"If I can't see it,
I can't understand it."
– Albert Einstein

GLOBAL CITY TEAMS CHALLENGE

NIST National Institute of Standards and Technology
U.S. Department of Commerce

Vision Architecture, Inc.

Constituent-led, Public Data & IoT Utility for Urban Health, Housing, and Environmental Hazard Management

Global Tech Jam – Portland, OR
June 20, 2018

Index

- Introduction to Vision Architecture, Inc.
  - Clients Projects
  - Background for Working in Oakland
  - The Use Case for Public Data & IoT Utility
- ***Constituent-led, Public Data & IoT Utility for Urban Health, Housing, and Environmental Hazard Management***
  - Cybersecurity & data governance for constituent Opt In data capture
  - Pilots for crowd sourcing health, housing, and environmental hazard data to create public safety data for all Oaklanders

Stated goals for NIST *"Constituent-led, Public Data & IoT Utility for Urban Health, Housing, and Environmental Hazard Management"* Action Cluster

- **Build upon a Smart City blueprint, playbook, and coalition of Oakland communities** to convene, share, and learn what's possible with data, IoT, and Smart Cities then use that knowledge to co-create projects and programs germane to each constituency, micro-community, and individual sets of needs

- **Leverage community coalitions to hunt and gather data for addition to a shared Public Data & IoT Utility** to be operated and run as a shared data service for micro-communities to build political will, grow businesses, and collective voice to be used to address micro- or meta-level risks and opportunities

- **Leverage people, processes, and technology** to collectively address issues of unsafe *Bay Area Housing Environments* to co-create inclusive solutions and investment opportunities to resolve the housing crisis and improve health region-wide – this model will be extensible to the nation

- **Focus on short and long-term positive outcomes associated with sustainable Smart City solutions**, and maintain a cadence of speed and success delivering projects to address current issues for constituents, businesses, and government agencies generated by past programs, policies, and investments like failing infrastructure, legacy lead poisoning, and institutionalized racism

Vision Architecture

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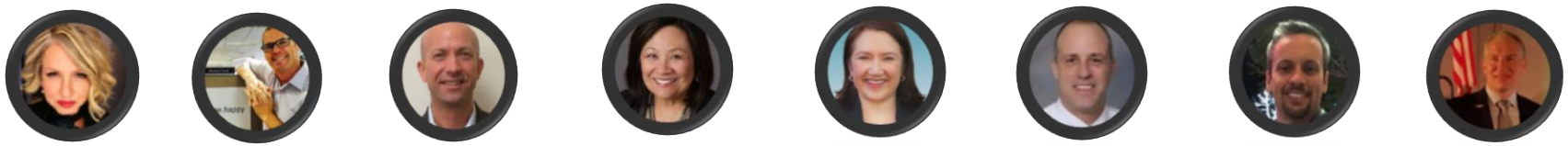
Background & Smart City Client Projects



20+ years Private & Public Sector Software & Consulting

Vision Architecture Clients & Endorsements

AAA Insurance
Allergan
AMGEN
bea
BIO-RAD
BOEING
CISCO
Cummins
EA
ExxonMobil Energy lives here
Genentech IN BUSINESS FOR LIFE
GM
Hertz
HITACHI Inspire the Next
Johnson Controls
lenovo
MOTOROLA
Nestle
NetApp
NORTHROP GRUMMAN
ORACLE
PG&E
Panasonic ideas for life
Roche
SAFEWAY
SDGE A Sempra Energy utility
SoCalGas
THOMSON REUTERS
Turner Construction Company
UNITED
vmware
Walmart

Alameda County Healthy Homes Department — 20 Years Making Homes Healthier for Children — Free Lead Paint Consultation & Repairs
COVERED CALIFORNIA
DFAS Your Financial Partner @ Work
ALAMEDA COUNTY PUBLIC HEALTH DEPARTMENT
GLOBAL CITY TEAMS CHALLENGE
CalPERS
Citizenship and Immigration Canada
CITY OF CHICAGO INCORPORATED 4th MARCH 1831
LADOT Moving Los Angeles Forward
OKLAHOMA HIGHWAY PATROL
Washington State Department of Transportation
UNITED STATES NAVY
OKLAHOMA OFFICE OF HOMELAND SECURITY
PIONEERED BY THE ROCKEFELLER FOUNDATION 100 RESILIENT CITIES
OKLAHOMA DEPARTMENT OF PUBLIC SAFETY
NIST National Institute of Standards and Technology U.S. Department of Commerce
CITY OF OAKLAND
ramp REGIONAL ASTHMA MANAGEMENT & PREVENTION — Working together to reduce the burden of asthma
RESILIENT OAKLAND
DEPARTMENT OF JUSTICE FEDERAL BUREAU OF INVESTIGATION
OKLAHOMA STATE DEPARTMENT of EDUCATION
The ROCKEFELLER FOUNDATION
SmartOakland
Women of Color On The Move
women'sinitiative

Vision Architecture's Projects

Smart City Integrated Vision with a Triple Bottom Line and Sustainable Solutions to Help Cities Grow

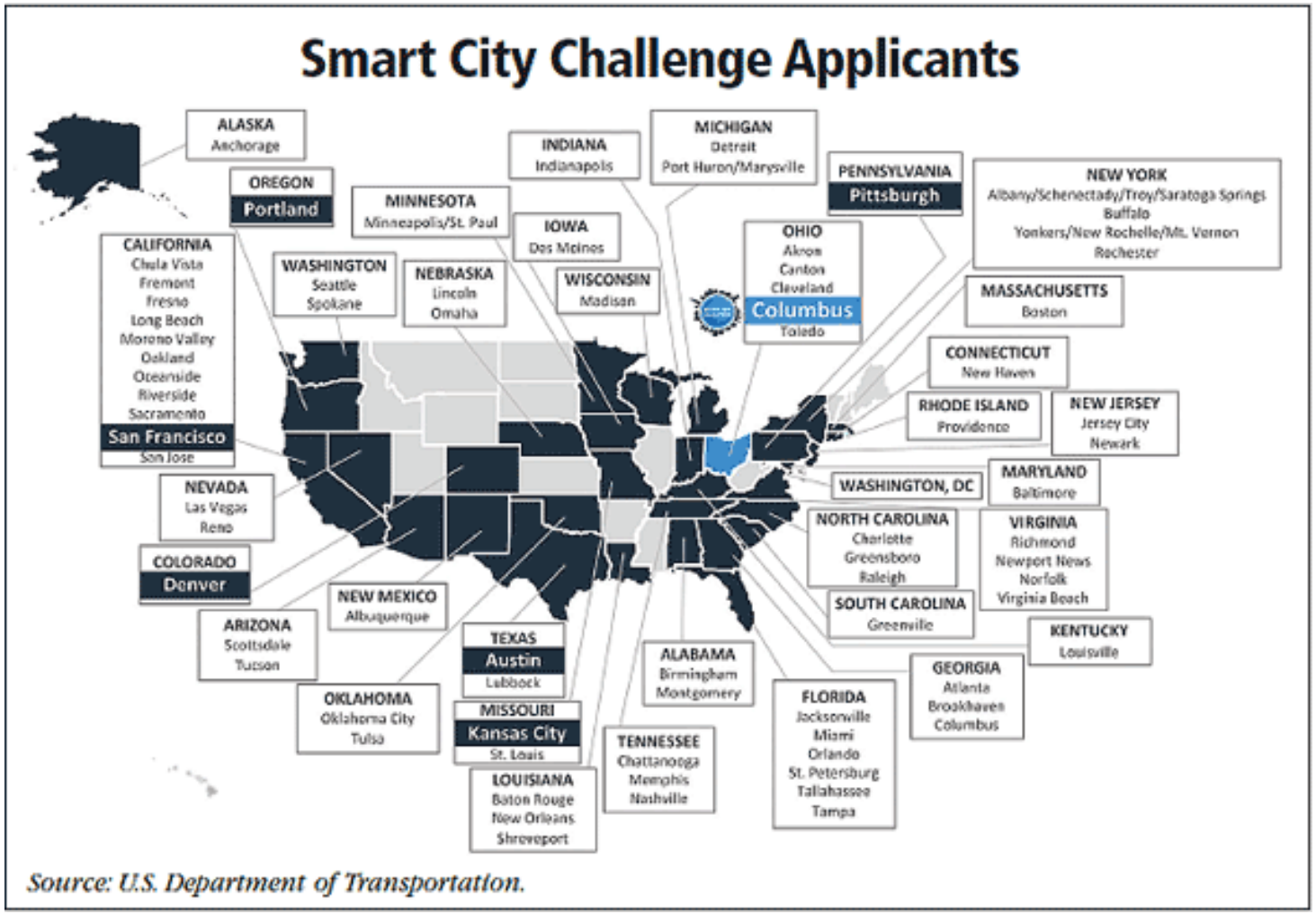
Over the past 20+ years Stephanie has defined vision and technology solutions for Fortune 1-500 corporations, Smart Cities, and Social Impact initiatives.

No other vendor provides cities with a full suite of guided and facilitated vision, Business Architecture, Cybersecurity governance, product capability roadmap and solution designs, project implementation plans, and KPI metrics to ensure private-, public-, and constituent service ecosystems are integrated into new business models - like the client projects here:

- **Smart State Public Safety & Emergency Response Systems** for Governor State of Oklahoma
- **Smart State Transportation** for Washington State Department of Transportation
- **Situational Intelligence for Tornado Emergency Response** for the State of Oklahoma
- **Smart Schools Emergency Response System for Active Shooters** for the State Oklahoma
- **Smart State Highway Patrol Trooper & Strike Team Response System** for the State of Oklahoma
- **Situational Intelligence for CA Earthquake Emergency Response** for Pacific Gas & Electric
- **The Future of Legal Publishing** for Thomson Reuters FindLaw
- **The Future of Telematics for Car Insurance** CA AAA
- **The Future of Global Game Development** for Electronic Arts
- **The Future of Customer Engagement** for Pacific Gas & Electric Company
- **The Future of Los Angeles** for the LA Department of Transportation
- **The Future of the Olympic Games Event Management in Los Angeles** for LA Department of Transportation
- **The Future of Customer Experience** for Hitachi
- **The Future of Work** for Johnson Controls Global Supply Chain
- **The Future of Global Emergency & Disaster Response for Employees** for Johnson Controls
- **The Future of Biopharma e-Commerce** for Bio-Rad
- **The Future of Online Customer and Doctor Engagement** for Roche & Genentech
- **The Future of Video Evidence Collection** for Panasonic
- **Future State Intelligence Internal Operations** for Boeing
- **The Future of Smart City Transportation** for the Oakland Department of Transportation
- **Rockefeller 100 Resilient Cities Resilient Oakland** Engaging Youth in Shaping the Future of Oakland
- **The Future and Next Generation** of the U.S. Navy
- **The Future of Global Channel Partnerships** ExxonMobil
- **The Future of Global Drug Safety** Operations for Amgen
- **The Future of Construction Education** for Turner

CITY OF OAKLAND

2016 City of Oakland asks Stephanie, Vision Architecture, to help create crowd-sourced response to Federal DOT Smart City Challenge…



CITY OF OAKLAND

2016 City of Oakland asks Stephanie, Vision Architecture, to create Vision of the Future of Oakland by engaging the constituency in Digital Transformation

RESILIENT OAKLAND

Takes a town to thrive

Collaborative.
Data-driven.
Equitable.

