Short title: Walkable Distance to High Quality Public Transit
Full Title: Percent of population residing within ½ mile of a major transit stop

1. **Healthy Community Framework:** Meets basic needs of all

2. **What is our aspirational goal:** Safe, sustainable, accessible and affordable transportation options

3. **Why is this important to health?**

   Significance and health connection

   A strong and sustainable transportation system supports safe, reliable, and affordable transportation opportunities for walking, bicycling, and public transit, and helps reduce health inequities by providing more opportunities for access to healthy food, jobs, health care, education, and other essential services. Active and public transportation promote health by enabling individuals to increase their level of physical activity, potentially reducing the risk of heart disease and obesity, improving mental health, and lowering blood pressure. Further, the transition from automobile-focused transport to public and active transport offers environmental health benefits, including reductions in air pollution, greenhouse gases and noise pollution, and leads to greater overall safety in transportation. Compared to public transit, a higher portion of trips by automobiles are associated with traffic accidents and increased air pollution, which are linked to increased rates of respiratory illness and heart disease.

   Summary of evidence

   Individuals who live close to transit are more likely to be transit users and drive their cars less than people residing far from transit. Increased access to active and public transit is associated with increases in physical activity, which reduces risks of chronic disease and obesity.

   Key References
   - Ewing R, Cervero R. Travel and the built environment: A meta-analysis. *JAPA* 2010; 76(3): 265-294.
   - Frank LD, Andresen M, Schmid T. Obesity relationships with community design, physical activity, and time spent in cars. *Am J Prev Med* 2004; 27(2): 87-96.
   - Besser LM, Dannenberg AL. Walking to public transit: Steps to help meet physical activity recommendations. *Am J Prev Med* 2005; 29(4): 273-280.
   - Centers for Disease Control and Prevention. *CDC Recommendations for Improving Health through Transportation Policy*. National Center for Environmental Health. 2008.

4. **What is the indicator?**

   Detailed definition: Percent of population residing within ½ mile of bus/rail/ferry stop whose headway (waiting time) is less than 15 minutes during peak commute hours.
   - Stratification: Race/Ethnicity (8 U.S. Census groups)

Data Description

- Data Sources: 2012 Transit Stops from the San Diego Association of Governments (www.sandag.org/), the Southern California Association of Governments (www.scag.ca.gov), and the Metropolitan Transportation Commission (www.mtc.ca.gov) ; 2008 Transit Stops from the Sacramento Council of Governments (www.sacog.org); 2010 block-level population data by race and ethnicity from the U.S. Census Bureau (provided by California State Data Center at the California Department of Finance)
- Years available: 2012 (2008 for SACOG region)
- Updated: decennially
- Geographies available: census tracts, cities/towns, counties, and region for the 6-county SCAG region (Imperial, Los Angeles, Orange, Riverside, San Bernardino, and Ventura), San Diego County, 3-county SACOG region (Placer, Sacramento, and Yolo), and 9-county Bay Area MTC region (Alameda, Contra Costa, Marin, Napa, San Francisco, San Mateo, Santa Clara, Solano, Sonoma)

Transit stops included those served by one or more fixed route transit service with a frequency of 15 minutes or less during peak hours (6-9AM, 3-6PM). For the SCAG and MTC regions, stops with multiple routes whose average frequency was 15 minutes or less were included (e.g. 2 different bus routes with 30 minute frequencies each). Geospatial software (ArcMAP 10.1) was used to identify census blocks with centroids inside ½ mile buffers of the transit stops. Block-level 2010 Census redistricting data (100% counts by race/ethnicity) was merged with blocks inside the transit access area, and population counts were aggregated by census tract, city/town, county, and region. For each geography level and race/ethnicity strata, rates of transit access were calculated. Standard errors, relative standard errors, and 95% upper and lower confidence intervals, and decile rankings for cities and census tracts were calculated.
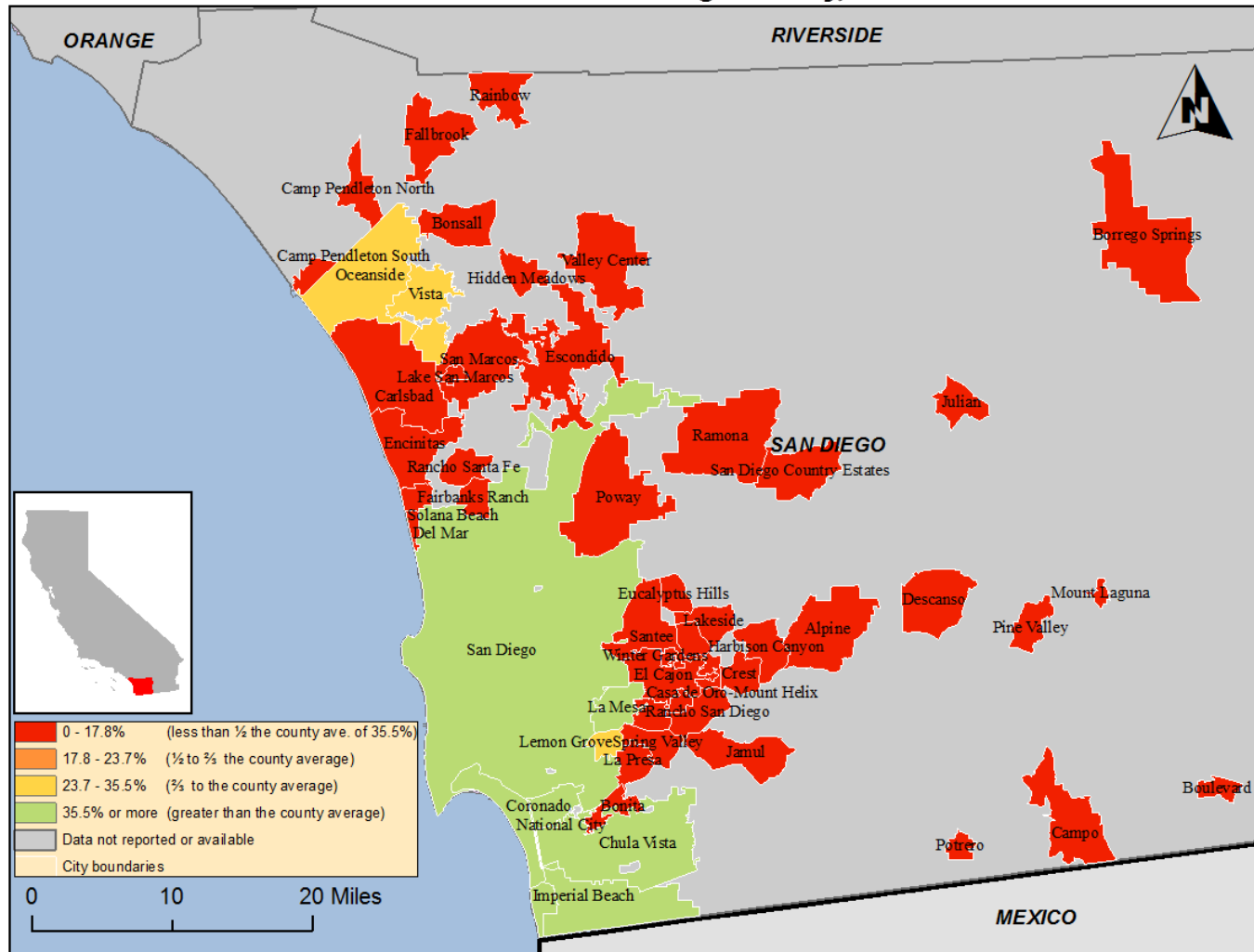
5. **Strengths and limitations**

Transit stops and service are subject to change and this analysis may not reflect recent changes. Census blocks are designated as inside or outside of transit buffers based on block centroids, which may result in small under- or overestimates of the population within buffer areas. The population data are from a slighter earlier time period (2010) than the transit data (2012), which may introduce a small error if the population numbers or demographics have changed. This indicator measures geographic access; however, other characteristics of public transit, such as affordability and personal safety (e.g. crime), also impact transit use.

