



Communities of Excellence in Nutrition, Physical Activity, and Obesity Prevention (CX³):

Using GIS Mapping in Low-Income Neighborhood Food Environments

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Presented by:

Alyssa Ghirardelli, MPH, RD

Additional contributors: Valerie Quinn, MEd., Sharon Sugerman, MS, RD, Matthew Stone, MPH

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Presenter Disclosures

Alyssa Ghirardelli, MPH, RD

- (1) The following personal financial relationships with commercial interests relevant to this presentation existed during the past 12 months:

No relationships to disclose



CX³: Communities of Excellence

in Nutrition, Physical Activity and Obesity Prevention

- **Documents the physical environment and empowers local action to change conditions to support individual behaviors**
- **A planning model that involves assessing communities in relation to a variety of obesity prevention benchmarks known as community indicators and assets**
- **Activate consumers and partners to improve food availability in low-income neighborhoods**
- **3 = nutrition, physical activity and obesity prevention**

CX³ : Use of On-line Network GIS Map Viewer

<http://www.cnngis.org>

http://www.cnngis.org - Network for a Healthy California Map Viewer - Microsoft Internet Explorer

California Department of Public Health

Overview Map Print This Map Data Info Need Help? Contact Us Admin Tools About This Site

Zoom In Zoom Out Last View Full View Pan Get Info Select Clear Clear Theme Query Measure Save Map Load Map

Current Map Tool: Measure Distance

Scale 1:260,000

Map Layers Locate Advanced Census Buffer Measure

Distance measurement form

Total Distance:

Run Clear

Refresh the Map

Jump to a new location

Counties: -----Counties-----
Reg. Networks: -----Regional Networks-----
Census Tract: -----Census Tracts-----
Cities: Sacramento
Zip Code: Find Zip

Summarize Data

Summarize data from map layers in the current view. Select a layer from the list below and press GO.

Am. Cancer Society Offices
☒ Current View ☐ Current Selection

Go

CX³ Data (Cont.)

Field Surveys



CX³ Sites

23 Network funded Local Health Departments

All types: Urban dense, suburban, rural, remote

More w/ other funding, including CA Regional Obesity Prevention Projects



Local Health Departments

- ☆ = Pilot Sites (2006)
- ★ = Group 2 (2007)
- ★ = Group 3 (2008)
- ★ = Group 4 (2009)



CX³ Neighborhood Selection

- 3-7 low-income neighborhoods
- Each neighborhood comprised of
 - 1-5 census tracts
- > 50% of population in census tract at or below 185% Federal Poverty Level (FPL)
- Other selection factors
 - Established partnerships
 - Race/Ethnic make-up
 - Rural and Urban (for some sites)
 - Obesity rates (used by one site)