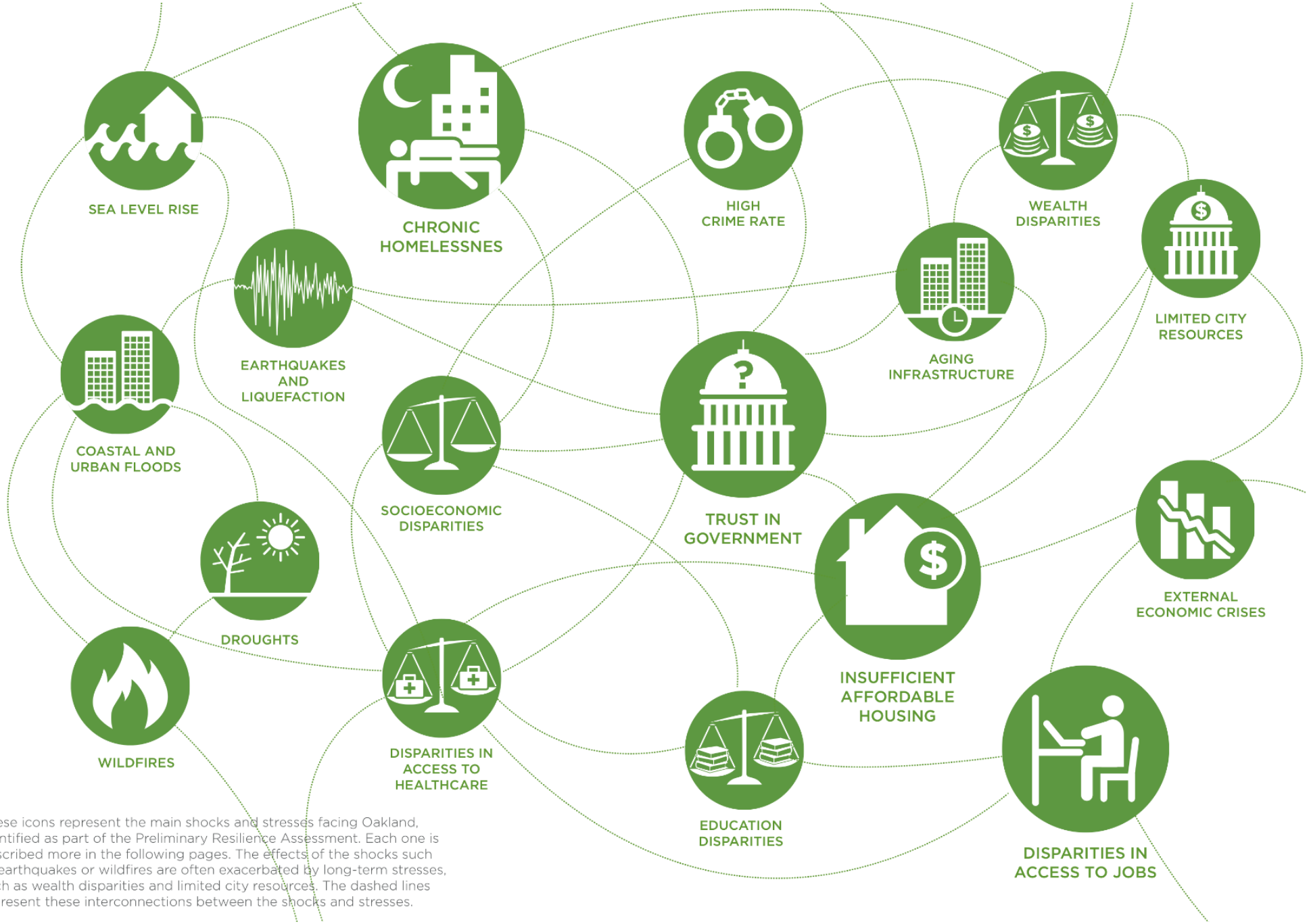
About 100 Resilient Cities

Pioneered by the Rockefeller Foundation, 100 Resilient Cities (100RC) is dedicated to helping cities around the world become more resilient to the physical, social, and economic challenges that are a growing part of the 21st century. 100RC supports the adoption and incorporation of a view of resilience that includes not just the shocks—earthquakes, fires, floods, etc.—but also the stresses that weaken the fabric of a city on a day to day or cyclical basis. By addressing both the shocks and the stresses, a city becomes more able to respond to adverse events, and overall, is better able to deliver basic functions in both good times and bad, to all populations. Oakland was accepted into first wave of cities in the 100 Resilient Cities network, alongside Berkeley and San Francisco in the Bay Area. The three cities, led by their respective Chief Resilience Officers, have been collaborating to leverage regional efficiencies for their strategy development processes, where possible, and will continue to collaborate on implementing their resilience strategies.

PIONEERED BY THE ROCKEFELLER FOUNDATION
100 RESILIENT CITIES

The Fox Theater originally opened its doors in 1928 as an elaborate movie palace, and serves as a symbol of resilience. It shuttered in 1966 and remained closed for 40 years, surviving a fire and an earthquake, and escaping the wrecking ball before being restored to its former splendor, reopening in 2009 as part of the renewal of the Uptown theater and arts district.

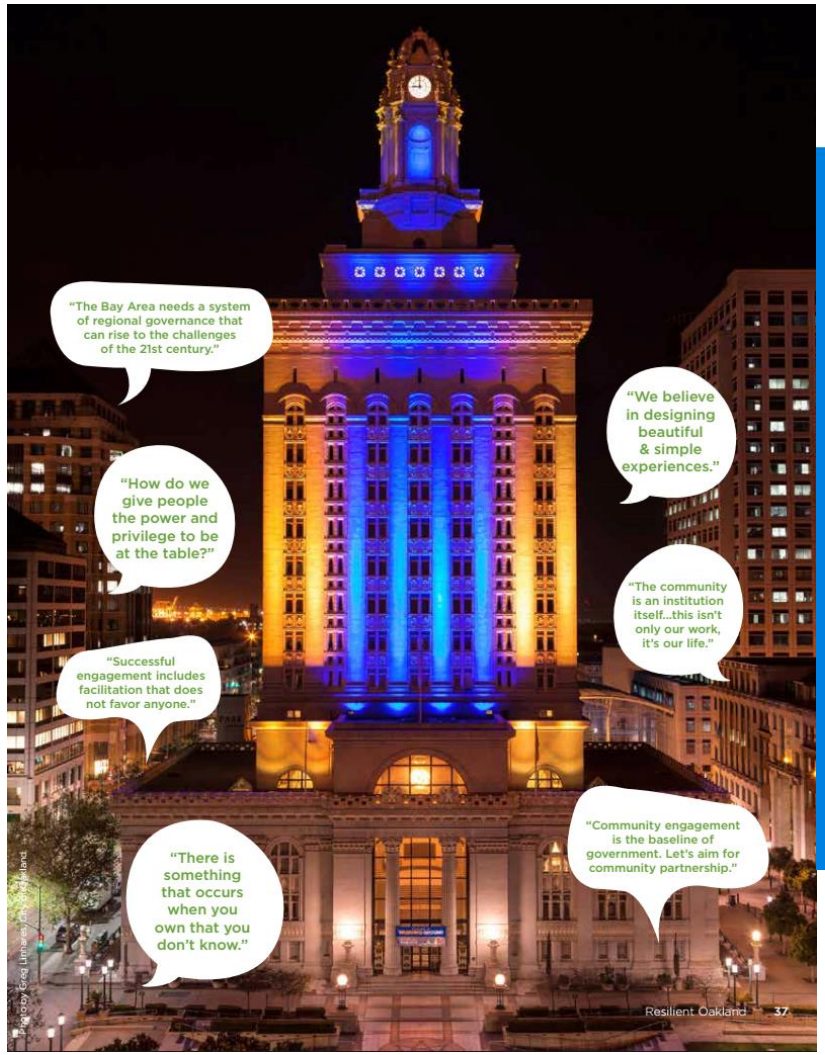
RESILIENCE CHALLENGES AT A GLANCE

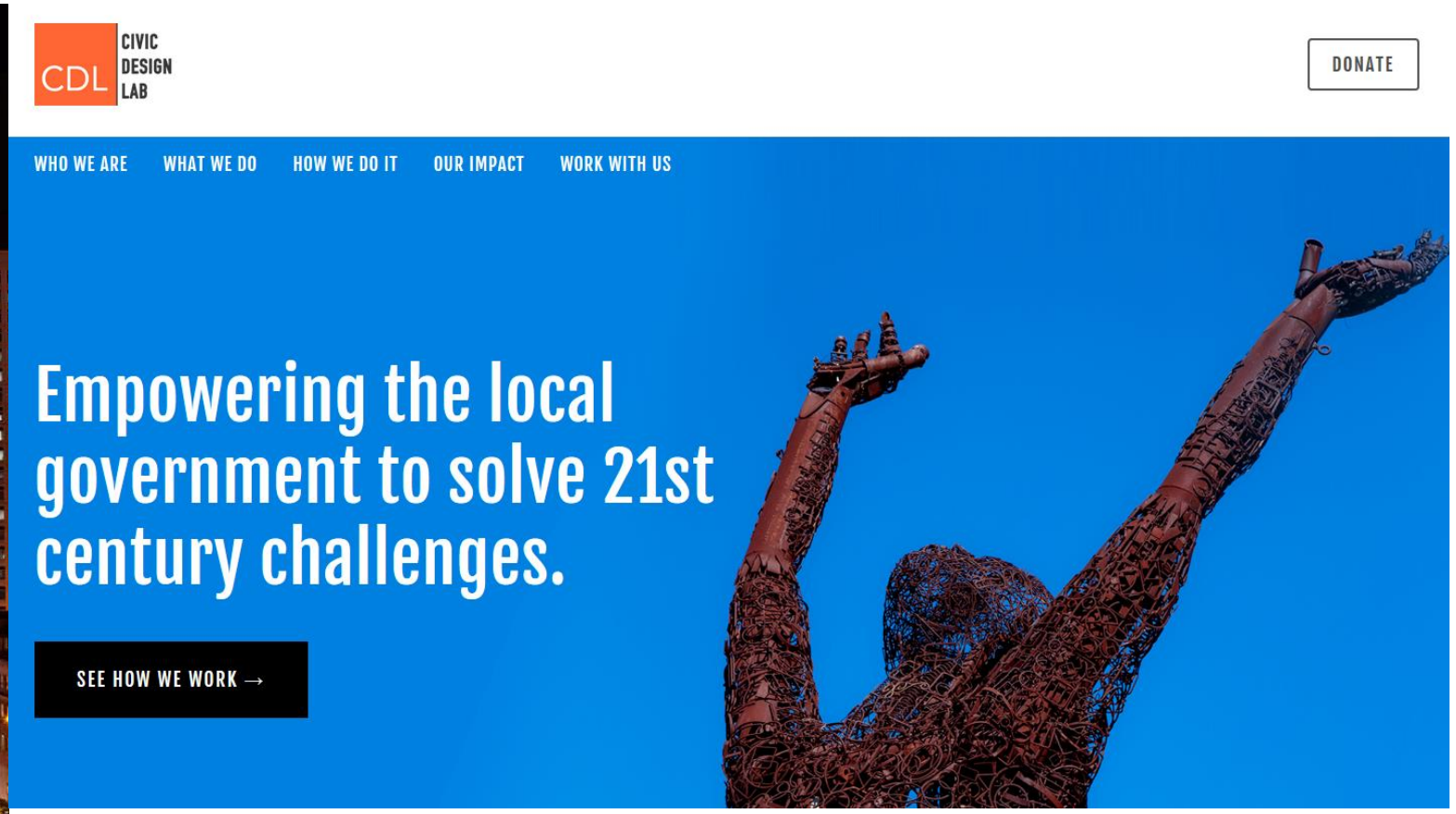


These icons represent the main shocks and stresses facing Oakland, identified as part of the Preliminary Resilience Assessment. Each one is described more in the following pages. The effects of the shocks such as earthquakes or wildfires are often exacerbated by long-term stresses, such as wealth disparities and limited city resources. The dashed lines represent these interconnections between the shocks and stresses.