6. **Projects using this indicator**

The definition of this indicator was crafted to be consistent with the definition of a transit priority project in 2008 California legislation known as SB375 or the Sustainable Communities Strategy §21155 (b)(3).
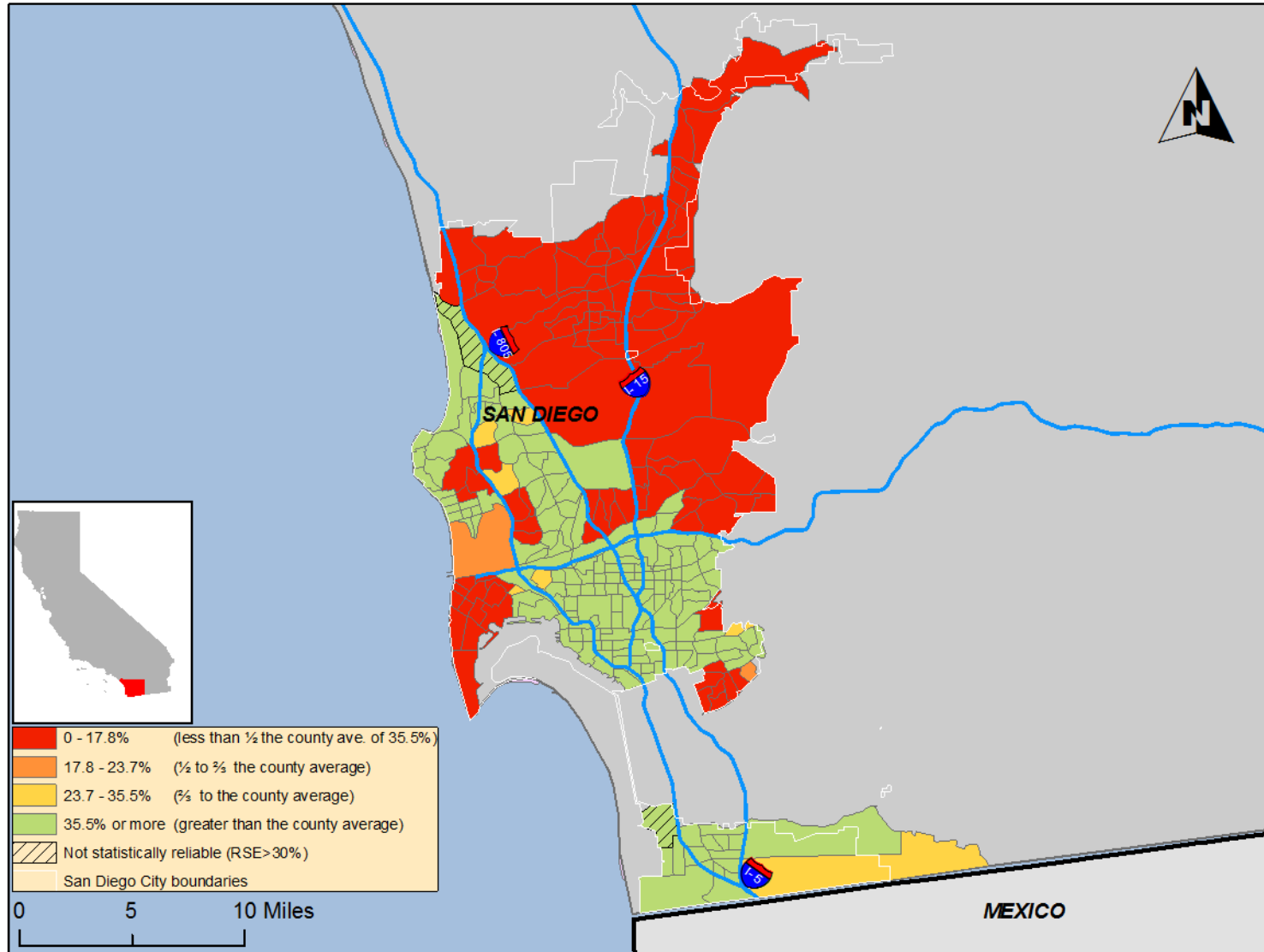
Examples of Maps, Figures, and Tables

Map 1. Percent of Residents within a Half-Mile of a Major Transit Stop*, Cities and Towns in San Diego County, 2012

Legend:
- 0 - 17.8%   (less than ½ the county ave. of 35.5%)
- 17.8 - 23.7%   (½ to ⅔ the county average)
- 23.7 - 35.5%   (⅔ to the county average)
- 35.5% or more   (greater than the county average)
- Data not reported or available
- City boundaries

Source: San Diego Association of Governments, SANDAG (transit stops) and U.S. Census blocks, 2010   Analysis by CDPH and UCSF
* 15 minute or less headways during peak commute hours

Map 2. Percent of Residents within a Half-Mile of a Major Transit Stop*, Census Tracts within San Diego City, 2012

0 - 17.8%	(less than ½ the county ave. of 35.5%)
17.8 - 23.7%	(½ to ⅔ the county average)
23.7 - 35.5%	(⅔ to the county average)
35.5% or more	(greater than the county average)
	Not statistically reliable (RSE>30%)
	San Diego City boundaries