CX³ Supermarket Access

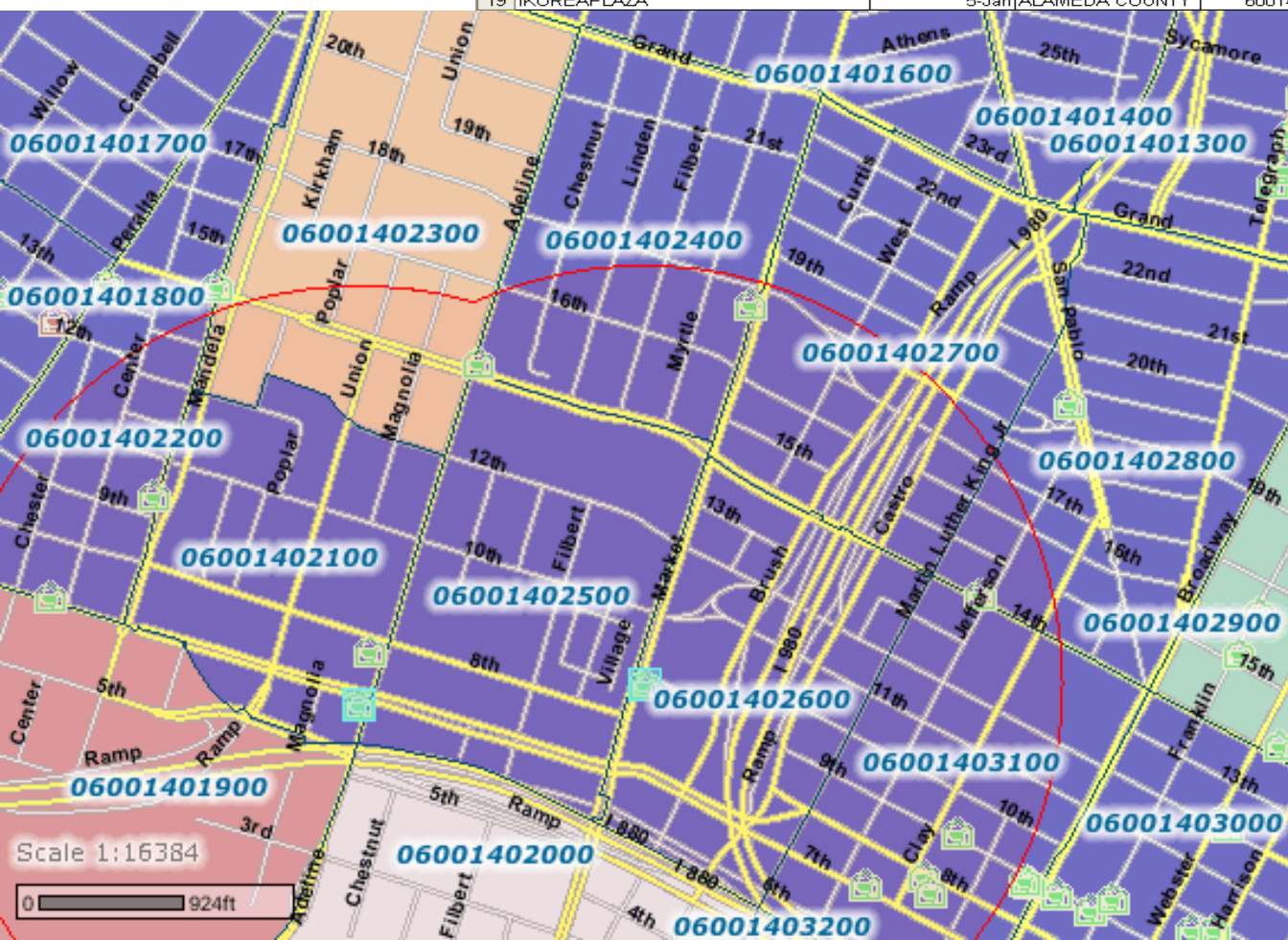


- Total number of residents served by supermarkets or large grocery stores (> **20 employees** and accounting for any overlap of markets)
- Estimated percent of neighborhood residents served and not served within ½ **mile buffer** of supermarkets or large grocery stores
- If no supermarket or large grocery store, approximate distance required to travel to supermarkets for most residents (2/3 or more)



Access to Supermarkets and large grocery

| | A | B | C | D | E | F | G |
|----|----------------------------|---------------------|----------------|------------------------|-----------------|----------------|-----------------|
| 1 | Company Name | No. Employees Range | County | 2000 U.S. Census Tract | Retail Category | Retail Type | Address |
| 2 | SAIGON MARKET | 5-Jan | ALAMEDA COUNTY | 6001401300 | GENERAL GROCERY | Grocery, Other | 2331 TELEGRAPH |
| 3 | YAGRABET MARKET | 5-Jan | ALAMEDA COUNTY | 6001401300 | GENERAL GROCERY | Grocery, Other | 2412 TELEGRAPH |
| 4 | PUSAN PLAZA MARKET | 21-50 | ALAMEDA COUNTY | 6001401300 | GENERAL GROCERY | Grocery, Other | 2370 TELEGRAPH |
| 5 | HAPPY MARKET | 5-Jan | ALAMEDA COUNTY | 6001401300 | GENERAL GROCERY | Grocery, Other | 2510 TELEGRAPH |
| 6 | FAMILY MARKET | 5-Jan | ALAMEDA COUNTY | 6001401800 | GENERAL GROCERY | Large Chain | 1600 12TH ST |
| 7 | WILLOW MARKET | 5-Jan | ALAMEDA COUNTY | 6001401800 | GENERAL GROCERY | Grocery, Other | 1650 12TH ST AP |
| 8 | GREEN VALLEY FOODS | 5-Jan | ALAMEDA COUNTY | 6001402100 | GENERAL GROCERY | Grocery, Other | 749 ADELINE ST |
| 9 | EBJ WHOLESALE | 21-50 | ALAMEDA COUNTY | 6001402100 | GENERAL GROCERY | Grocery, Other | 1155 7TH ST |
| 10 | CYPRESS GROCERY AND LIQUOR | 5-Jan | ALAMEDA COUNTY | 6001402200 | GENERAL GROCERY | Grocery, Other | 933 MANDELA PI |
| 11 | SEVEN STREET FOOD & LIQUOR | 5-Jan | ALAMEDA COUNTY | 6001402200 | GENERAL GROCERY | Grocery, Other | 1460 7TH ST STE |
| 12 | STATE DISCOUNT STORE | 5-Jan | ALAMEDA COUNTY | 6001402200 | GENERAL GROCERY | Grocery, Other | 1334 PERALTA S |
| 13 | SONTEPHEAP MARKET | 5-Jan | ALAMEDA COUNTY | 6001402200 | GENERAL GROCERY | Grocery, Other | 1400 14TH ST ST |
| 14 | MILLENNIUM MARKET | 5-Jan | ALAMEDA COUNTY | 6001402400 | GENERAL GROCERY | Grocery, Other | 1741 MARKET ST |
| 15 | SUNBEAM MARKET | 5-Jan | ALAMEDA COUNTY | 6001402400 | GENERAL GROCERY | Grocery, Other | 1400 ADELINE ST |
| 16 | GATEWAY FOODS | 21-50 | ALAMEDA COUNTY | 6001402600 | GENERAL GROCERY | Grocery, Other | 900 MARKET ST |
| 17 | S & A LIQUORS | 5-Jan | ALAMEDA COUNTY | 6001402800 | GENERAL GROCERY | Grocery, Other | 600 14TH ST |
| 18 | ALEXANDRA MARKET & SPIRIT | 5-Jan | ALAMEDA COUNTY | 6001402800 | GENERAL GROCERY | Grocery, Other | 1913 SAN PABLO |
| 19 | IKOREAPLAZA | 5-Jan | ALAMEDA COUNTY | 6001402900 | GENERAL GROCERY | Grocery, Other | 1634 FRANKLIN S |