CITY OF OAKLAND

2016 City of Oakland's Michael Ford in the new DOT and Stephanie of Vision Architecture begin actively engaging the constituency in Digital Transformation





CITY OF OAKLAND

2016/2017

Shocks Come to Oakland
Work gets very serious

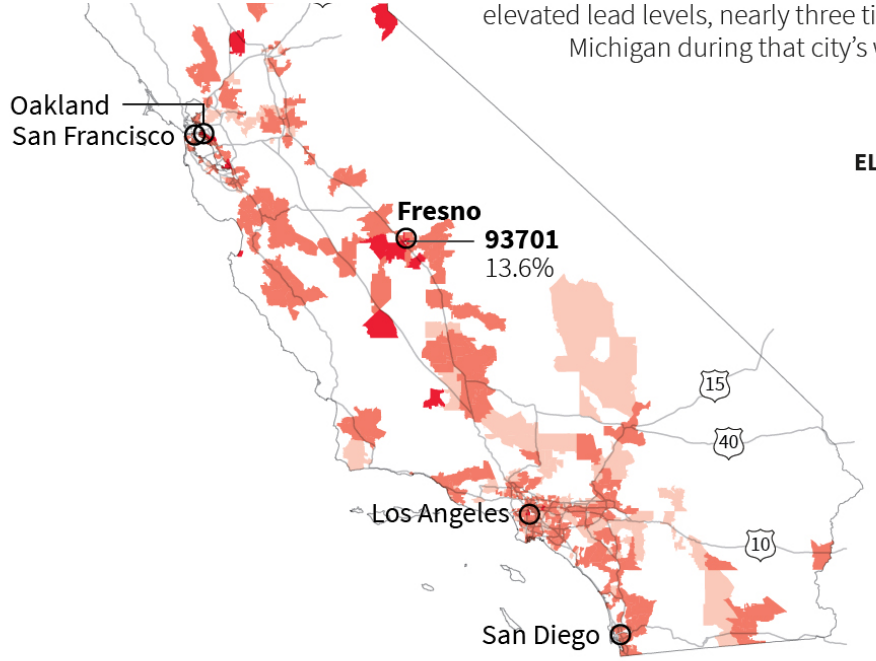
CITY OF OAKLAND

2016 City of Oakland is hit by two major health, housing, and environmental shocks to the constituency, businesses, and government – fires & lead poisoning

1. Ghost Ship Fire in Fruitvale kills 36
2. Lead poisoning Fruitvale is 4xs worse than Flint, MI
3. No housing safety & building inspection data
4. No centralized data to alert constituency of imminent danger

Lead exposure in the Golden State

ildhood lead poisoning is often associated with :ricken neighborhoods in the Rust Belt and East ewly released data shows many neighborhoods ia also have lead exposure problems which can en with life-long health impacts. In the worst hit de in Fresno, 13.6 percent of children tested had elevated lead levels, nearly three times the rate found in Flint, Michigan during that city's water contamination crisis.



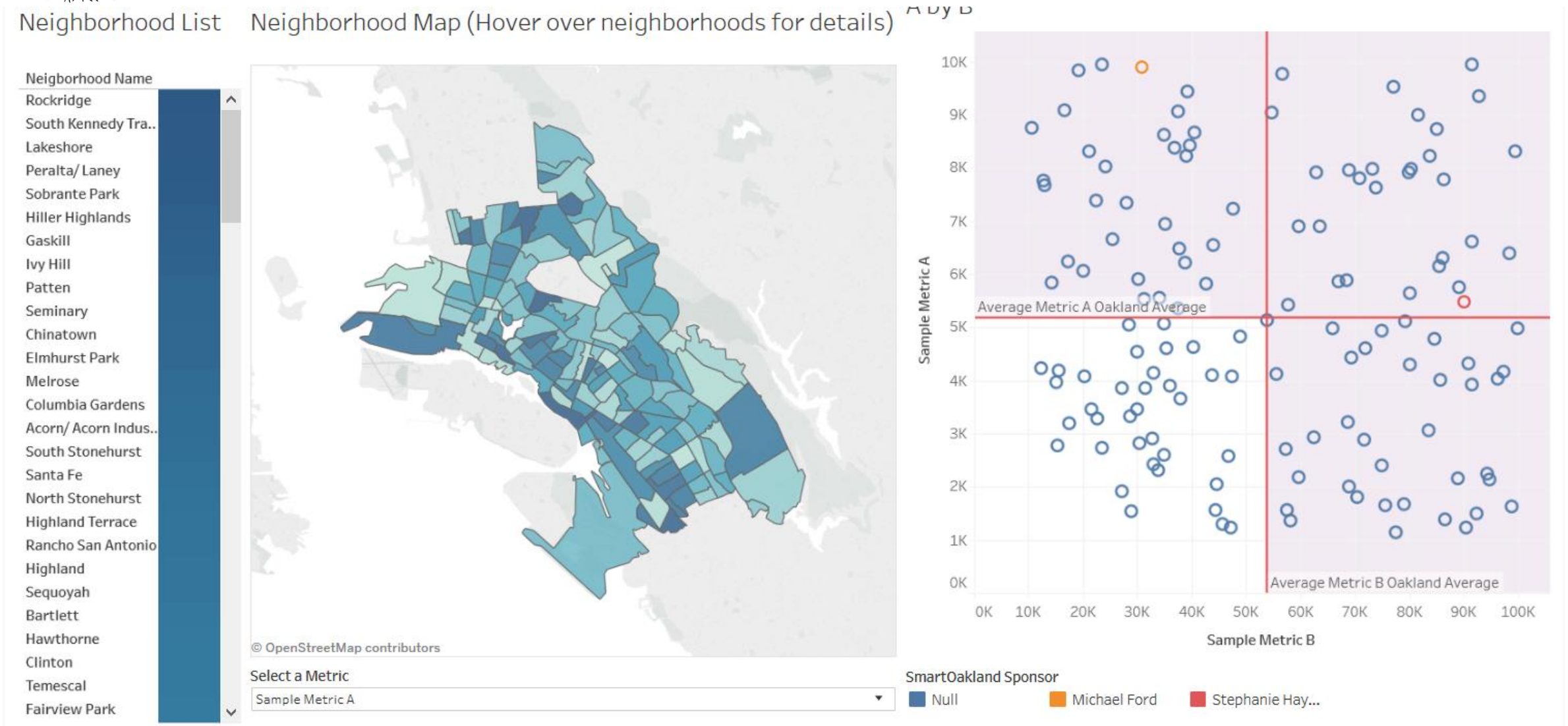
C. Chan, M.B. Pell 21/03/2017 REUTERS

"If I can't see it,
I can't understand it."
– Albert Einstein

Use Case – Data for Safety

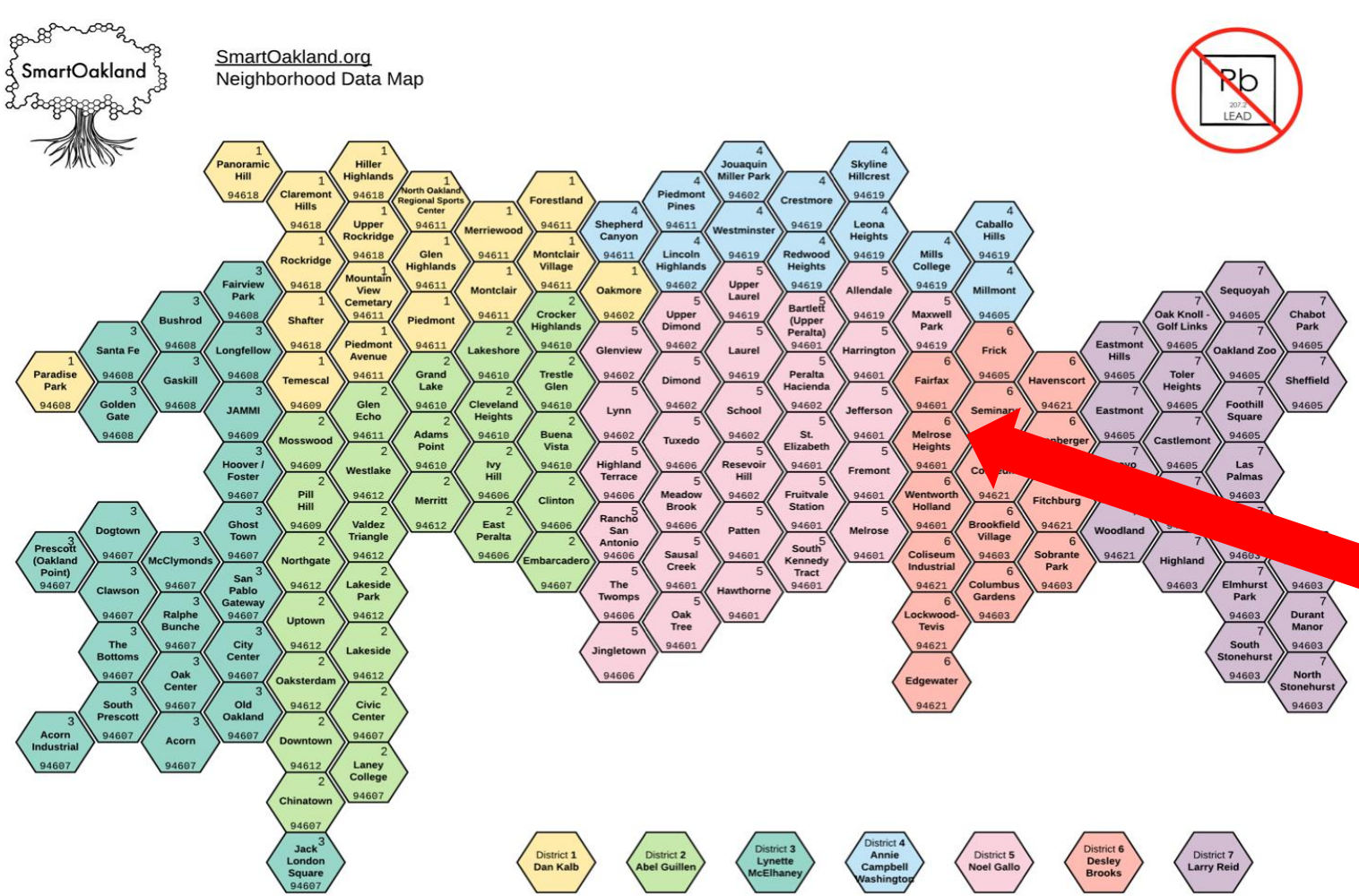
Crowd source housing, health & environmental hazard data for lead paint poisoning locations and share publicly to protect constituency, gain resources for lead abatement, and incentivize energy efficiency & revitalization projects in micro-communities