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0   5   10 Miles

Source: San Diego Association of Governments, SANDAG (transit stops) and U.S. Census blocks, 2010
* 15 minute or less headways during peak commute hours
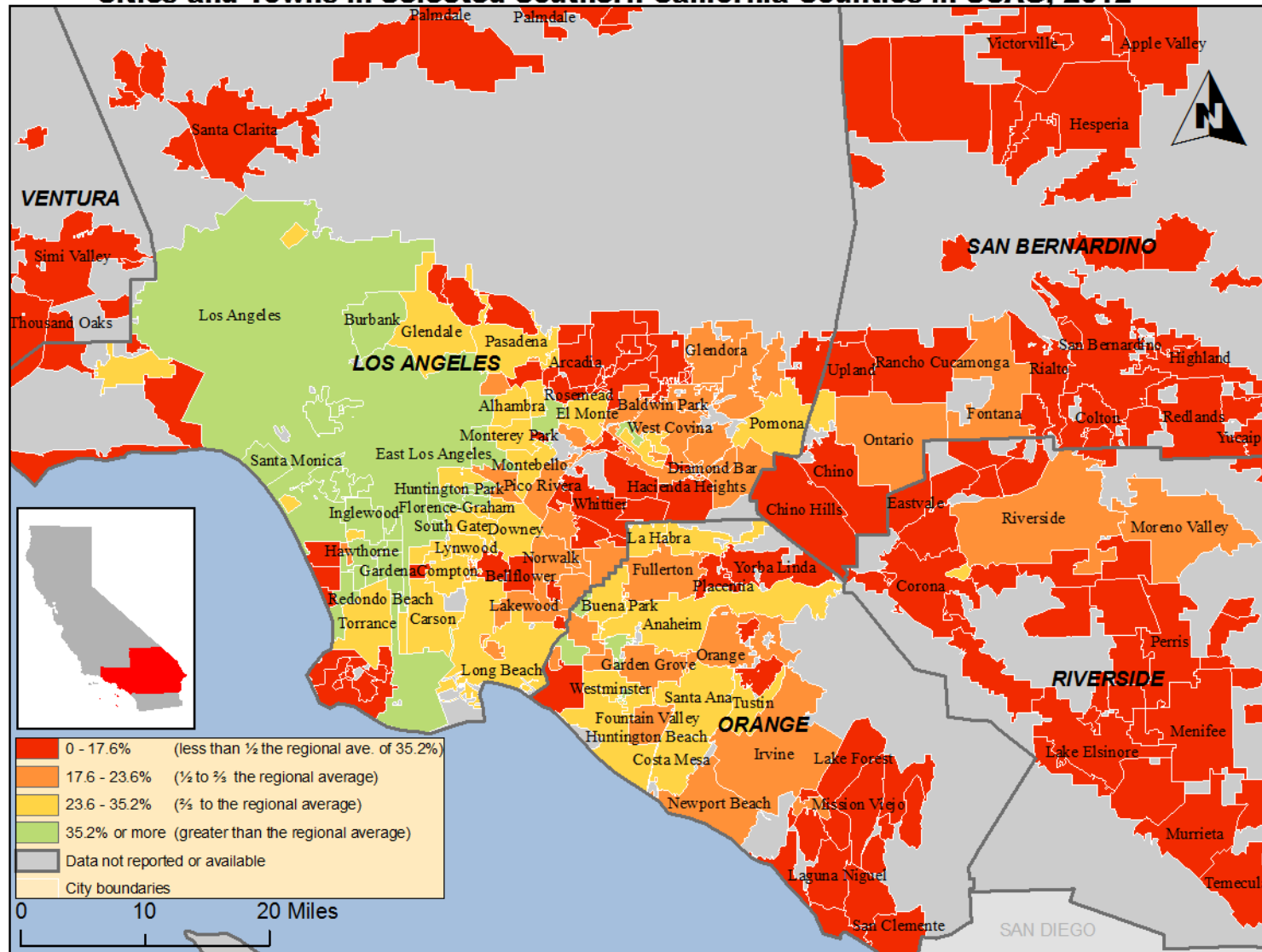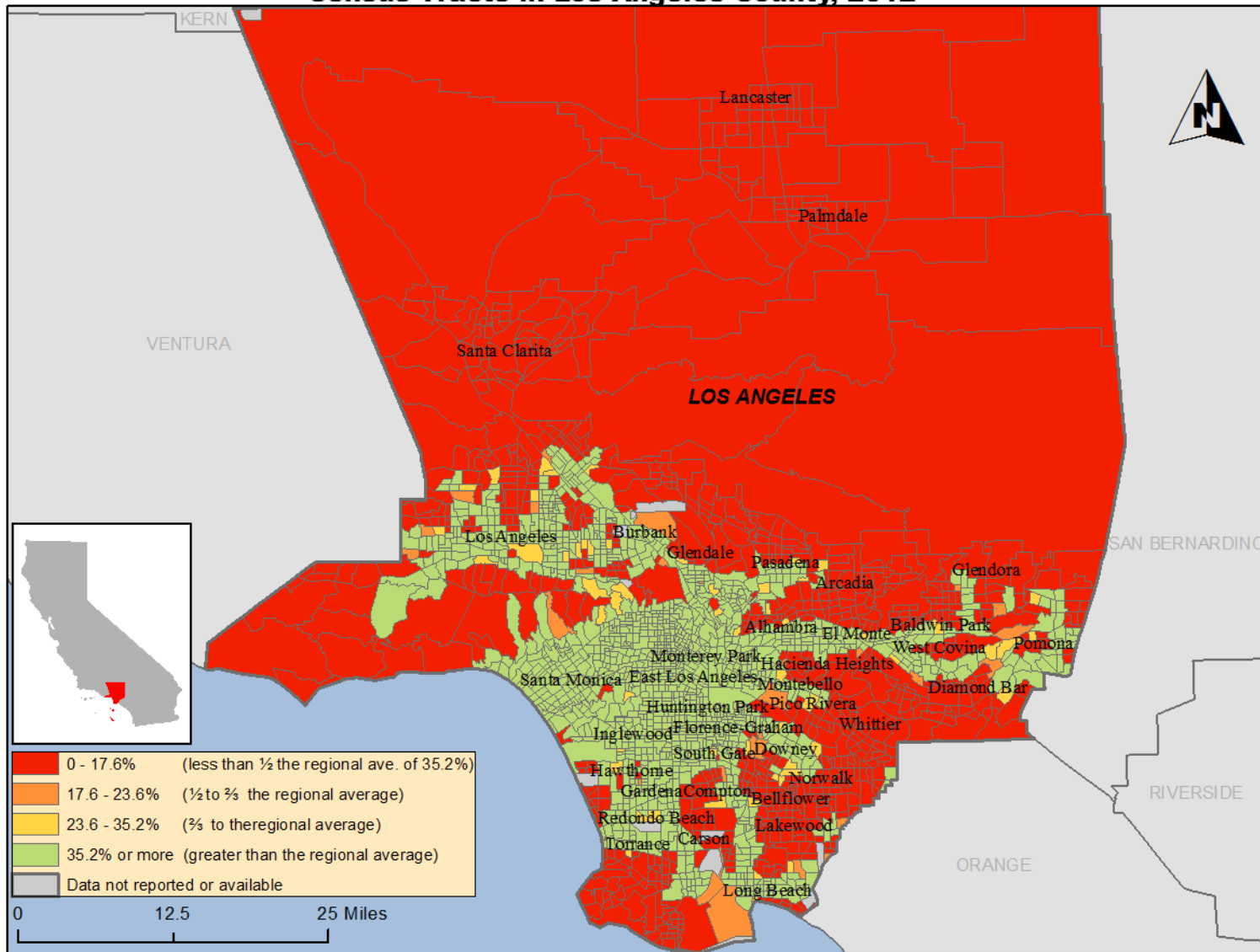
Analysis by CDPH and UCSF

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Map 3. Percent of Residents within a Half-Mile of a Major Transit Stop*, Cities and Towns in Selected Southern California Counties in SCAG, 2012