| 2000 U.S. Census Tract | Retail Category | Retail Type | Address |
|------------------------|-----------------|----------------|-----------------|
| 6001401300 | GENERAL GROCERY | Grocery, Other | 2331 TELEGRAPH |
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| 6001401300 | GENERAL GROCERY | Grocery, Other | 2370 TELEGRAPH |
| 6001401300 | GENERAL GROCERY | Grocery, Other | 2510 TELEGRAPH |
| 6001401800 | GENERAL GROCERY | Large Chain | 1600 12TH ST |
| 6001401800 | GENERAL GROCERY | Grocery, Other | 1650 12TH ST AP |
| 6001402100 | GENERAL GROCERY | Grocery, Other | 749 ADELINE ST |
| 6001402100 | GENERAL GROCERY | Grocery, Other | 1155 7TH ST |
| 6001402200 | GENERAL GROCERY | Grocery, Other | 933 MANDELA PI |
| 6001402200 | GENERAL GROCERY | Grocery, Other | 1460 7TH ST STE |
| 6001402200 | GENERAL GROCERY | Grocery, Other | 1334 PERALTA S |
| 6001402200 | GENERAL GROCERY | Grocery, Other | 1400 14TH ST ST |
| 6001402400 | GENERAL GROCERY | Grocery, Other | 1741 MARKET ST |
| 6001402400 | GENERAL GROCERY | Grocery, Other | 1400 ADELINE ST |
| 6001402600 | GENERAL GROCERY | Grocery, Other | 900 MARKET ST |
| 6001402800 | GENERAL GROCERY | Grocery, Other | 600 14TH ST |
| 6001402800 | GENERAL GROCERY | Grocery, Other | 1913 SAN PABLO |
| 6001402900 | GENERAL GROCERY | Grocery, Other | 1634 FRANKLIN S |
| 6001402900 | GENERAL GROCERY | Grocery, Other | 1500 FRANKLIN S |
| 6001402900 | GENERAL GROCERY | Grocery, Other | 332 14TH ST |
| 6001402900 | GENERAL GROCERY | Grocery, Other | 401 9TH ST |
| 6001402900 | GENERAL GROCERY | Grocery, Other | 429 9TH ST |
| 6001402900 | GENERAL GROCERY | Grocery, Other | 325 10TH ST |
| 6001402900 | GENERAL GROCERY | Grocery, Other | 344 12TH ST |
| 6001402900 | GENERAL GROCERY | Grocery, Other | 325 10TH ST |
| 6001402900 | GENERAL GROCERY | Grocery, Other | 928 FRANKLIN ST |
| 6001402900 | GENERAL GROCERY | Grocery, Other | 303 10TH ST |
| 6001402900 | GENERAL GROCERY | Grocery, Other | 928 FRANKLIN ST |