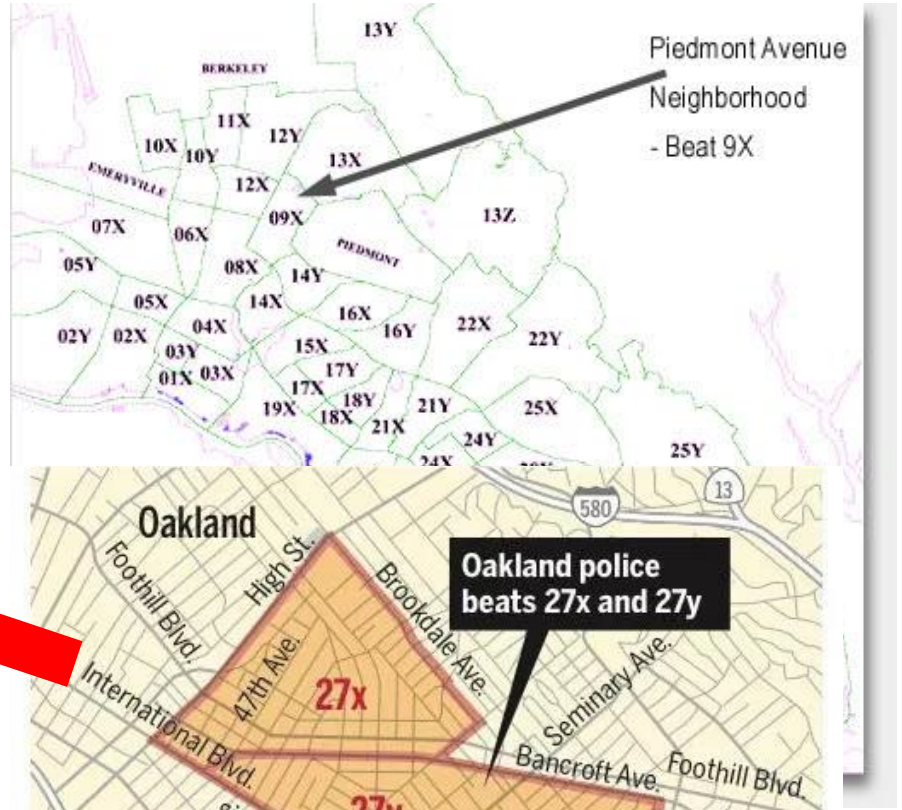
2017 Stephanie co-founds SmartOakland with City of Oakland DOT Transportation & Mobility Manager, Michael Ford, to engage the constituency to crowd-source health, housing, and environmental hazard data, at micro-community level, to begin Digital Transformation



2017/18 Stephanie creates crowd-sourcing blueprint, built upon existing human networks, and created a Cybersecurity-focused, data literacy initiative, to help people locate lead poisoning and warn the constituency of unsafe locations using data & IoT devices

The Oakland Neighborhood Map is used to create a visual data mapping tool to describe micro-community data taxonomies, in a beehive structure, and represent data we have and data we need to collect from Oaklanders

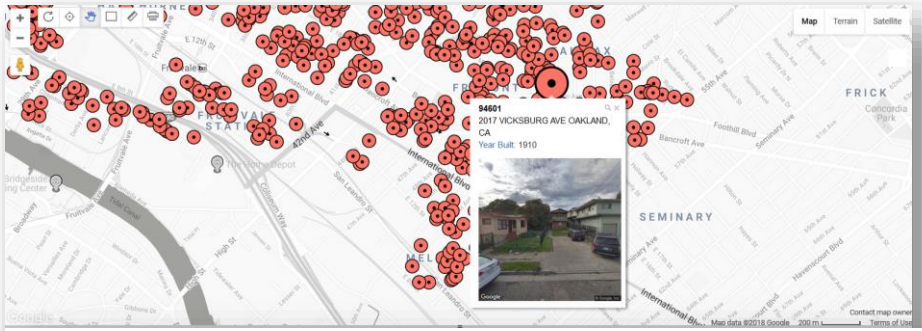


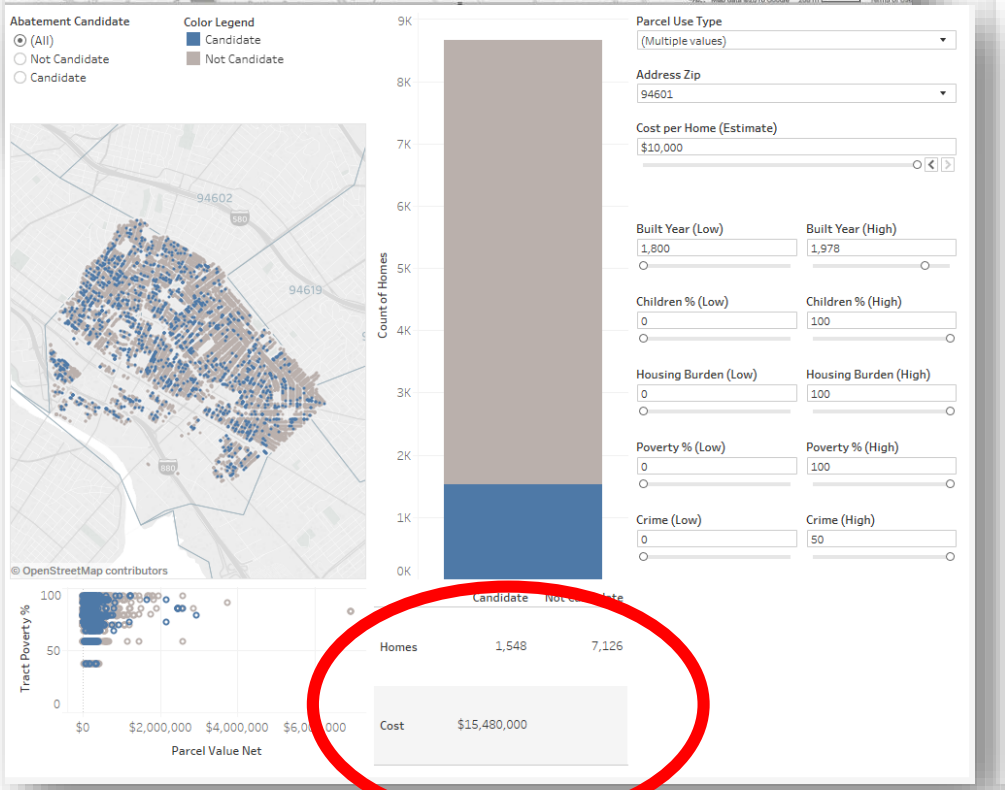


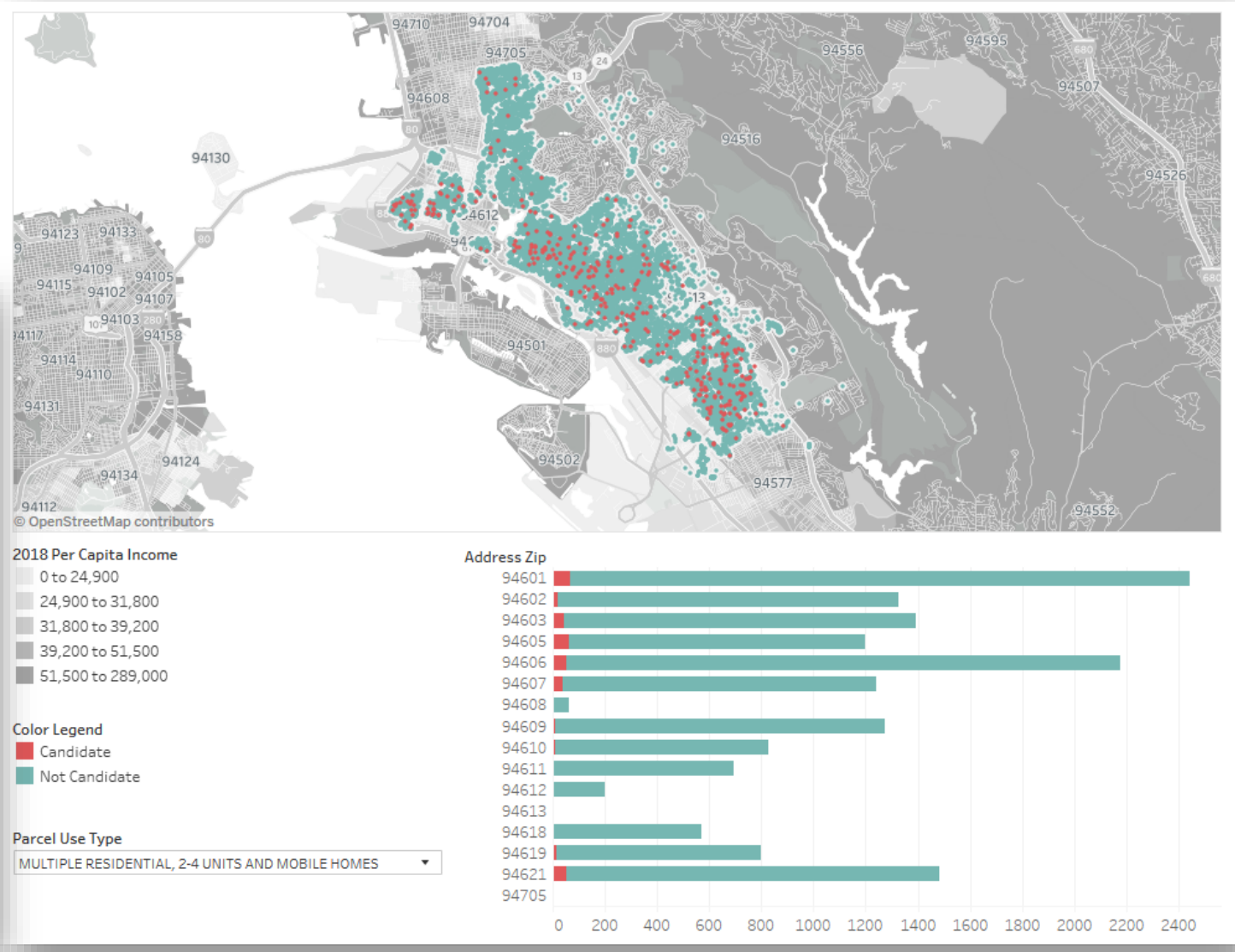
www.smartoakland.org
510-833-6591
inquiries@smartoakland.org

Join Us for our monthly SmartOakland Smart City Meetups Every 3rd Thursday
6-8pm Oakland City Hall, Civic Design Lab, 1 Frank Ogawa Plaza, 9th Floor, Oakland, CA 94612
https://www.meetup.com/Vision-Architecture-Smart-Cities-Smart-Data-IoT-Meetups/

We are now able to **predictive** where At Risk children 6 and under are located, down to the apartment #, by Zip Codes, income levels, and likelihood of becoming lead poisoned this year…including costs & financial returns on performing lead abatement of entire Zip Codes – *see more about what this data is on the following slides*





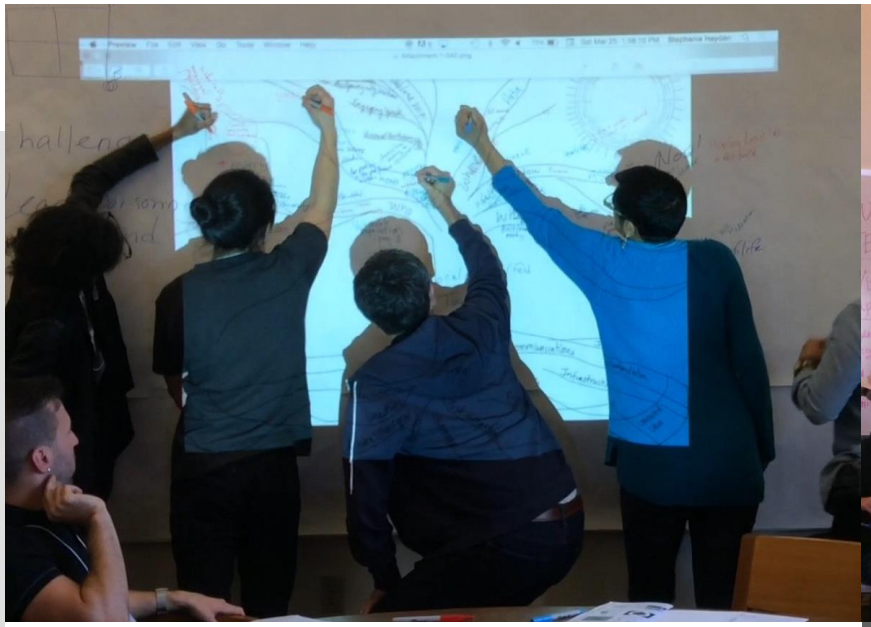


CITY OF OAKLAND

Cybersecurity & Opt-in Data Collection Process

How do we do it & what does the data mean?