Legend:
- 0 - 17.6% (less than ½ the regional ave. of 35.2%)
- 17.6 - 23.6% (½ to ⅔ the regional average)
- 23.6 - 35.2% (⅔ to the regional average)
- 35.2% or more (greater than the regional average)
- Data not reported or available
- City boundaries

0   10   20 Miles

Source: Southern California Association of Governments, SCAG (transit stops) and U.S. Census blocks, 2010
* 15 minute or less headways during peak commute hours
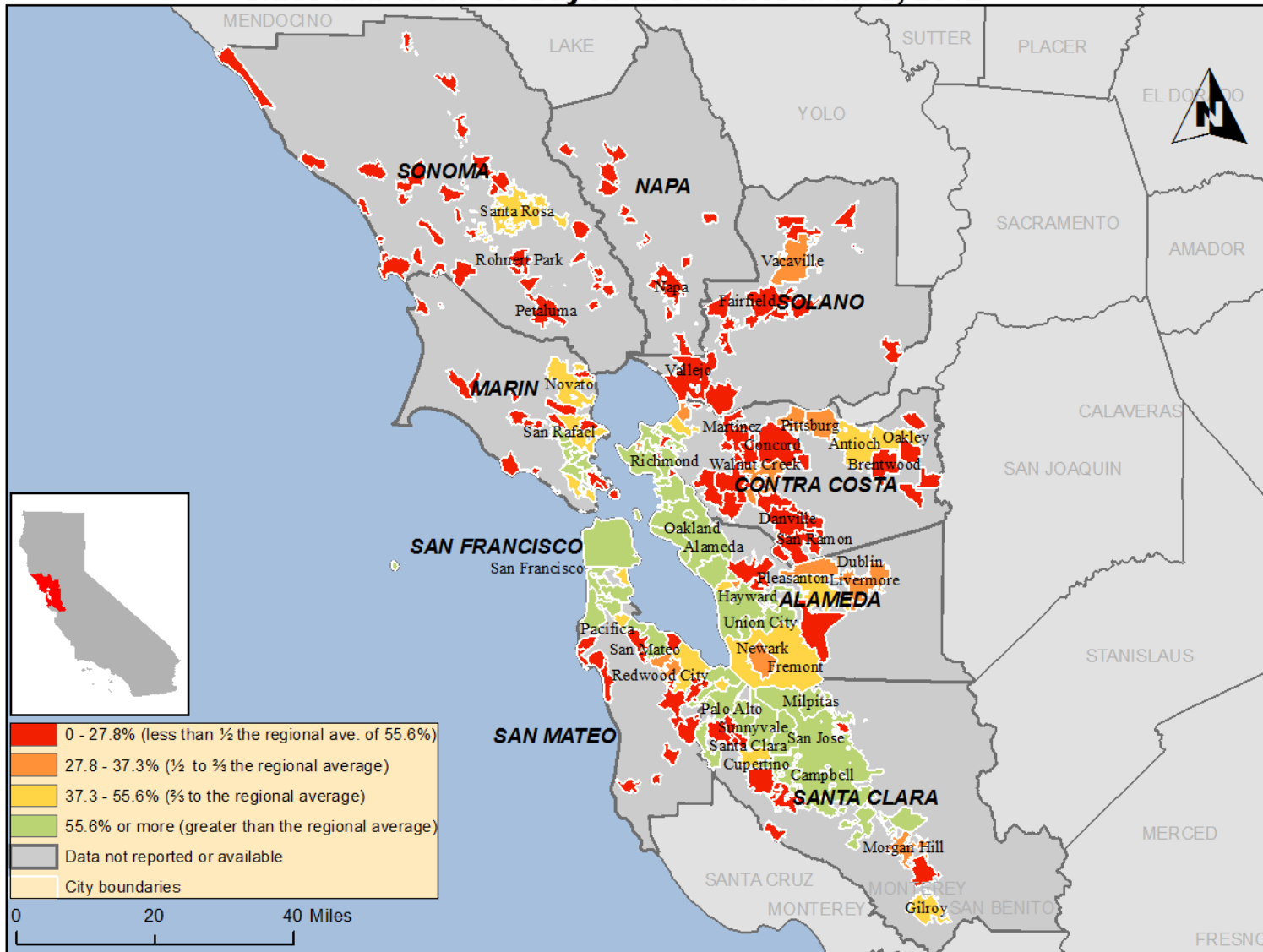
Analysis by CDPH and UCSF

Map 4. Percent of Residents within a Half-Mile of a Major Transit Stop*, Census Tracts in Los Angeles County, 2012

0 - 17.6%	(less than ½ the regional ave. of 35.2%)
17.6 - 23.6%	(½ to ⅔ the regional average)
23.6 - 35.2%	(⅔ to theregional average)
35.2% or more	(greater than the regional average)
Data not reported or available	

0   12.5   25 Miles

Source: Southern California Association of Governments, SCAG (transit stops) and U.S. Census blocks, 2010
* 15 minute or less headways during peak commute hours
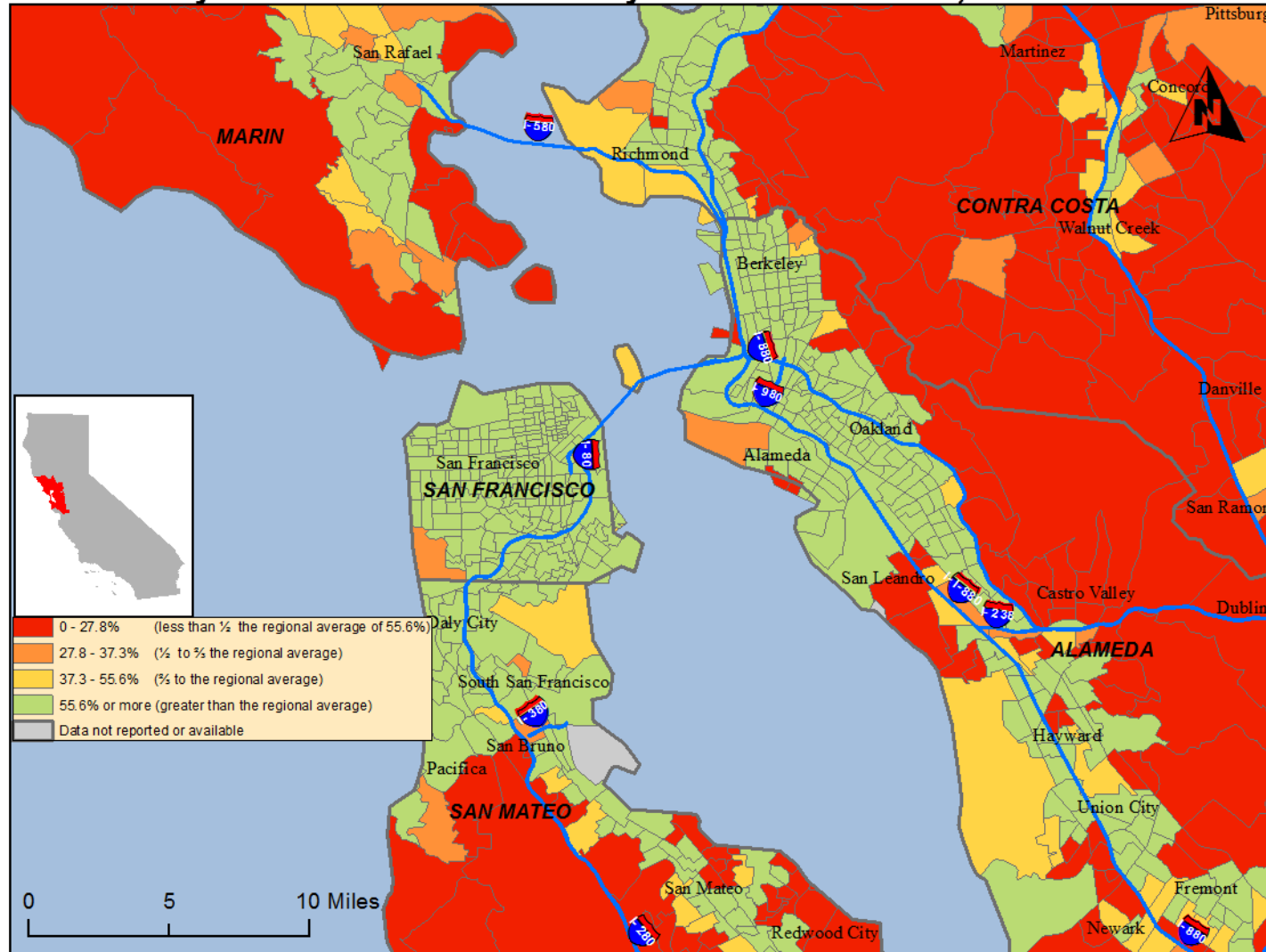
Analysis by CDPH and UCSF

