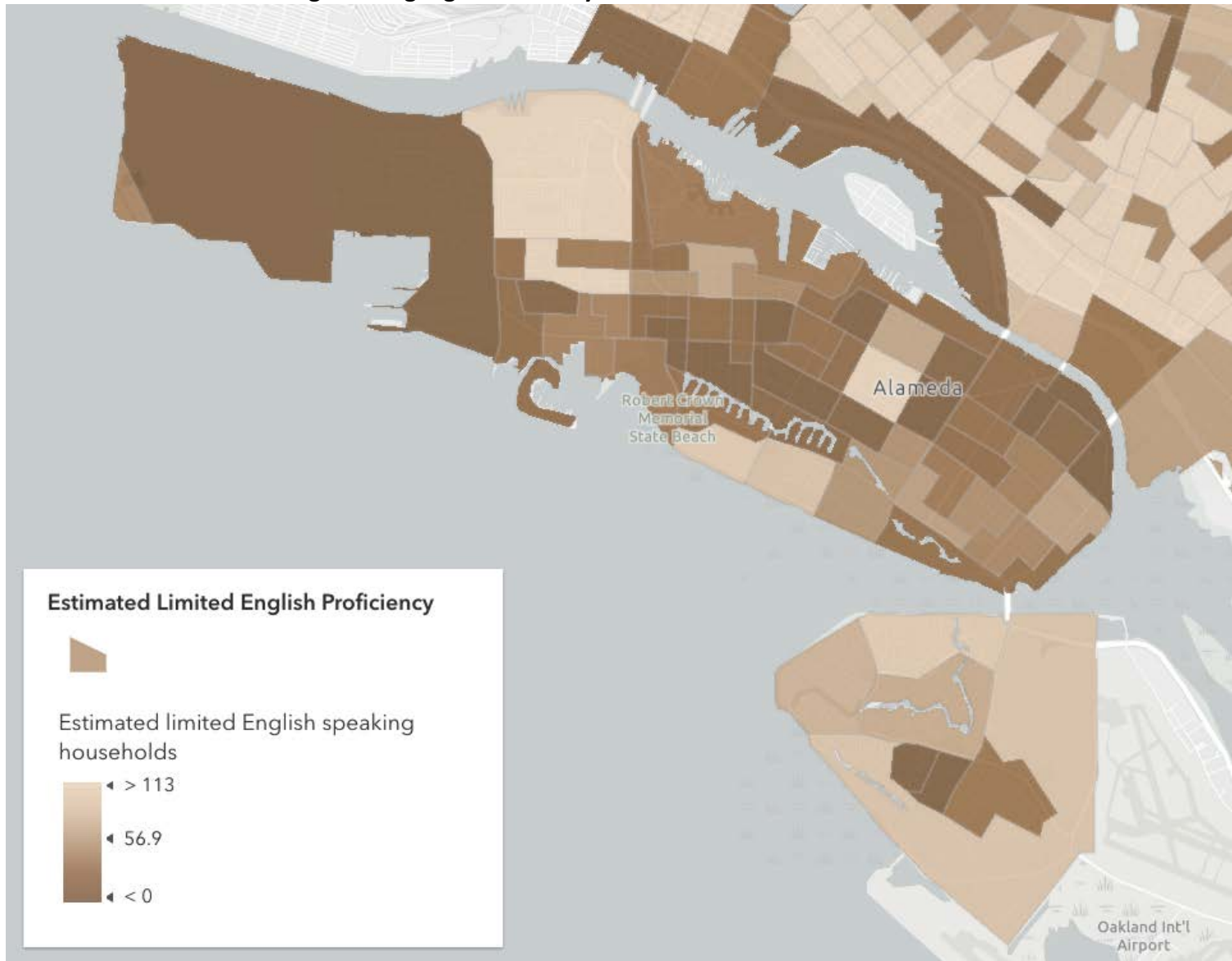
Estimated Households without a Vehicle



Estimated households without a vehicle



## Households with Limited English-Language