A satellite map of Los Angeles, California, showing major highways and city streets. A red pin is placed in the East Los Angeles area, near the intersection of E Washington Blvd and S Atlantic Blvd. The map is framed by a black circular border.

# Blood Lead in Young Children: Cumulative Impacts

Results of Analysis Conducted by the  
California Department of Public Health  
Presented by:

Gina M. Solomon, M.D., M.P.H.

Deputy Secretary for Science and Health  
California Environmental Protection Agency

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# Cumulative Impacts: Many Sources of Lead Add Up



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# Blood Lead Level (BLL) Analysis

## Background:

- CA law: All children in public programs must be tested at age 1 & 2
- All data e-reported to CDPH
- ~700,000 reports statewide annually
- Concentration is in micrograms of lead per deciliter of blood ( $\mu\text{g}/\text{dL}$ )
- Reporting threshold varies by lab



# Elevated BLLs in Exide Area



LA County does an investigation when a child has:  
One BLL > 20  $\mu\text{g}/\text{dL}$   
Two BLLs > 15  $\mu\text{g}/\text{dL}$

Number of children in the 8 zip code area around  
Exide with BLLs that triggered a health investigation by  
LA County in 2012:

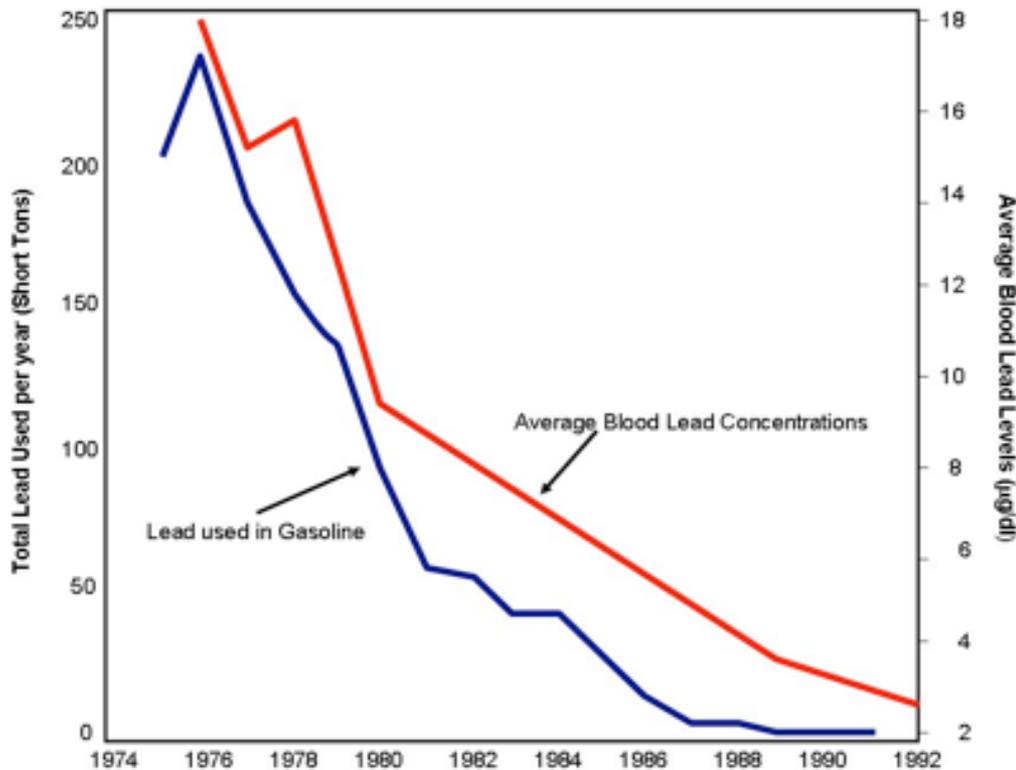
9 children

...but we're concerned about lower levels too.

Here's why:

# Historical Blood Lead Trends

Blood lead levels are much lower today than they were decades ago...