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Map 5. Percent of Residents within a Half-Mile of a Major Transit Stop*, Cities and Towns of Bay Area Counties in MTC, 2012

Legend:
- 0 - 27.8% (less than ½ the regional ave. of 55.6%)
- 27.8 - 37.3% (½ to ⅔ the regional average)
- 37.3 - 55.6% (⅔ to the regional average)
- 55.6% or more (greater than the regional average)
- Data not reported or available
- City boundaries

0   20   40 Miles

Source: Metropolitan Transportation Commission, MTC (transit stops) and U.S. Census blocks, 2010
* 15 minute or less headways during peak commute hours
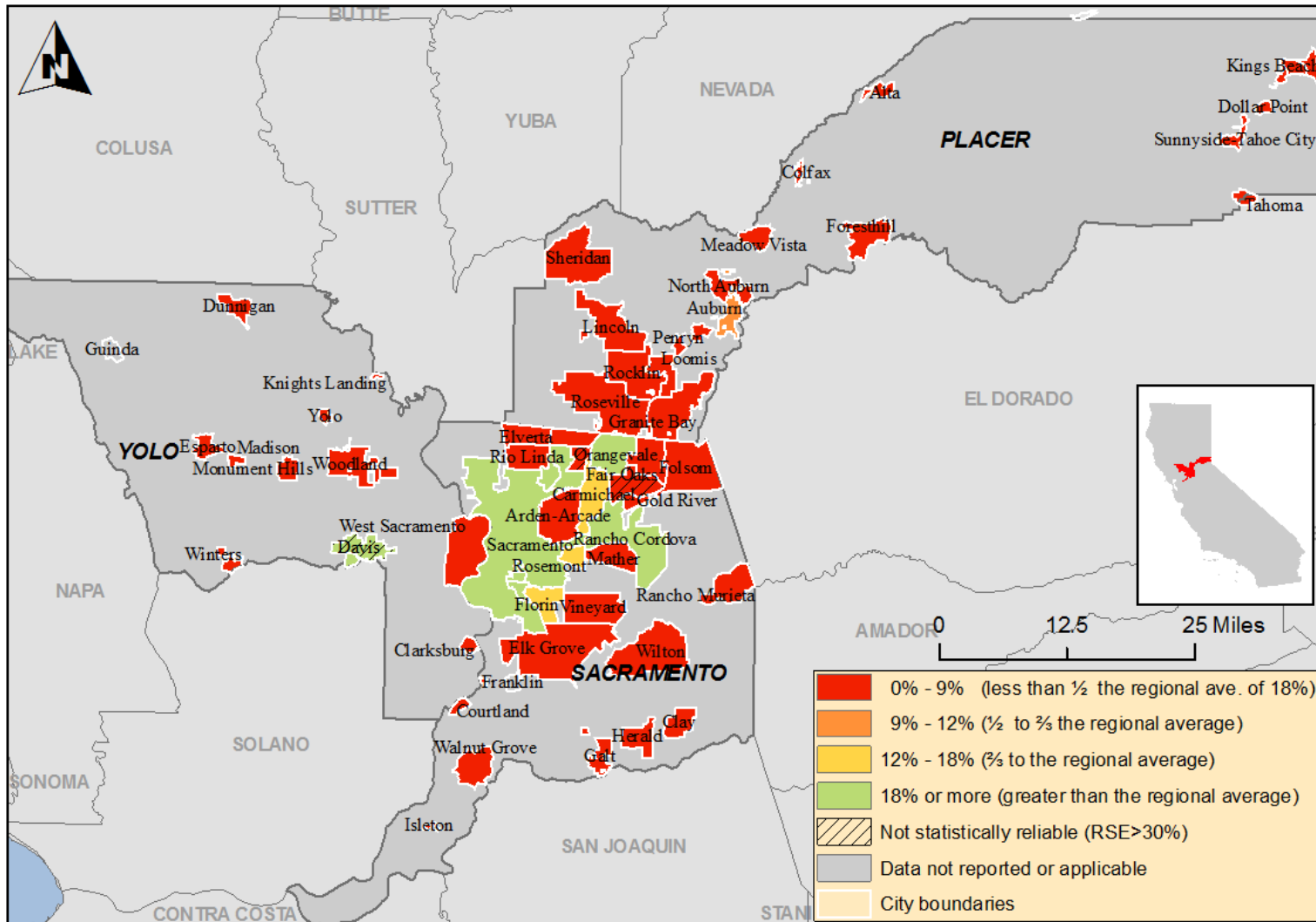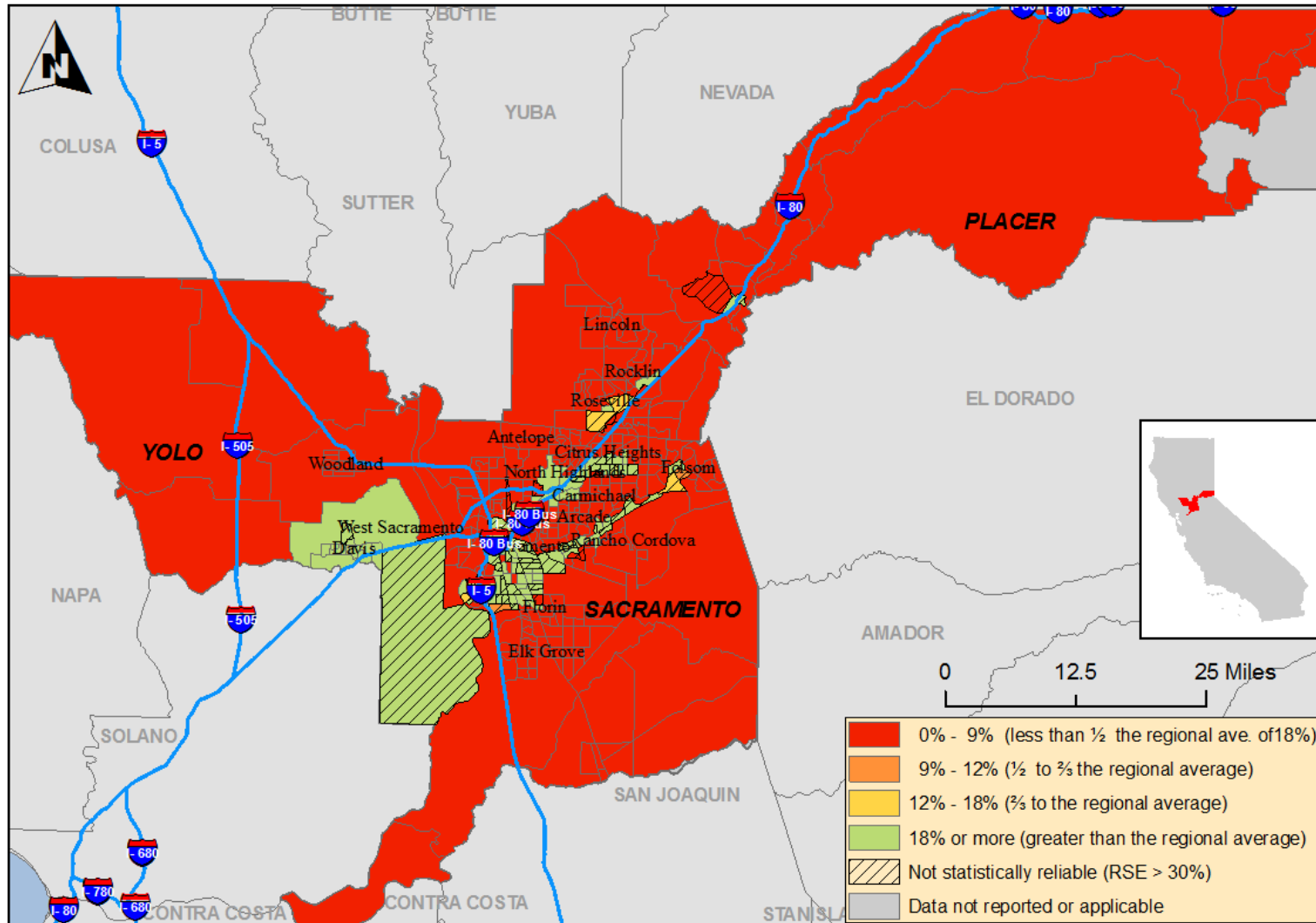
Analysis by CDPH and UCSF