Proficiency



## Income: Estimated Households under 200% AMI

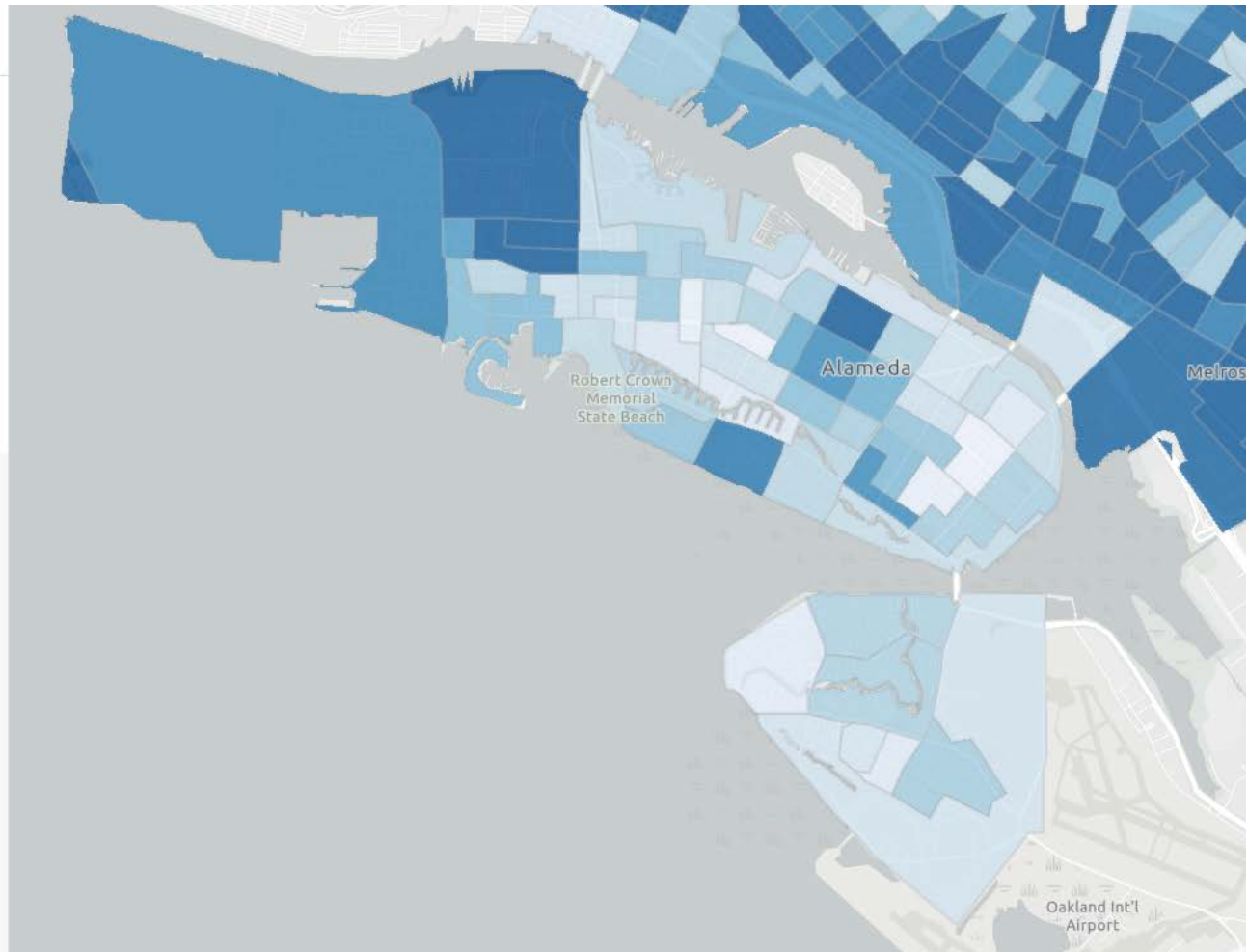
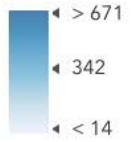
Legend