1/2 mile buffer

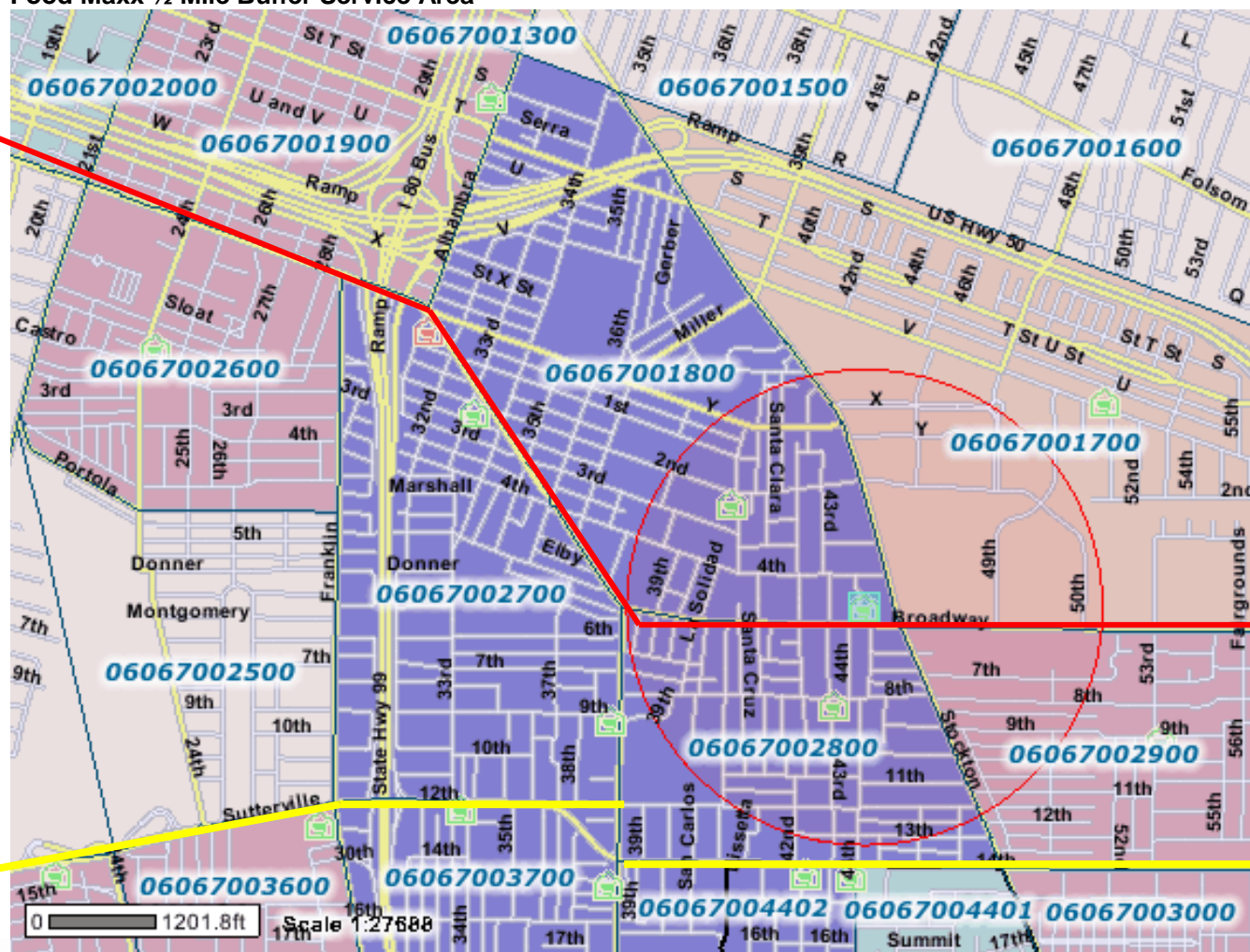
CX³ Supermarket Access Transit

- Proportion of supermarkets or large grocery stores (> 20 emp) with convenient public transit
 - Supermarket or large grocery store has a stop within 1 block
 - Frequency: No less than 30 minutes each way including evenings and weekends
 - Route access through residential areas
- If no market in the neighborhood, expand search with buffer
 - Urban or older/denser suburb—2 miles
 - Newer suburb—5 miles
 - Rural—15 miles

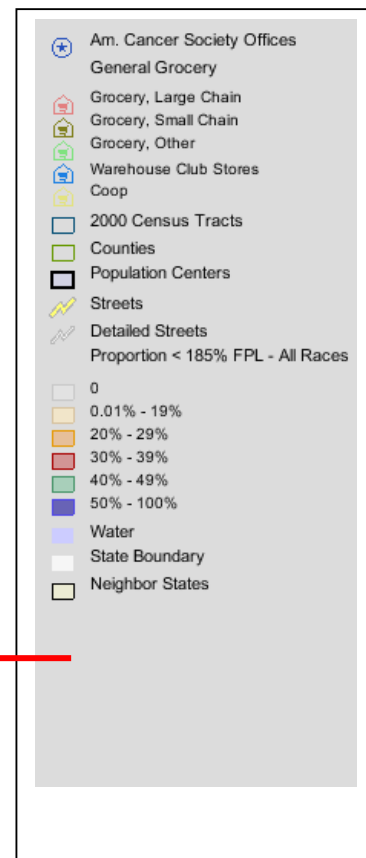


Map NF1 - 3
Oak Park, Sacramento, CA- Markets
Food Maxx ½ Mile Buffer Service Area

Rte. 51



Rte. 83



CX³ Markets Around Schools

- Number of small markets and convenience stores within ½ mile of schools
- Proportion of schools with small markets and convenience stores within ½ mile
- Highest number of small markets and convenience stores for a school within ½ mile (ie. worst case scenario)