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Map 6. Percent of Residents within a Half-Mile of a Major Transit Stop*, by Census Tract of Selected Bay Area Counties in MTC, 2012

Legend:
- 0 - 27.8% (less than ½ the regional average of 55.6%)
- 27.8 - 37.3% (½ to ⅔ the regional average)
- 37.3 - 55.6% (⅔ to the regional average)
- 55.6% or more (greater than the regional average)
- Data not reported or available

Source: Metropolitan Transportation Commission, MTC (transit stops) and U.S. Census blocks, 2010
* 15 minute or less headways during peak commute hours

Analysis by CDPH and UCSF

Map 7. Percent of Residents within a Half-Mile of a Major Transit Stop*, Cities and Towns of Sacramento Area Counties in SACOG, 2008

Legend:
- 0% - 9% (less than ½ the regional ave. of 18%)
- 9% - 12% (½ to ⅔ the regional average)
- 12% - 18% (⅔ to the regional average)
- 18% or more (greater than the regional average)
- Not statistically reliable (RSE>30%)
- Data not reported or applicable
- City boundaries

Source: Sacramento Area Council of Governments, SACOG (transit stops) and U.S. Census blocks, 2010
*15 minute or less headways during peak commute hours

Analysis by CDPH and UCSF

Map 8. Percent of Residents within a Half-Mile of a Major Transit Stop*, by Census Tracts of Sacramento Area Counties in SACOG, 2008

Legend:
- 0% - 9% (less than ½ the regional ave. of 18%)
- 9% - 12% (½ to ⅔ the regional average)
- 12% - 18% (⅔ to the regional average)
- 18% or more (greater than the regional average)
- Not statistically reliable (RSE > 30%)
- Data not reported or applicable

Source: Sacramento Area Council of Governments, SACOG (transit stops) and U.S. Census blocks, 2010
*15 minute or less headways during peak commute hours

Analysis by CDPH and UCSF

Figure 1. Percent of County Residents with Access to High Quality[a] Public Transit, Southern California (SCAG) and San Diego, 2012
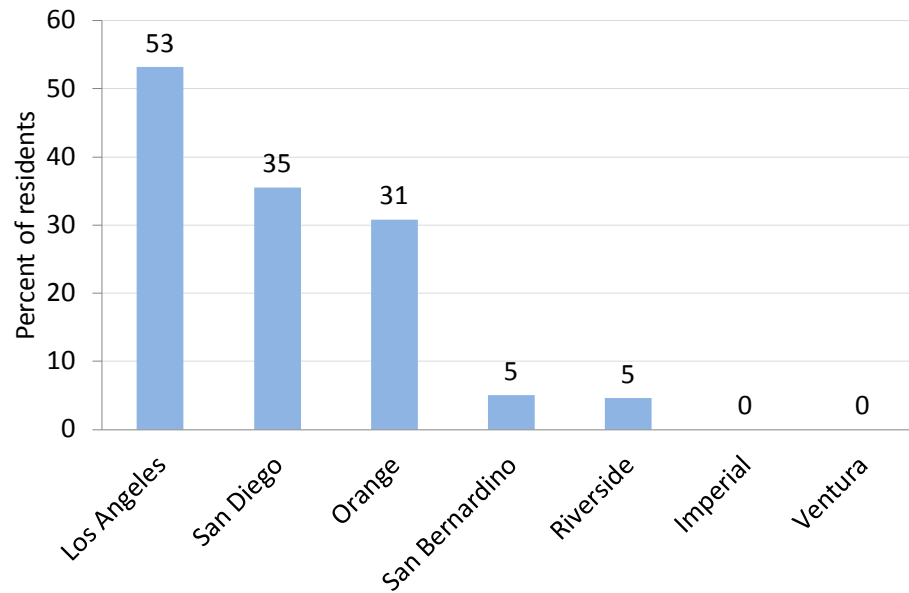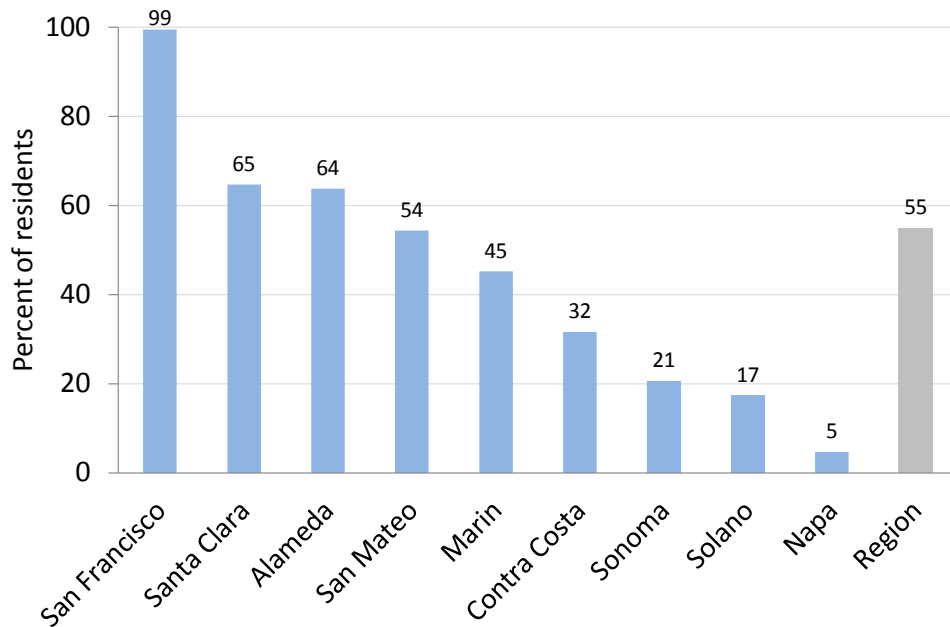