- ...but we now know more about low dose levels of lead:
- Historically known to be toxic at high blood levels over 40 µg/dL (anemia, abdominal cramps, seizures, encephalopathy, kidney damage)
- Now recognized as a subtle neurodevelopmental toxicant at levels below 10 µg/dL.

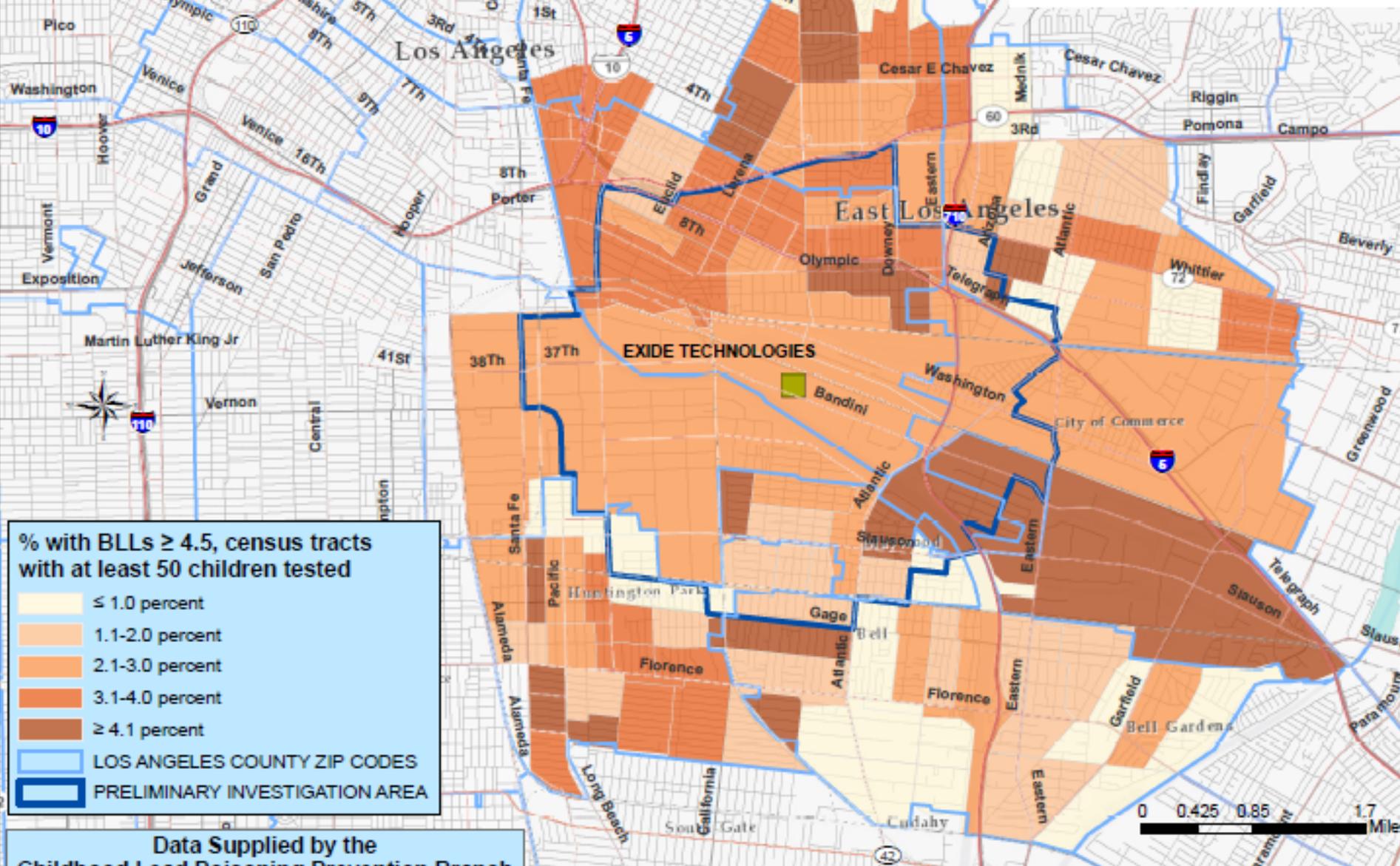
# CDPH Study

- 2012 data
- Children < age 6
- 11,702 children in the 8 zip codes (~100 census tracts) around Exide
- Percent of children with BLL  $\geq 4.5$  vs.  $< 4.5$   $\mu\text{g}/\text{dL}$
- Evaluated:
  - Distance
  - Direction
  - Child's age
  - Child's sex
  - Age of housing