Estimated 200% Poverty Level



Estimated population under 200 pct poverty level



# Estimated Population Under 10

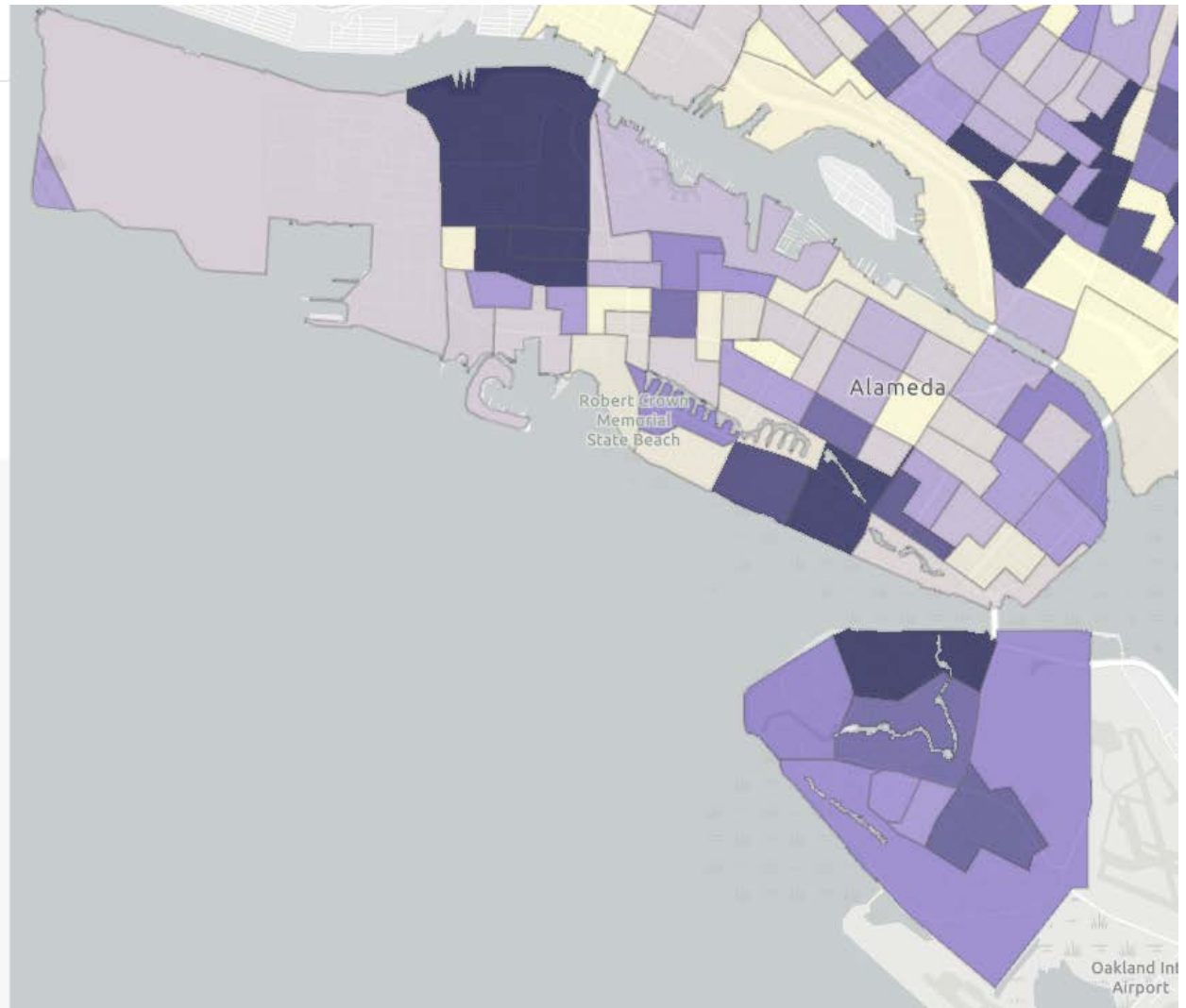
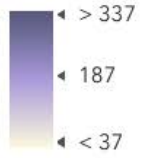
Legend