Data Source: U.S. Census Bureau, 2010 Census, transit data from Southern California Association of Governments (SCAG) and San Diego Association of Governments (SANDAG)
[a] Population residing within ½ mile of a public transit stop with less than a 15 minute wait at peak hours

Figure 2. Percent of Residents with Access to High Quality[a] Public Transit, Southern California Region (SCAG) by Race/Ethnicity, 2012
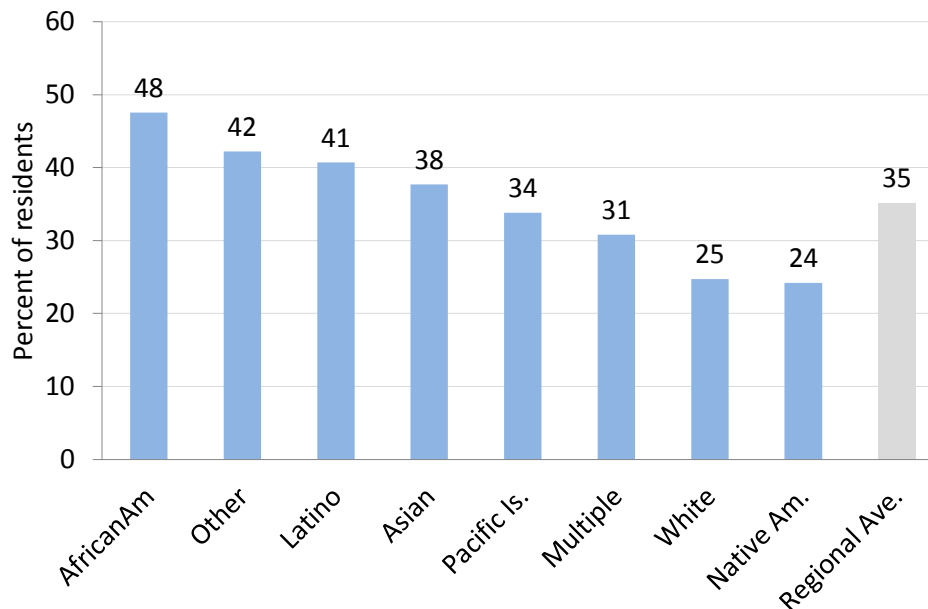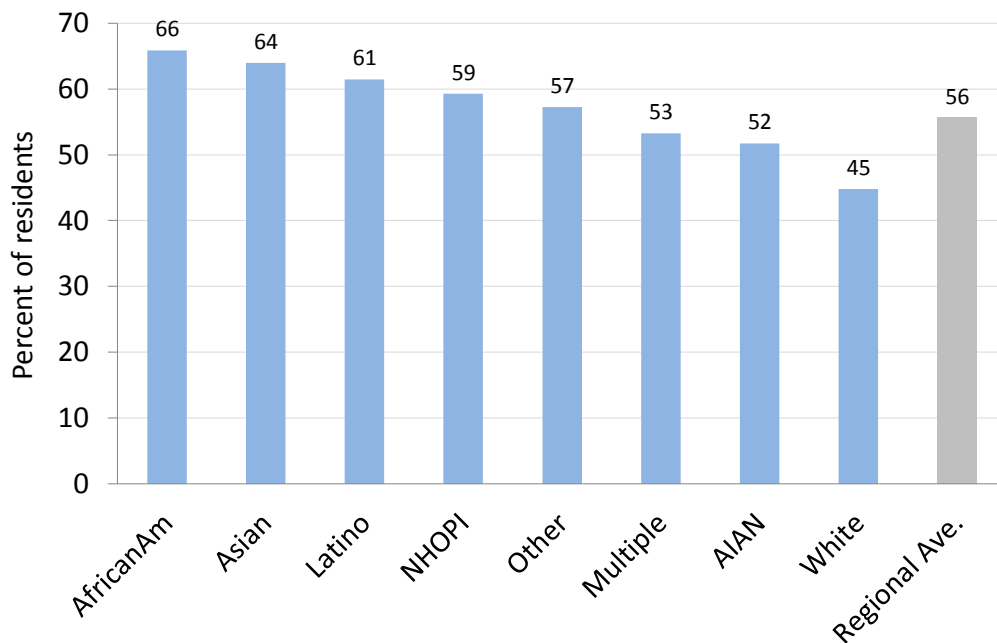

Data Source: U.S. Census Bureau, 2010 Census, transit data from Southern California Association of Governments (SCAG). [a] Population residing within ½ mile of a public transit stop with less than a 15 minute wait at peak hours.