| | A | B | C | D | E | F | G | |
|----|---------------------------------|------------------------|---------------------|----------------|-------------------------|---------|------------|--|
| 1 | Company Name | 2000 U.S. Census Tract | No. Employees Range | Retail Type | Address | City | Zip Code | |
| 2 | FAMILY MARKET | 6001401800 | 5-Jan | Large Chain | 1600 12TH ST | OAKLAND | 94607-1404 | |
| 3 | WILLOW MARKET | 6001401800 | 5-Jan | Grocery, Other | 1650 12TH ST APT 5 | OAKLAND | 94607-1443 | |
| 4 | GREEN VALLEY FOODS | 6001402100 | 5-Jan | Grocery, Other | 749 ADELINE ST | OAKLAND | 94607-2607 | |
| 5 | EBJ WHOLESALE | 6001402100 | 21-50 | Grocery, Other | 1155 7TH ST | OAKLAND | 94607-2660 | |
| 6 | CYPRESS GROCERY AND LIQUOR | 6001402200 | 5-Jan | Grocery, Other | 933 MANDELA PKWY | OAKLAND | 94607-2116 | |
| 7 | SEVEN STREET FOOD & LIQUOR | 6001402200 | 5-Jan | Grocery, Other | 1460 7TH ST STE A | OAKLAND | 94607-1983 | |
| 8 | STATE DISCOUNT STORE | 6001402200 | 5-Jan | Grocery, Other | 1334 PERALTA ST | OAKLAND | 94607-2016 | |
| 9 | SONTEPEAP MARKET | 6001402200 | 5-Jan | Grocery, Other | 1400 14TH ST STE C | OAKLAND | 94607-2008 | |
| 10 | MILLENNIUM MARKET | 6001402400 | 5-Jan | Grocery, Other | 1741 MARKET ST | OAKLAND | 94607-3329 | |
| 11 | SUNBEAM MARKET | 6001402400 | 5-Jan | Grocery, Other | 1400 ADELINE ST | OAKLAND | 94607-2810 | |
| 12 | GATEWAY FOODS | 6001402600 | 21-50 | Grocery, Other | 900 MARKET ST STE B1 | OAKLAND | 94607-3118 | |
| 13 | S & A LIQUORS | 6001402800 | 5-Jan | Grocery, Other | 600 14TH ST | OAKLAND | 94612-1219 | |
| 14 | ALEXANDRA MARKET & SPIRIT | 6001402800 | 5-Jan | Grocery, Other | 1913 SAN PABLO AVE | OAKLAND | 94612-1305 | |
| 15 | OAKLAND MARKET INC | 6001403000 | 20-Jun | Grocery, Other | 401 9TH ST | OAKLAND | 94607-4001 | |
| 16 | KHANH PHONG GROCERY STORE | 6001403000 | 5-Jan | Grocery, Other | 429 9TH ST | OAKLAND | 94607-4001 | |
| 17 | SUN LUNG FAT SUPERMARKETING INC | 6001403000 | 20-Jun | Grocery, Other | 325 10TH ST | OAKLAND | 94607-6511 | |
| | | | | Grocery, Other | 344 12TH ST | OAKLAND | 94607-4218 | |
| | | | | Grocery, Other | 375 9TH ST | OAKLAND | 94607-4242 | |
| | | | | Grocery, Other | 325 10TH ST | OAKLAND | 94607-6511 | |
| | | | | Grocery, Other | 928 FRANKLIN ST APT 330 | OAKLAND | 94607-4205 | |
| | | | | Grocery, Other | 303 10TH ST | OAKLAND | 94607-4213 | |
| | | | | Grocery, Other | 928 FRANKLIN ST APT 330 | OAKLAND | 94607-4205 | |
| | | | | Grocery, Other | 1210 WEBSTER ST | OAKLAND | 94612-3919 | |
| | | | | Grocery, Other | 542 9TH ST | OAKLAND | 94607-3938 | |
| | | | | Grocery, Other | 582 7TH ST | OAKLAND | 94607-3943 | |
| | | | | Grocery, Other | 547 8TH ST | OAKLAND | 94607-3933 | |
| | | | | Grocery, Other | 535 8TH ST | OAKLAND | 94607-3903 | |