## Estimated Population Under 10



Estimate population under 10



## Estimated Population Over 65 Living Alone

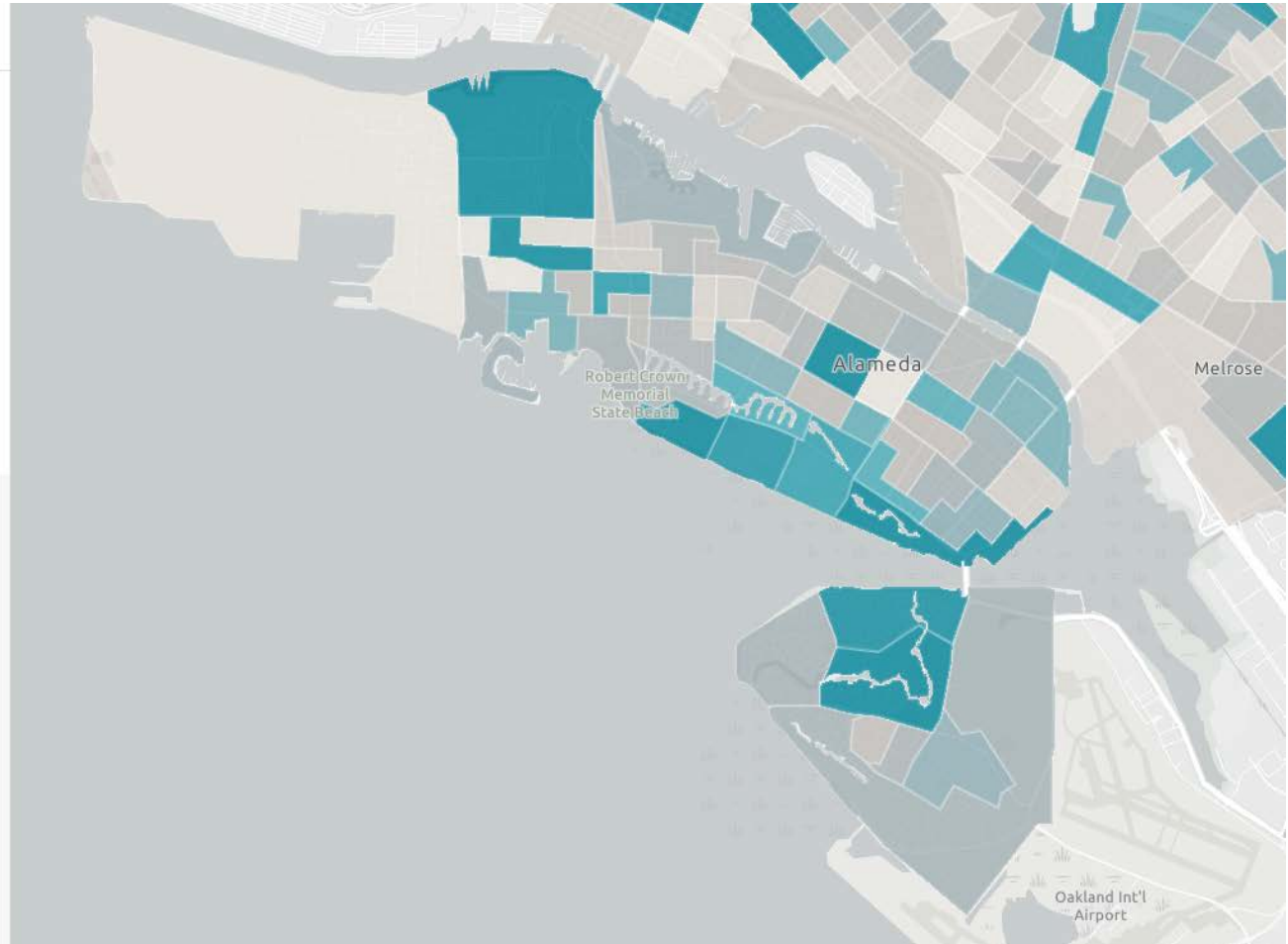
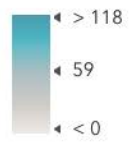
Legend



Estimated Households over 65 Living Alone



Estimated over 65 who live alone households



**Appendix D: Changes between the SVA Index and BCDC Tool**

For both the Socially Vulnerable Areas Index and the BCDC tool, the same threshold is used to classify a census block group as having highest, high, or moderate social vulnerability.

- Highest:
  - 8 or more indicators in the 70<sup>th</sup> percentile or 6 or more in the 90<sup>th</sup> percentile
- High:
  - 6-7 in the 70<sup>th</sup> percentile or 4- 5 in the 90<sup>th</sup> percentile
- Moderate:
  - 4-5 in the 70<sup>th</sup> percentile or 3 in the 90<sup>th</sup> percentile

**Summary of Block Groups Identified by Both Approaches**

**BCDC Community Vulnerability Map**

- 8 block groups at highest or high vulnerability

Level of Priority	Census Block Group	Total Block Groups
Highest	427600-2, 428200-3	2
High	428700-2, 428700-1, 427600-1, 427300-4, 427200-4, 427200-1	6
Moderate	427600-3, 428600-2, 427800-4, 427800-5, 427800-1, 427200-2, 428000-2, 428000-1, 428100-4	9
Low	All other block groups not identified above.	40

**Social Vulnerability Index (Status Quo)**

- 13 block groups at highest or high vulnerability

Level of Priority	Census Block Group	Total Block Groups
Highest	427600-3, 427600-2, 427600-1,427300-5, 427300-4	5
High	428700-2,428700-1, 428600-2, 428200-3, 428100-4, 427200-4, 427300-1, 427900-4	8
Moderate	427700-1, 427800-4, 427800-5,427900-2,428500-1,428400-1, 428200-3, 428200-4, 428200-1	9
Low	All other block groups not identified above.	35

### Ranking for each Block Group based on the Two Approaches

Block Group	SVA Tool Rating	BCDC Tool Rating
427200-1	Low	High
427200-2	Low	Moderate
427200-4	High	High
427300-1	High	Low
427300-4	High	High
427300-5	Highest	Low
427600-1	High	High
427600-2	Highest	Highest
427600-3	Highest	Moderate
427700-1	Moderate	Low
427800-1	Low	Moderate
427800-4	Moderate	Moderate
427800-5	Moderate	Moderate
427900-2	Moderate	Low
427900-4	High	Low
428000-1	Low	Moderate
428000-2	Low	Moderate
428100-4	High	Moderate
428200-1	Moderate	Low
428200-3	High	Highest
428200-3	Moderate	Low
428200-4	Moderate	Low
428400-1	Moderate	Low
428500-1	Moderate	Low
428600-2	High	Moderate
428700-1	High	High
428700-2	High	High