Constituent-led Smart City Solution Designs



CDL CIVIC DESIGN LAB

WHO WE ARE WHAT WE DO HOW WE DO IT OUR IMPACT WORK WITH US

Empowering the local government to solve 21st century challenges.

SEE HOW WE WORK →

SmartOakland

PROJECTS TEAMS STORIES
NEIGHBORHOODS FUNDING SUPPORT
ACTION CLUSTERS NEWS & MEDIA LEARN
EVENTS CITIES FIGHTING THE LEAD WAR
SITE MAP

CART (0)

WE ARE A CONSTITUENT-LED, SMART CITY, NON-PROFIT

Who We Are

NIST National Institute of Standards and Technology U.S. Department of Commerce
GLOBAL CITY TEAMS CHALLENGE
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SmartOakland Recognized by U.S. Dept. Commerce National Institute of Standards & Technology for Smart City Public Data & IoT Utility

Read More →

Our Focus

We care about Getting the Lead Out of Oakland and Sharing How We Do It

Read More →

Breaking News

Steph Curry of Golden State Warriors Does a PSA for Getting Lead Out of Drinking Water in Oakland Schools

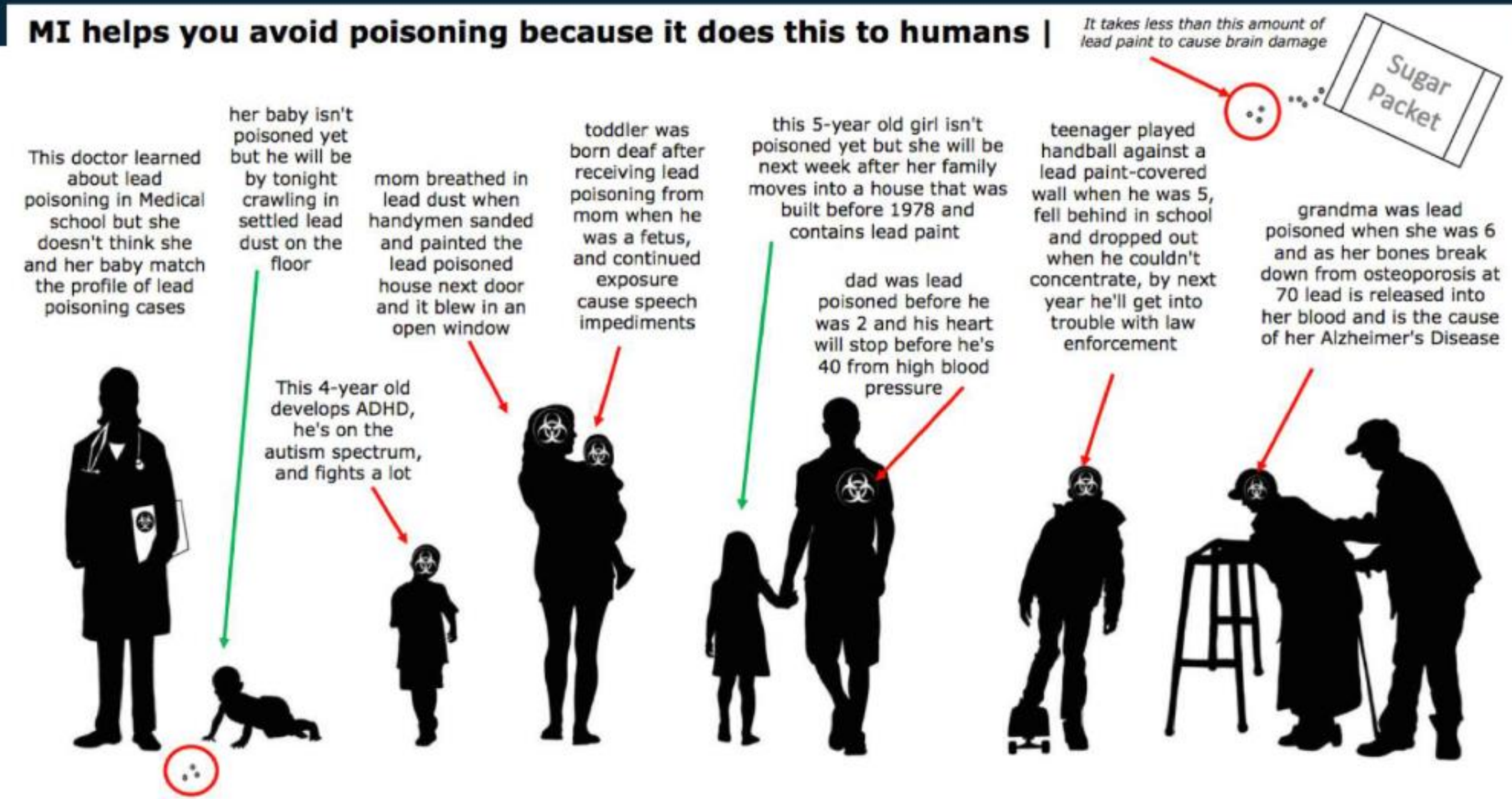
Read More →

Stories You Need to Hear...

KALW: Persistent Poisoning Part 1: Living with Lead Poisoning

Read More →

Lead poisoning is really bad for you.



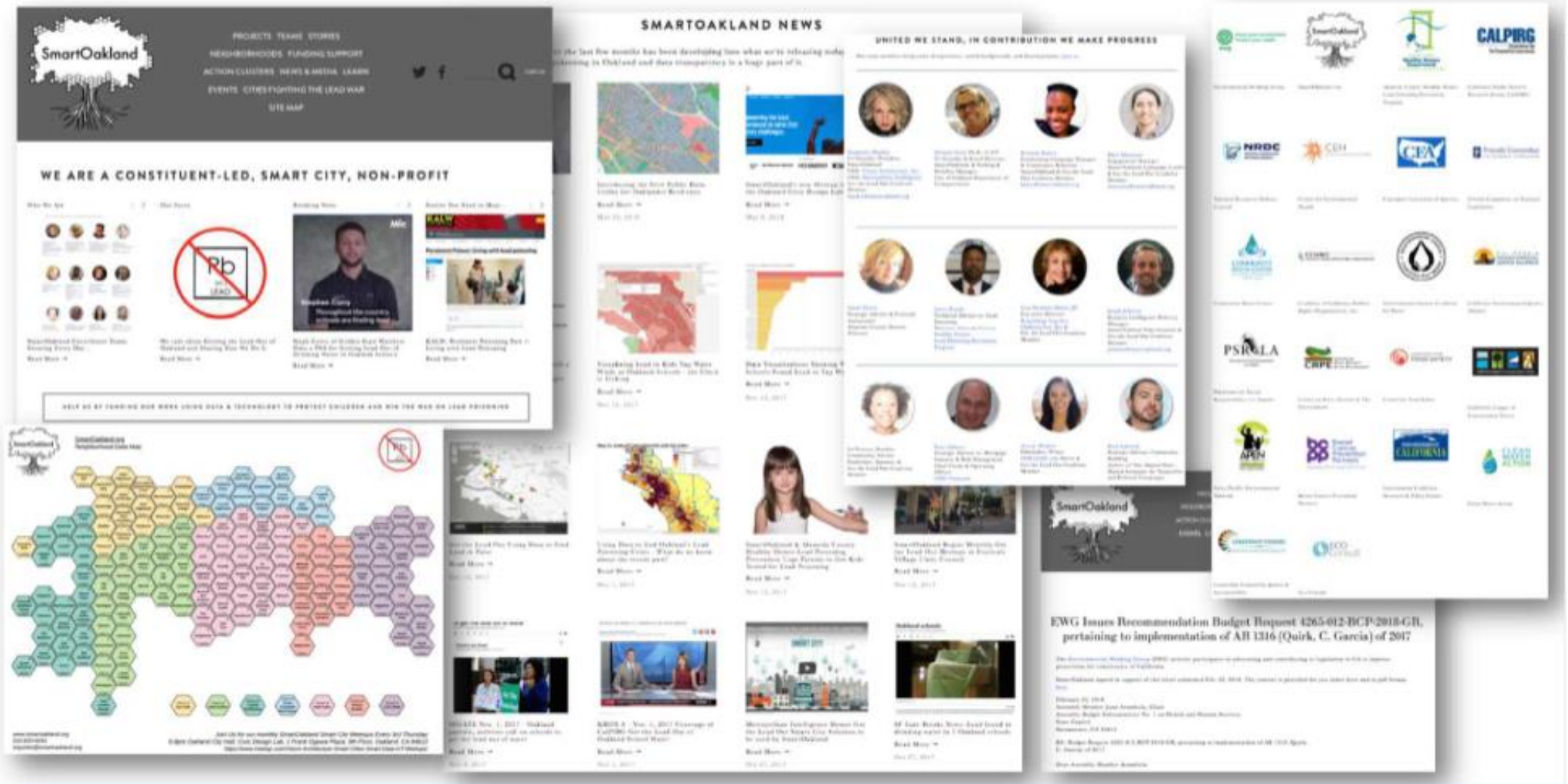
The problem with lead poisoning is it's invisible and will cut your life in half…

4000+ cities have 98M pre-1978 housing units poisoning humans of all ages

- **Inability to stop daily, avoidable, home lead poisonings across the U.S.**
  - Inability to determine how and where people are being poisoned
- **Inability to find at-risk children before they are lead poisoned**
- **Inability to orchestrate resolution of health and housing lead abatement between public-, private-, and non-profit organizations**
- **Inability to prosecute accountable parties quickly**
  - Lack of regulatory controls and policy compliance for housing safety

SmartOakland.org is using the Data Utility to find lead poisoning risks in all Zip Codes, prioritizing kids…

Get the Lead Out Coalitions. | SmartOakland is non-profit using data & IoT to connect Oakland to Win the War on Lead



SmartOakland

PROJECTS TEAMS STORIES

NEIGHBORHOODS FUNDING SUPPORT

ACTION CLUSTERS

EVENTS CITIES FIC

SIT

- FUND SMARTOAKLAND OPERATIONS
- FUND ZIP CODE PUBLIC DATA UTILITY
- CHILD LOCATOR ZIP CODE PUBLIC DATA UTILITY
- SMARTOAKLAND HEALTHY HOMES ACHHD 10-UNIT PILOT
- CONTACT US WITH SUPPORT IDEAS

CART (0)

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SmartOakland

USER PROCESS FLOW FIND IT. FUND IT. FIX IT.