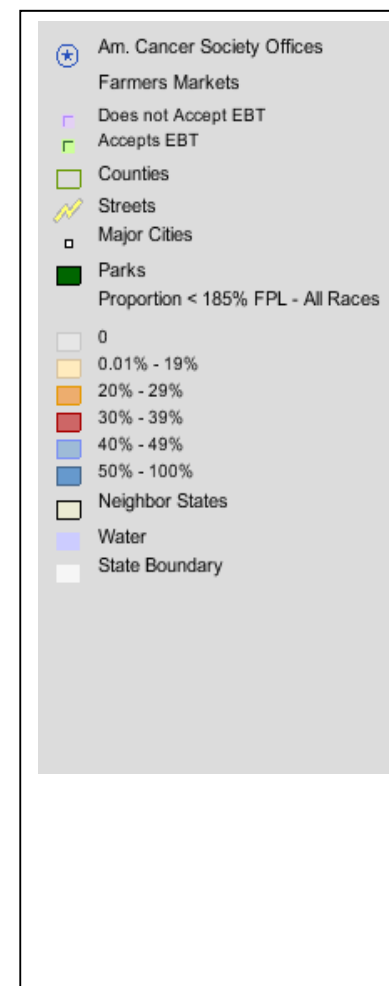
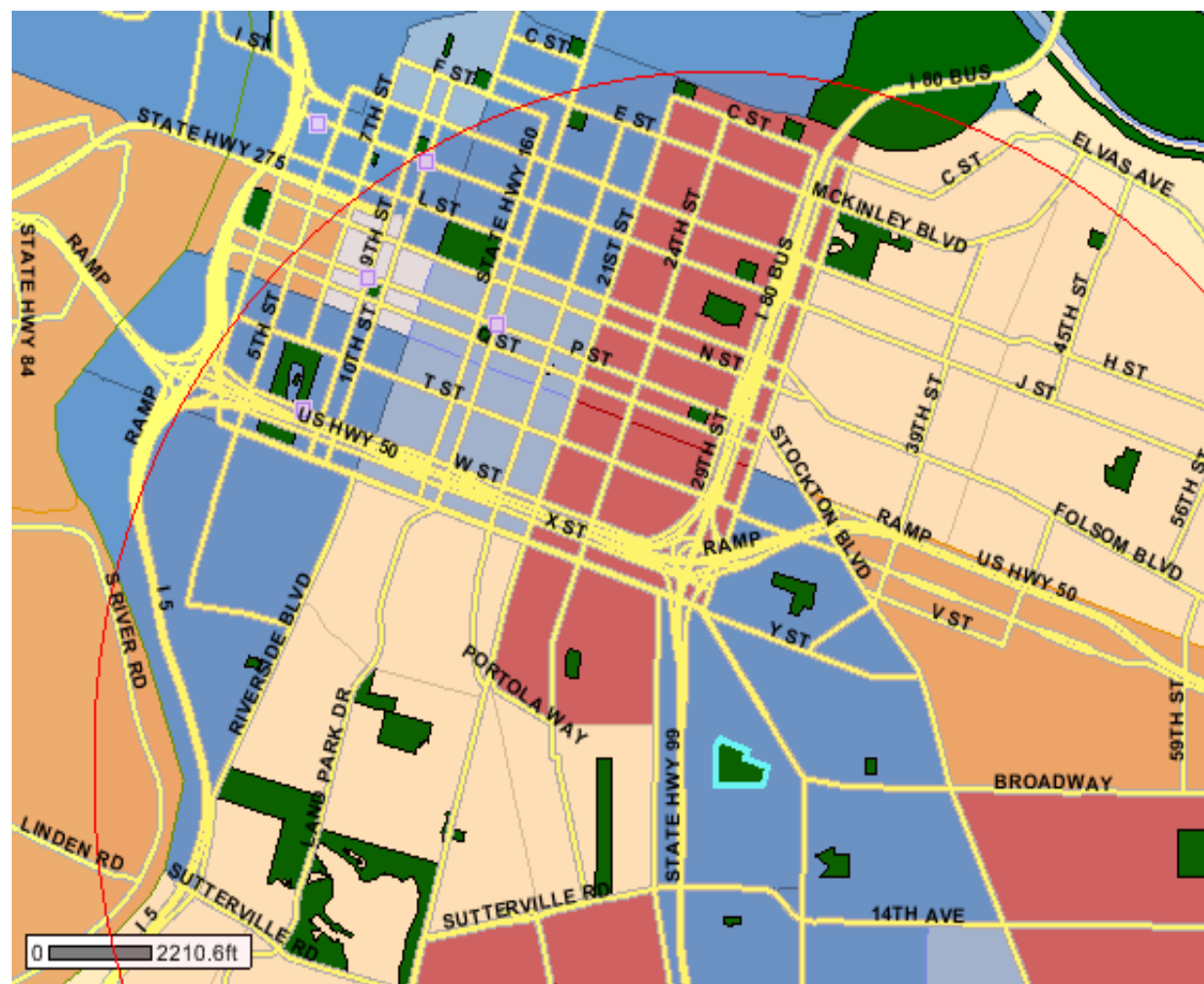
CX³ Farmers' Markets

- Number of farmers markets in the neighborhood and if accept EBT, WIC, Senior Vouchers
- If no farmers markets in neighborhood, number within 5 miles
 - If they accept EBT, WIC, Senior Vouchers
 - If have convenient public transit