**Percentage of Children under age 6 with Blood Lead Levels (BLLs)  $\geq 4.5$   $\mu\text{g}/\text{dL}$  in 2012**



Department of  
Toxic Substances  
Control



**% with BLLs  $\geq 4.5$ , census tracts with at least 50 children tested**

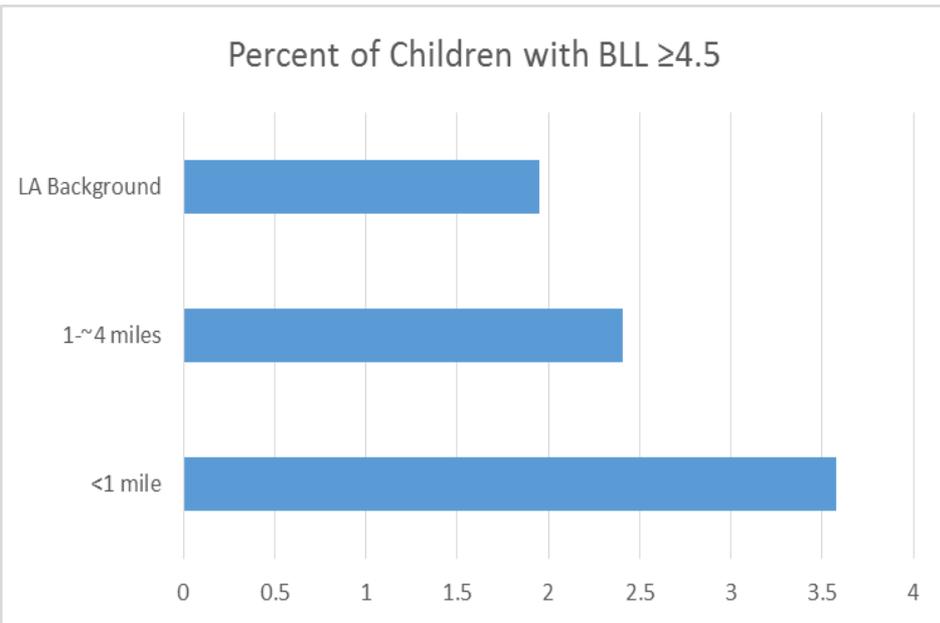
- $\leq 1.0$  percent
- 1.1-2.0 percent
- 2.1-3.0 percent
- 3.1-4.0 percent
- $\geq 4.1$  percent
- LOS ANGELES COUNTY ZIP CODES
- PRELIMINARY INVESTIGATION AREA