1 FIND IT

Health — Share results?

a

- get **blood tested** for lead exposure
- make a lead poisoning health mitigation plan
- decide whether to move forward with next steps

Home — Share results?

b

- get **house tested** for presence of lead
- make a lead poisoning abatement & mitigation plan
- decide whether to move forward with next steps

Regulations — Share Results?

c

- **know your rights** for health safety in housing
- know your rights in housing and habitability legislation
- decide whether to move forward with next steps

2 FUND IT

Health — Share results?

a

- tenants pays for health damages on own or with health insurance
- landlords / real estate owner pays for health damages
- decide whether to move forward with next steps

Home — Share results?

b

- tenant & landlords qualify Federal lead abatement $
- tenants & landlords pay or seek other options for funds
- decide whether to move forward with next steps

Regulations — Share Results?

c

- assess **who's financially responsible** for **health damages**
- assess **who's finanicially responsibly** for **real estate asset damages**
- decide whether to move forward with next steps

3 FIX IT

Health — Share results?

a

- get health & **blood re-tested** for lead every **6 months**
- monitor lead poisoning health mitigation plan
- adopt sustainable plan to monitor health moving forward & throughout life

Home — Share results?

b

- find and book lead-safe certified contractors to fix house to make it habitable
- use regulatory systems to ensure all work is scientifically proven lead-safe
- adopt sustainable systems to monitor home safety forward

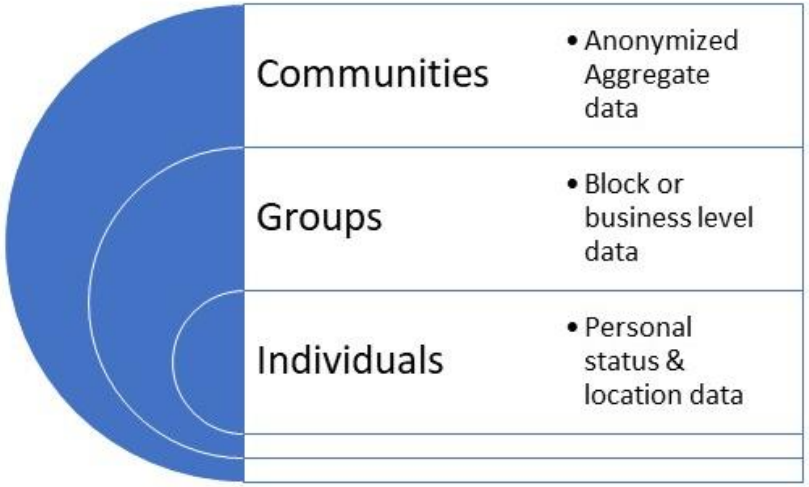
Regulations — Share Results?

c

- impose fines and ensure compliance with healthy homes regulatory safety
- adopt **Proactive Rental Inspection** control program to ensure Public Safety in city
- impose lead abatement injunctions in related housing

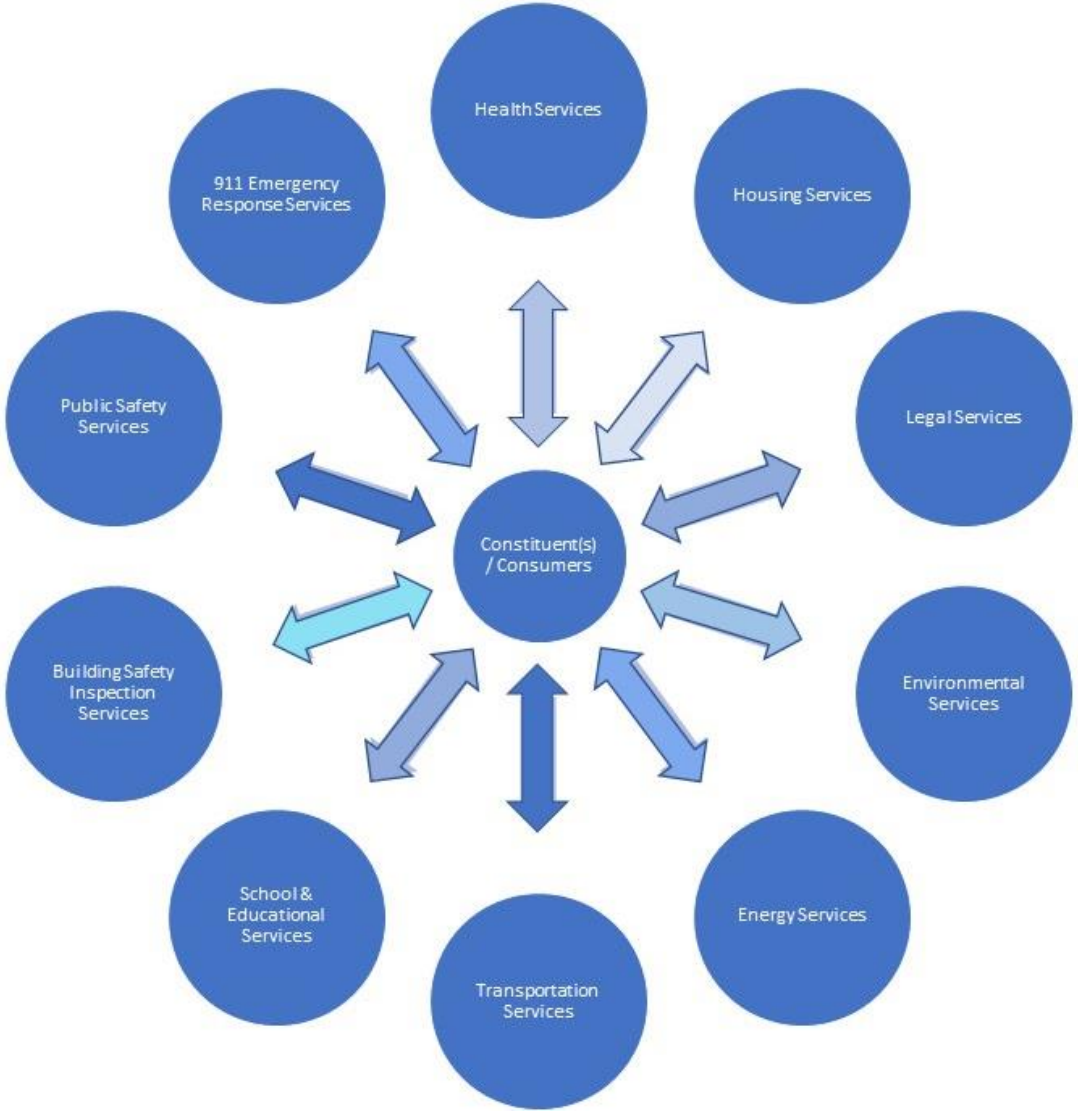
SmartOakland

2018/9 Cybersecurity-focused, data literacy initiative, to help people understand data, privacy, the value of owning & controlling your own data and what sharing critical data with the public can do



Some initial issues to discuss and consider:

- How useful is anonymized data for delivering real-time services to individuals and groups?
- Who should have access to specific data types and how long should they retain they retain it?
- Which types of technology services and human processes can be used to manage Cybersecurity threats for each data sharing agreement?
- How much data can one entity control and should any one entity control all data access and delivery?
- Pros and cons of data integrations and transparency initiatives in context of Cybersecurity threats.



SmartOakland

2018/9 Cybersecurity-focused, data literacy initiative, to help people understand data privacy & risk

Smart City Vision, Strategic Planning, & Digital Transformation Methodology

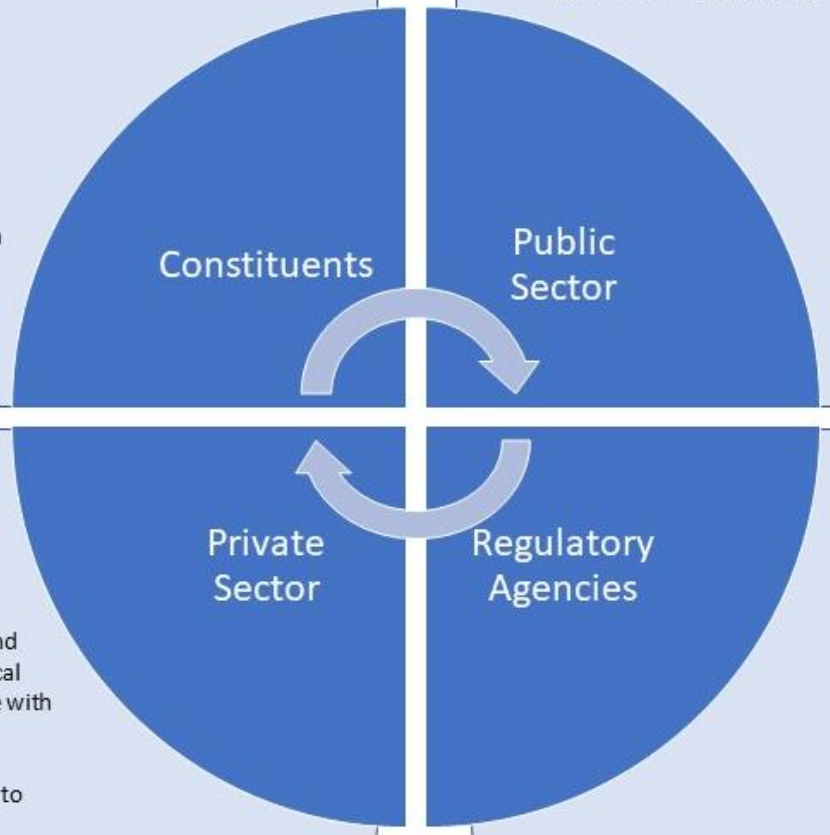
Cybersecurity landscape and data privacy perspective with intersections and collision points

Don't track me but give me great products and services!

- Individual freedom and personal anonymity
- Independence from govt. services
- Dependence upon govt. services
- Ability to receive commercial-grade technology services for low or no fee
- Ability to easily receive high value products and services in immediate context of need for those services
- Ability to be forgotten and remove all personal data from commercial and government systems
- Ability to retract data from systems in a useable format in a timely manner
- Ability to add requirements to surveillance policies

We need to track people to maintain societal order and grow new revenue streams to support city services.

- Delivering complex services to 10s of 1000s of individuals on a daily basis
- Public Safety & Asset Protection
- Constituency Surveillance & Data Privacy Protections
- Open Data & Data Transparency while complying with HIPPA, ADA 508, and GDPR
- Vision and projects to address data usage and policies are not in sync with daily change in constituency needs
- Internet of Life Saving Things will save lives and require massive data governance policy creation & automation
- Ability to survive as a city when old business models stop generating revenue to keep the city running



If you're not paying YOU are the product.