Figure 3. Percent of County Residents with Access to High Quality[a] Public Transit, San Francisco Bay Area (MTC), 2012
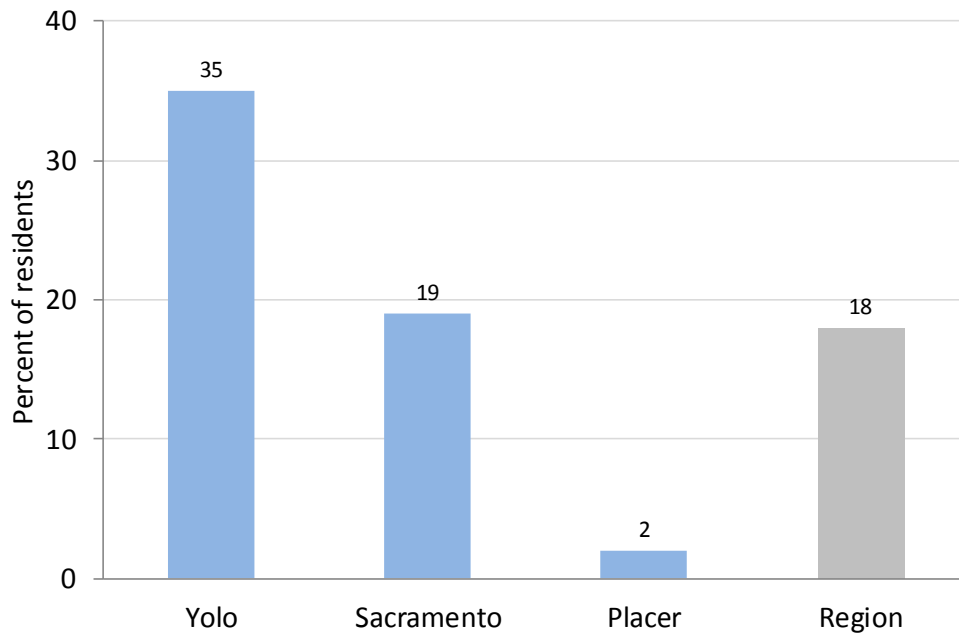

Data Source: U.S. Census Bureau, 2010 Census, transit data from the Metropolitan Transportation Commission. [a] Population residing within ½ mile of a public transit stop with less than a 15 minute wait at peak hours.

Figure 4. Percent of Residents with Access to High Quality[a] Public Transit, San Francisco Bay Area Region (MTC) by Race/Ethnicity, 2012
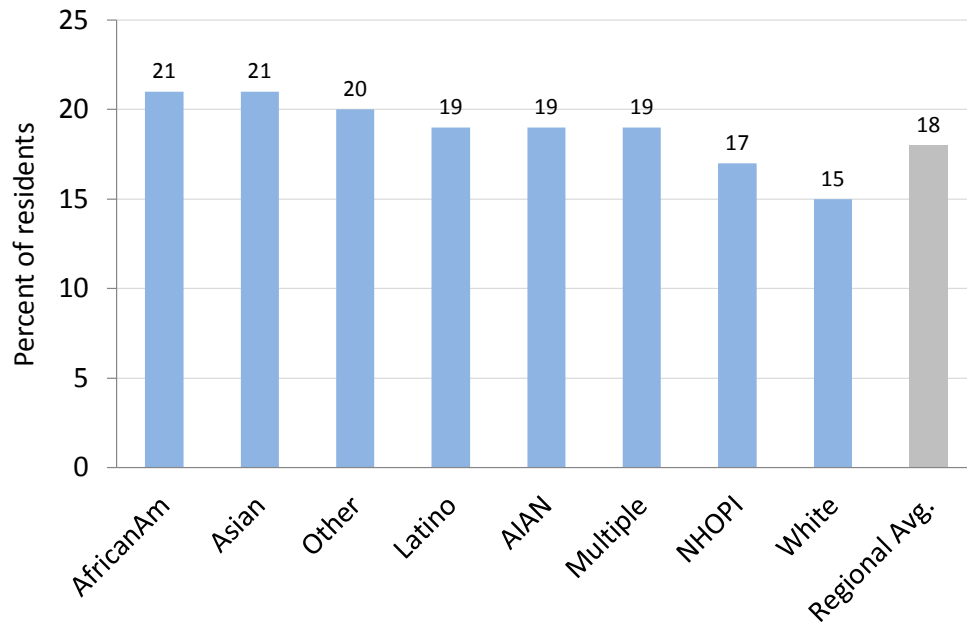

Data Source: U.S. Census Bureau, 2010 Census, transit data from Metropolitan Transportation Commission. [a]Population residing within ½ mile of a public transit stop with less than a 15 minute wait at peak hours

Figure 5. Percent of County Residents with Access to High Quality[a] Public Transit, Sacramento Area (SACOG), 2008

Data Source: U.S. Census Bureau, 2010 Census, transit data from the Sacramento Council of Governments.
[a] Population residing within ½ mile of a public transit stop with less than a 15 minute wait at peak hours.

Figure 6. Percent of Residents with Access to High Quality[a] Public Transit, Sacramento Area Region (SACOG) by Race/Ethnicity, 2008

Data Source: U.S. Census Bureau, 2010 Census, transit data from Sacramento Council of Governments.
[a]Population residing within ½ mile of a public transit stop with less than a 15 minute wait at peak hours

Table 1. Number and Percent of Population Residing within ½ Mile of a Transit Stop with Headways of 15 Minutes or Less during Peak Hours, San Diego County Cities, 2012

City	Residents: With Transit Access	Total	Per-cent	City	Residents: With Transit Access	Total	Per-cent
Alpine	0	14,236	0.0	Jamul	0	6,163	0.0
Bonita	647	12,538	5.2	Julian	0	1,502	0.0
Bonsall	0	3,982	0.0	La Mesa	28,803	57,065	50.5
Borrego Springs	0	3,429	0.0	La Presa	1,832	34,169	5.4
Bostonia	0	15,379	0.0	Lake San Marcos	0	4,437	0.0
Boulevard	0	315	0.0	Lakeside	0	20,648	0.0
Camp Pendleton N.	0	5,200	0.0	Lemon Grove	7,808	25,320	30.8
Camp Pendleton S.	0	10,616	0.0	Mount Laguna	0	57	0.0
Campo	0	2,684	0.0	National City	50,190	58,582	85.7
Carlsbad	0	105,328	0.0	Oceanside	51,875	167,086	31.0
Casa de Oro-Mt Helix	0	18,762	0.0	Pine Valley	0	1,510	0.0
Chula Vista	154,168	243,916	63.2	Potrero	0	656	0.0
Coronado	15,396	24,697	62.3	Poway	0	47,811	0.0
Crest	0	2,593	0.0	Rainbow	0	1,832	0.0
Del Mar	0	4,161	0.0	Ramona	0	20,292	0.0
Descanso	0	1,423	0.0	Rancho San Diego	0	21,208	0.0
El Cajon	8,113	99,478	8.2	Rancho Santa Fe	0	3,117	0.0
Encinitas	0	59,518	0.0	S.D. Country Estates	0	10,109	0.0
Escondido	20,745	143,911	14.4	San Diego	703,296	1,301,617	54.0
Eucalyptus Hills	0	5,313	0.0	San Marcos	0	83,781	0.0
Fairbanks Ranch	0	3,148	0.0	Santee	2,211	53,413	4.1
Fallbrook	0	30,534	0.0	Solana Beach	0	12,867	0.0
Granite Hills	0	3,035	0.0	Spring Valley	0	28,205	0.0
Harbison Canyon	0	3,841	0.0	Valley Center	0	9,277	0.0
Hidden Meadows	0	3,485	0.0	Vista	23,976	93,834	25.6
Imperial Beach	25,717	26,324	97.7	Winter Gardens	0	20,631	0.0
Jacumba	0	561	0.0				

Source: San Diego Association of Governments (transit stops), U.S. Census block groups 2010