Map NF7 - 1

Famer's Market Access- 2 ½ mile buffer



CX³ Fast Food Outlets

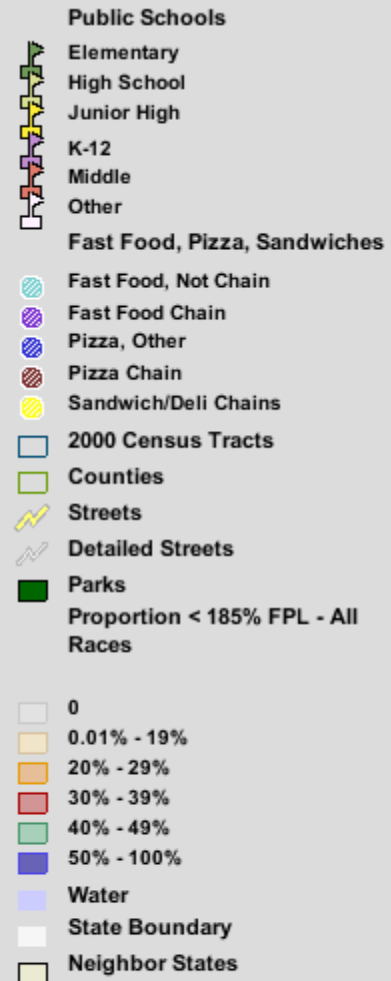


- Ratios of fast food to population
 - Fast Food Chain, Non-Chain, Pizza, Sandwich/Deli
- Number of outlets within 1000 ft and ½ mile to schools and parks in neighborhood
- Proportion of schools/parks with fast food outlets within 1000 ft and ½ mile
- Highest number of outlets for a school/park with fast food within 1000 ft and ½ mile (ie. worst case scenario)



Fast food around schools & parks

1/2 mile buffer



CX³ Aggregated Datasets

- **18 Local Health Departments**
- **73 Neighborhoods**
 - **Supermarket Access & Transit**
 - **Farmers Markets**
 - **Fast Food**
- **52 Neighborhoods**
 - **Small Markets and Convenience Stores around 133 Schools**
- **Most neighborhoods defined by 1-2 census tracts, maximum of 5**



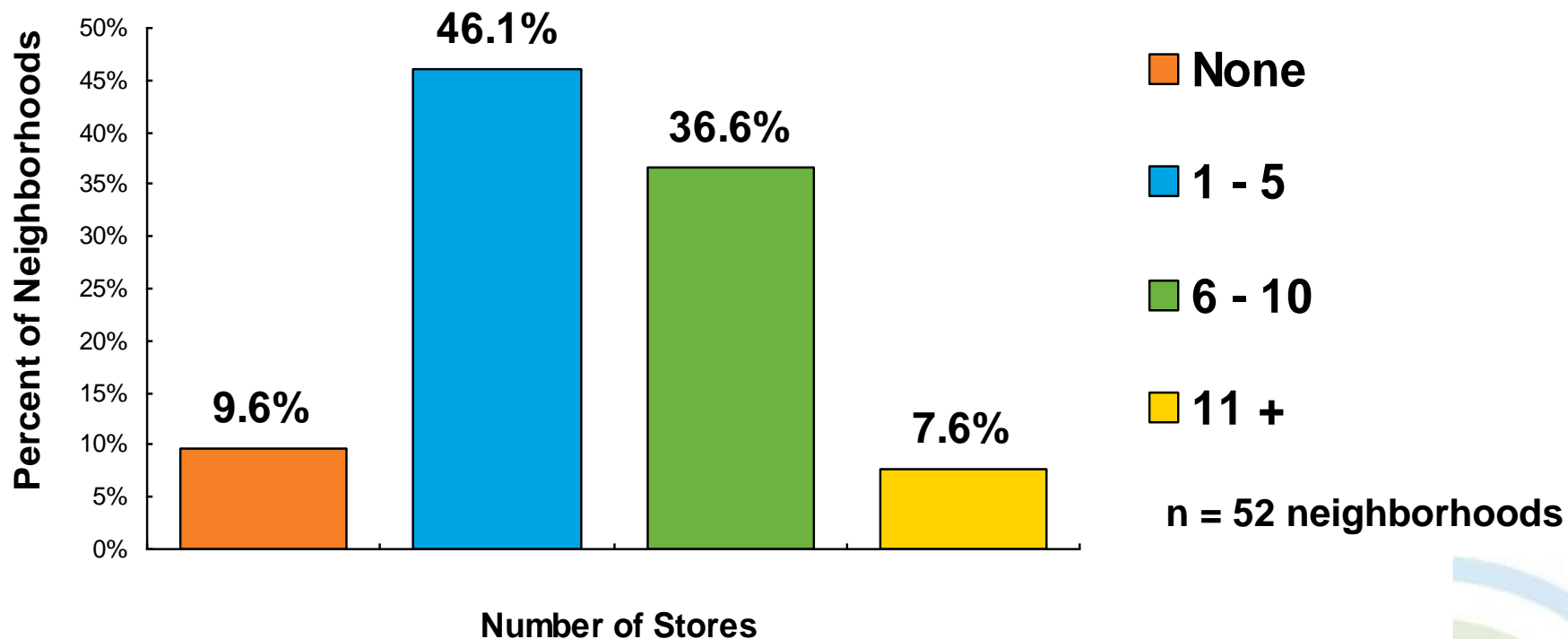
CX³ Findings- Supermarket Access

- 31% neighborhoods had no supermarket within census tract boundaries
- 42% reported most residents had access to supermarket within ½ mile
- 74% access within 1 mile
- Mean distance for most residents to get to supermarket .88 miles (removing 17 mile rural outlier)
- 63% lacked convenient public transit