- Hunt and capture as much data about individual behavior as possible and use it to make money
- Create high resolution profiles about constituent and consumer behaviors to market products, run political campaigns, and drive large-scale behavioral change with learnings derived from this data
- Sell the data to whomever has money to buy it
- Ability to exclude individuals from equitable access to services based on backgrounds, ethnicity, political affiliations, economic status, and other characteristics

Stop tracking people without their knowledge!

- Create legislation that mandates Cybersecurity policies and procedures protecting consumers and constituents
- Work to educate and bring public-, private-, and non-profit sectors up to date on what is reasonable use of data
- Enforce compliance when constituents and consumers are tracked or surveilled without their permission
- Let people remove their data from third party systems
- Automate systems to allow people to be forgotten within commercial & government networks
- Protect the rights to privacy for the constituency

What does the data mean and how reliable is it?

Data Maturity Model for Constituent-led Public Data & IoT Utility

Predictive
Level 1 Data

- Descriptive data
  - Past data
  - Present data
- Predictive models
- Interviews & stories

User Validated
Level 2 Data

- Block Captains use Predictive data to check in with occupants and add data to MI GTLO app & on paper for people not using the Internet
- Block-by-block, door-to-door User contributed **Opt In** data facilitated by existing, trusted, neighborhood leaders & language translators
- Test people's blood for lead
  - Post data in MI Data Utility – choose to share externally
- Test house for lead with DIY test for quick insight to results – these are not formal or validated yet
  - Post data in MI Data Utility – choose to share externally to Public-facing data dashboards or keep private

Scientific
Level 3 Data

- Wifi-enabled Scientific toxic element scanner for lead poisoning
- Connected devices in the field post data to MI Data Utility with nationally EPA-certified lead inspectors
- If user paid for scientific scan and they own the property they can choose to publish it as well
- Future data may post automatically to MLS listings or Tax Assessor offices to alert public of safety hazards

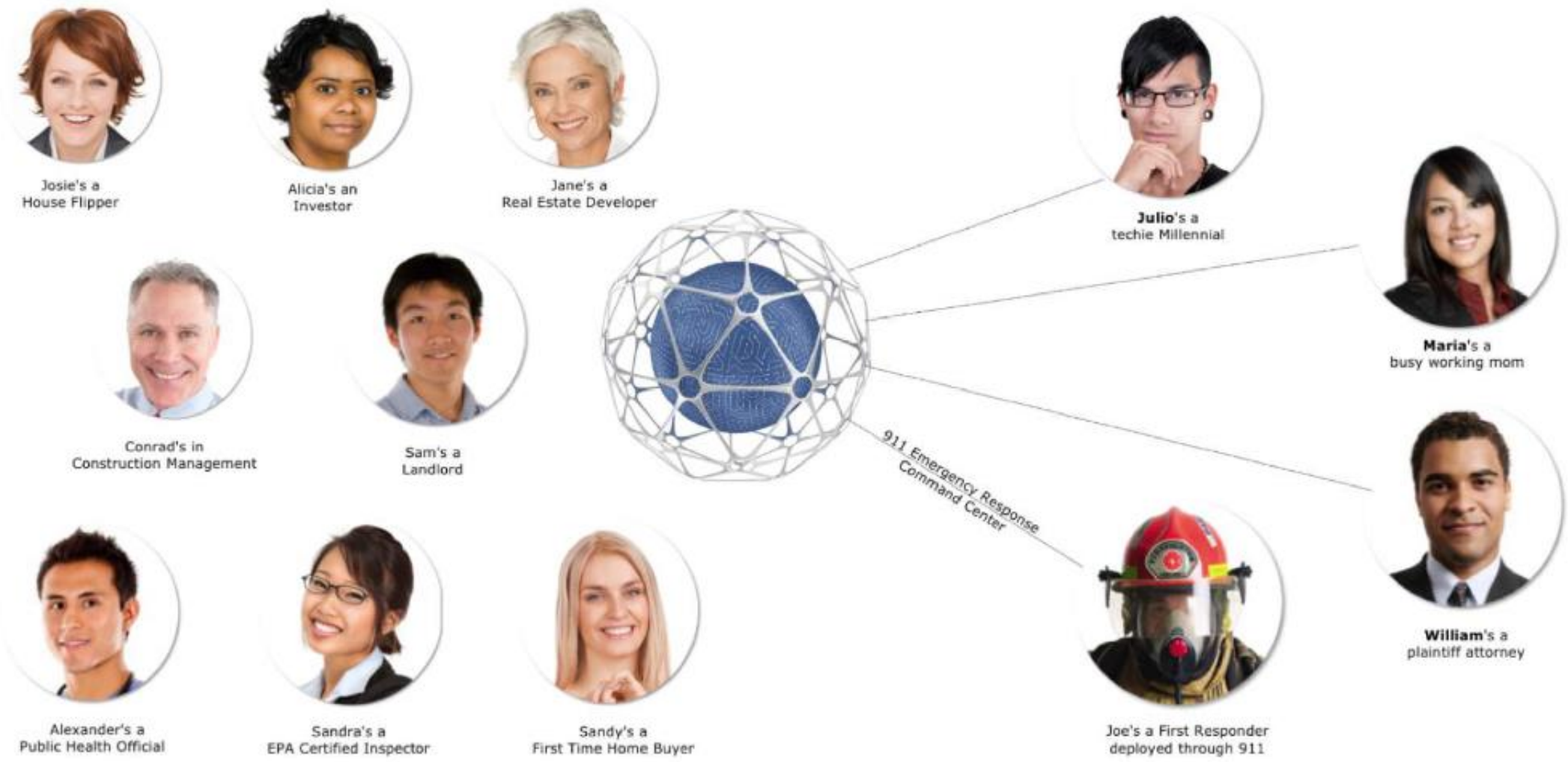
CITY OF OAKLAND

User Stories

What does the secured or open data enable?

Some user stories for our Data Utility…

Here's how people will use MI | Let's see Julio, Maria, William, and Joe's stories using MI | HOME, LAW & 911

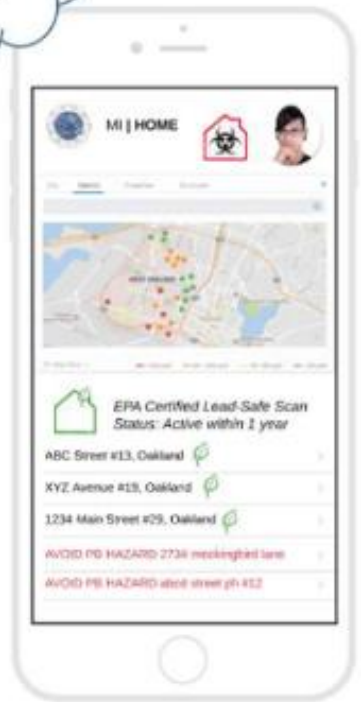


Consumers find lead-safe housing…

Julio uses MI to decide which home to rent. | Lead poison is invisible but MI's XRay vision sees it for you

Julio loves Oakland but heard there was lead poisoning in some of the houses.

He uses MI HOME to check apartments for lead-safe scans and chooses a home from the safe list.



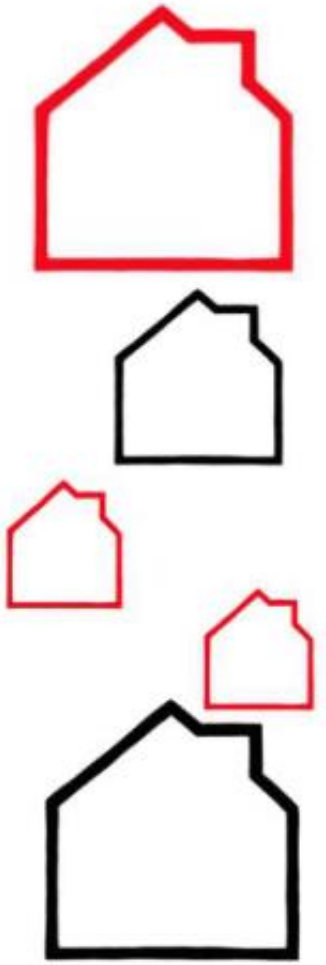
Find lead where you already live…

Maria uses MI to gather evidence and find a lawyer for her family. | Someone needs to pay for damages

Maria learned about lead poisoning the hard way. Her son, Billy, was hospitalized from lead poison he absorbed while breathing the air and dust in the apartment they just moved into.

She's using MI HOME to find lead sources, fund her health and housing costs, and fix the lead problem in her apartment with help from her new lead poisoning plaintiff and Tenants Rights attorneys.

William's a plaintiff attorney

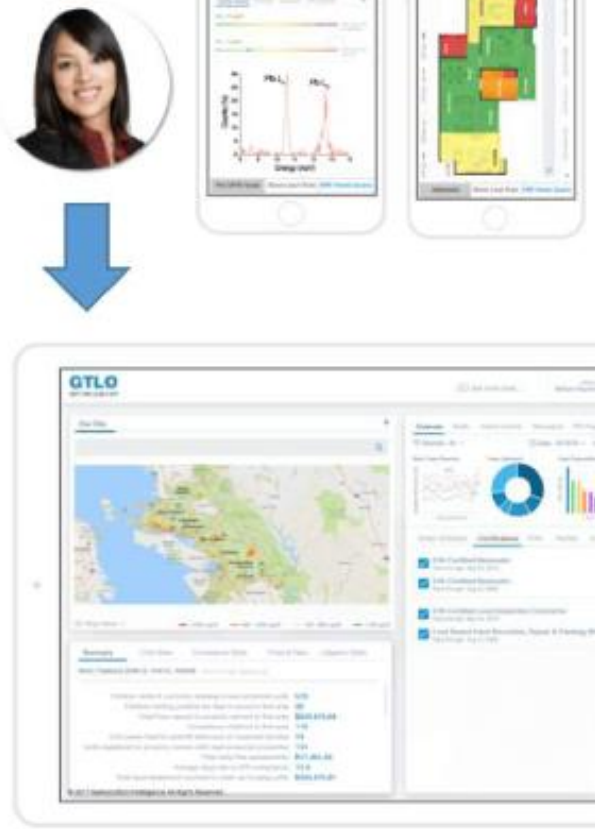


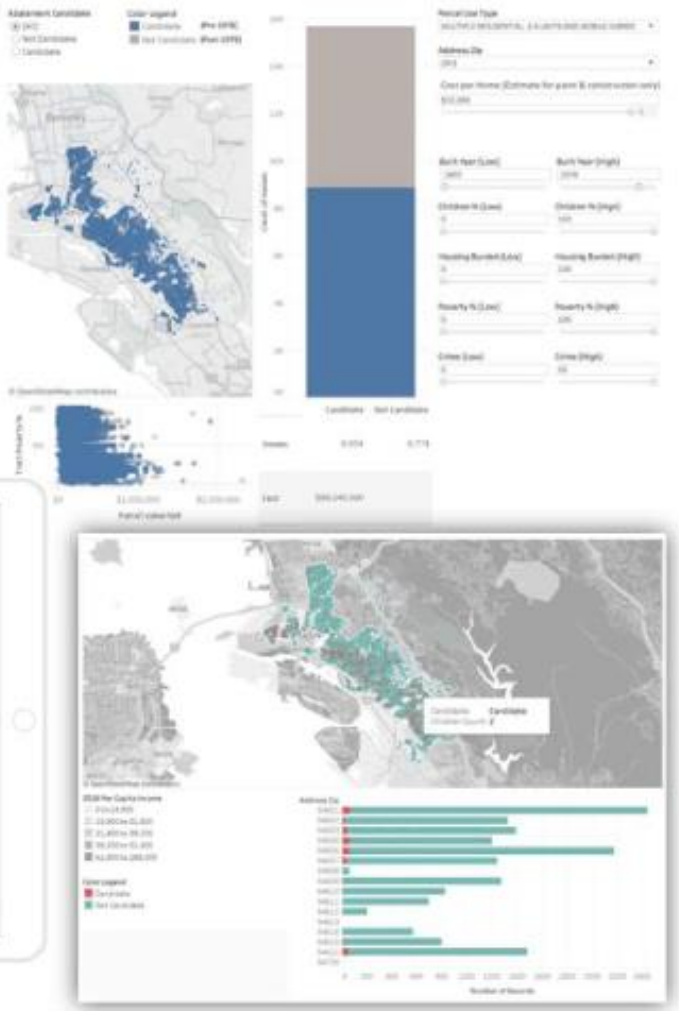
Find risks and money to fund lead abatement

William uses MI to find Maria and others like her to win more cases faster. | MI runs on Blockchain

William is a lead plaintiff attorney who understands thousands of people and cities are at risk for lead poisoning, so he's expanding his law practice by advertising to At Risk Zip Codes and parents of children 6 and under.