**Data Supplied by the  
Childhood Lead Poisoning Prevention Branch  
California Department of Public Health**

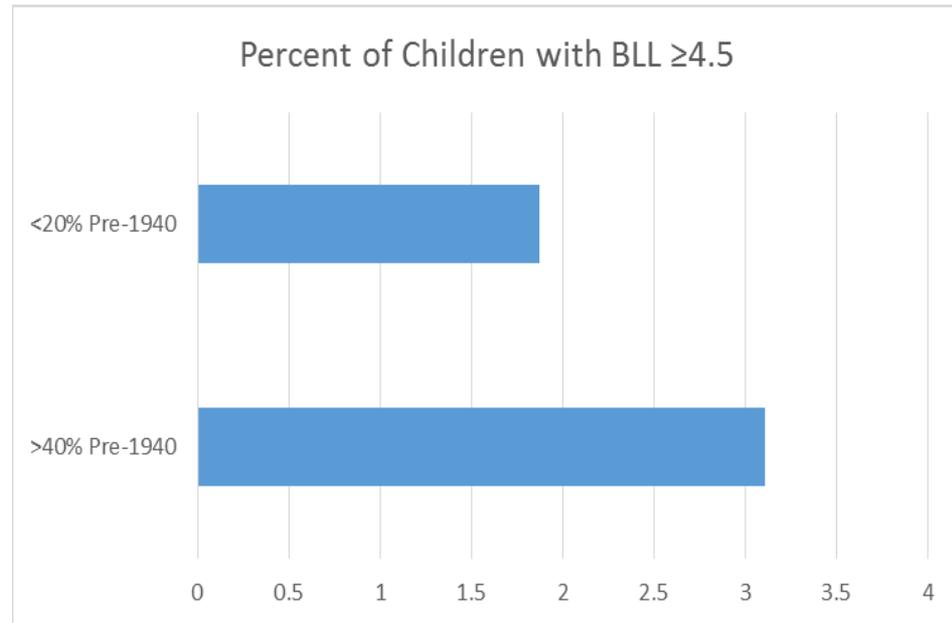
Sources: Esri, DeLorme, USGS, NPS, Esri, HERE, DeLorme, MapmyIndia, © OpenStreetMap contributors, and the GIS user community

# Distance Effect

## Simple Distance



## Age of Housing



.....but the two issues are correlated....

# When Age of Housing is Included...

- The effect of distance decreases a lot:
  - Two analyses: Census tract median age of housing, and sub-study with actual age of housing.
  - Both analyses showed 13-15% decrease in probability of a child having a BLL  $\geq 4.5$   $\mu\text{g}/\text{dL}$  with every mile further from Exide a child lived in 2012.
  - But not statistically significant.
- Conclusion: Lead exposure comes from many sources, and housing is very important.

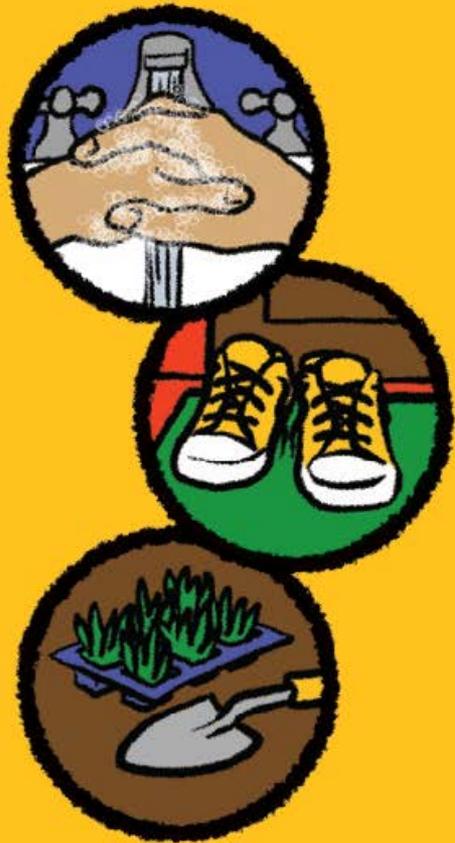
# Why Lead Testing Matters

- Rapidly identify any seriously affected families
- Get children and families any additional help they may need
- Quickly focus efforts on worst 'hotspots'
- Let parents know if their efforts are effective



# Protect Your Child from Lead in Dirt

Lead can harm your child. Dirt around your home could have lead in it. Keep your child safe from lead in dirt:



**Wash your child's hands and toys often.**

Always wash hands before eating or sleeping.

**Take off shoes or wipe them on a doormat**

before going into your home.

**Cover bare dirt outside where your child plays.**

Use grass or other plants, bark, gravel, or concrete.

**Fruit and vegetable gardens should be planted as far away as possible from busy streets and older buildings.**

Store-bought soil is best for growing food. Always wash all fruits and vegetables before eating.

Call your local lead poisoning prevention program to find out about testing the dirt around your home for lead.