CX3 Findings- Stores Around Schools

Convenience and Small Markets within 1/2 Mile of Schools



CX³ Findings- Farmers' Markets

- 76% no farmers' market (FM) in the neighborhood
- In the 18 neighborhoods with a FM,
 - 78% accept EBT (Electronic Benefits Transfer- aka. Food Stamps or Supplemental Nutrition Assistance Program), WIC or Senior Vouchers
- For those with no FM in neighborhood,
 - 36% had 1-2 w/in 5 miles
 - 50% had 3 or more w/in 5 miles
 - 66% had convenient public transit to market w/in 5 miles
- 13% had no farmers' market within 5 miles



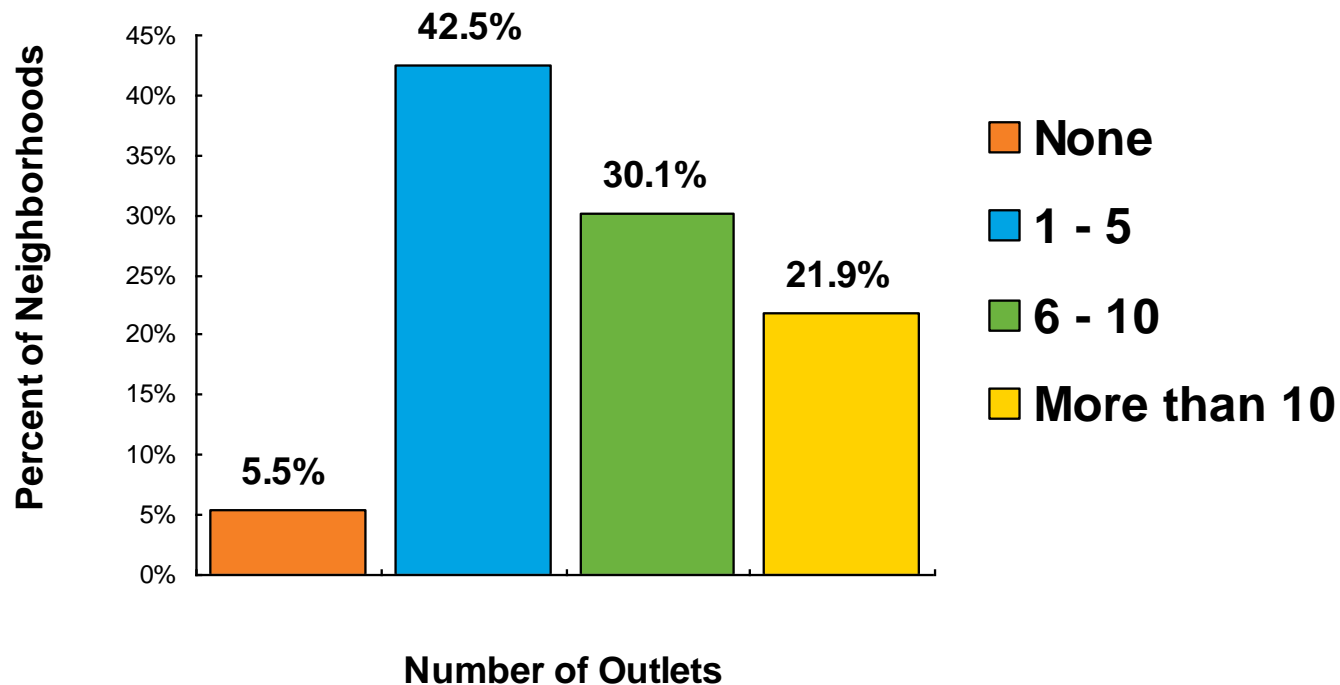
CX3 Findings- Fast Food

Neighborhood

- Only 4 had no fast food
- 12% 15 or more
- One neighborhood with 30 in 2 census tracts
- Mean ratio of outlets to population 1:1,608
 - Worst of 1:202



n = 73
neighborhoods



CX³ Findings- Fast Food Around Schools

- 1000 ft (approx. 2 blocks)
 - 49% neighborhoods had no fast food
 - 30% neighborhoods had 1-2 fast food
- 1/2 Mile
 - only 11% had none
 - 22% 10+
 - Mean of 6 fast food



CX³ Use of GIS Maps

- Maps rated as very useful by local health departments
- Locals describe power of maps combined with local level data and photos
- Provide visual description of relationships between food sources, community residents and other neighborhood infrastructure
- Give initial view to make decisions for dedicating resources, education and action in neighborhoods



Issues – Gaps & Opportunities

- Drawing boundaries to fit natural neighborhoods
- Crime/safety data
 - (not city, neighborhood level)
- Public transportation routes
- Accuracy of GIS retail databases
- Resolution of maps
- Snapshot in time- conditions change quickly



Thank you!

Alyssa Ghirardelli, MPH, RD
Research Scientist
Network for a Healthy California
CA Dept. of Public Health
Alyssa.Ghirardelli@cdph.ca.gov
916-449-5342