He's developing class action law suits to hold large corporations accountable for manufacturing and selling lead paint and medical providers who have not been warning parents or testing their kids for lead poisoning per federal and state regulations.





Find at-risk kids before poison finds them and connect to 911 for emergency response…

Joe uses MI to rescue people who've realized they're in poison rooms. | And to keep himself safe too

Joe is a fire fighter and First Responder who takes action on 911 calls and risks his life saving others.

He uses MI 911 to locate at risk children in lead poisoned homes and to know if the burning building he's running into will poison his team. He can take extra precautions as they arrive on scene to assist with the emergency call.

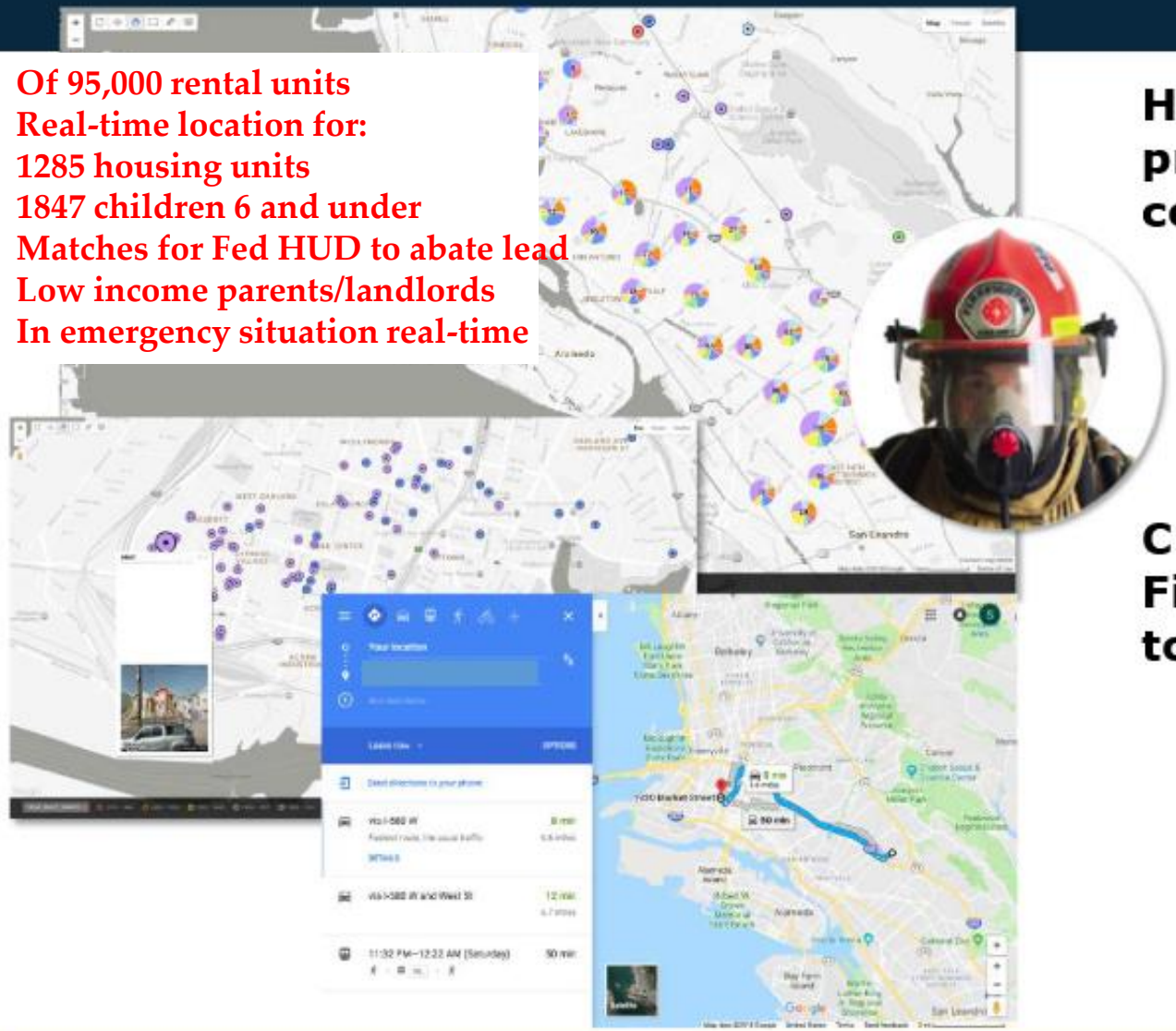
IWCE IoT SAVING LIVES

Conference: May 14, 2018
Santa Clara Convention Center
Santa Clara, CA

CO-LOCATED WITH
Internet of Things World

We offered to help ACHHD meet their HUD funding targets, of 70 units with 70 kids, but we didn't. We found all of them. What do you do when you suddenly have clear, real-time, insight into mass poisoning events? You have to develop new relationships…quickly.

- Of 95,000 rental units
- Real-time location for:
- 1285 housing units
- 1847 children 6 and under
- Matches for Fed HUD to abate lead
- Low income parents/landlords
- In emergency situation real-time



How to build new emergency response protocols that include neighborhood community leaders

- Connect at-risk children and families with Federal HUD funds and non-profits to abate the lead from low income units.
- Work with City of Oakland's 56 Neighborhood Councils to do block-by-block testing of every home and child in the district to promote more testing and large-scale buy in at National Night Out on August 7, 2018 – starting with this one!

Create new life saving capabilities for First Responders and empower people to watch out for themselves too

- Emergency Responders, possibly using FirstNet, can know about life saving lead data, at-risk people, and also protect themselves from exposure to lead hazards while they're doing their critical work.
- Our goal is to enable a national safety and resilience platform that streams real-time data, via IoT, to empower more people to be informed and watch out for themselves while performing better connections to critical services in emergencies.

Thank you!
Coming up next…

Smart City Vision, Strategic Planning, & Digital Transformation Methodology

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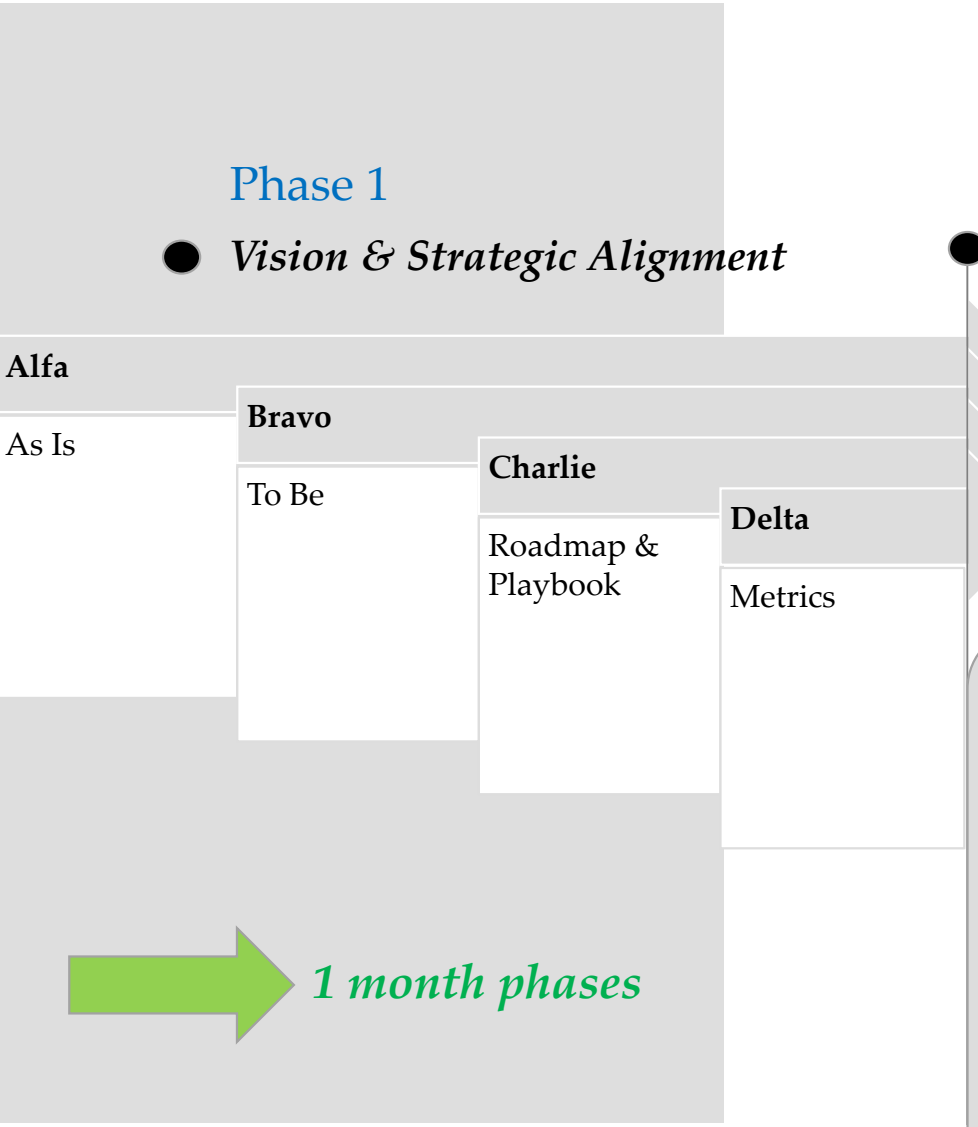

Phase 1

Vision & Strategic Alignment

Phase 2

Program Architecture

- User Experience Architecture
- Business Architecture
- Data Architecture
- Application Architecture
- Infrastructure Architecture

Phase 3

Business Requirements & Project Plans

- Business Requirements
- Project Plans
- Data Privacy Governance
- Solution Designs
- Team Assignments
- Applications & Infrastructure

Phase 4

Program Implementation

- Digital Transformation & Smart City Program Development
- Smart City Project Pipeline Portfolio Mgmt
- Smart City Development & Workforce Dev for new Smart City Jobs

Phase 5

Adoption, Communications & Outreach

- Promote and deliver Smart City programs and services
- Share storylines about the future of Smart City to drive adoption
- Engage constituents to co-design future services

http://www.visionarchitectureinc.com/booking