

# Adaptation Strategies from an Air Quality and Community Health Perspective for the I-880 Corridor and Oakland/Alameda Estuary Area



BAY AREA  
AIR QUALITY  
MANAGEMENT  
DISTRICT



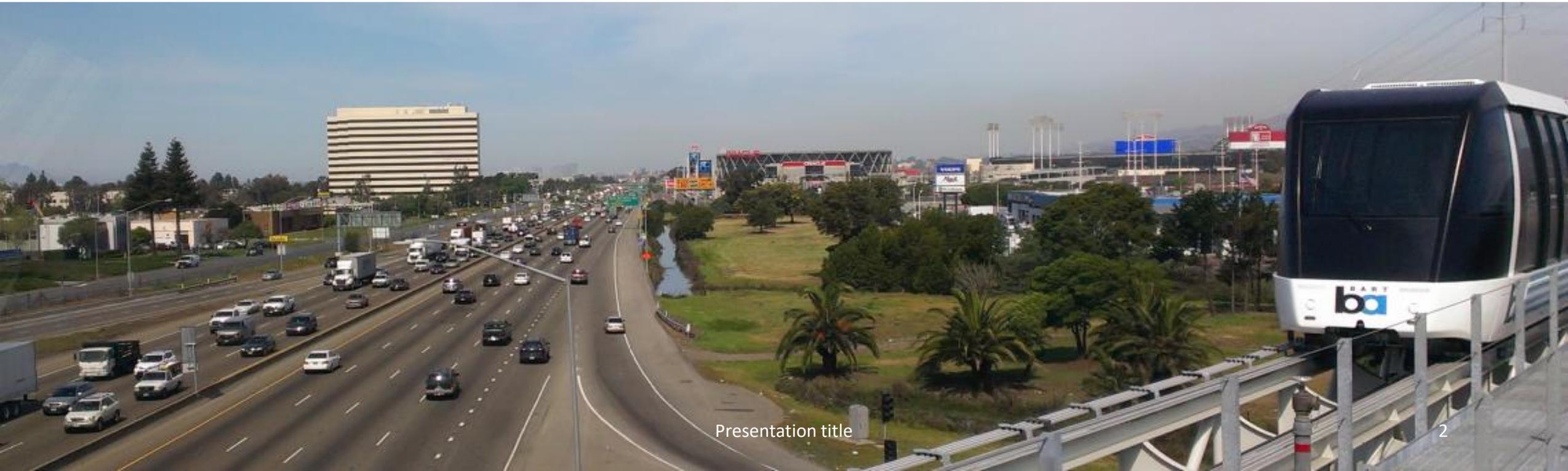
David Ralston, BAAQMD

September 13, 2023

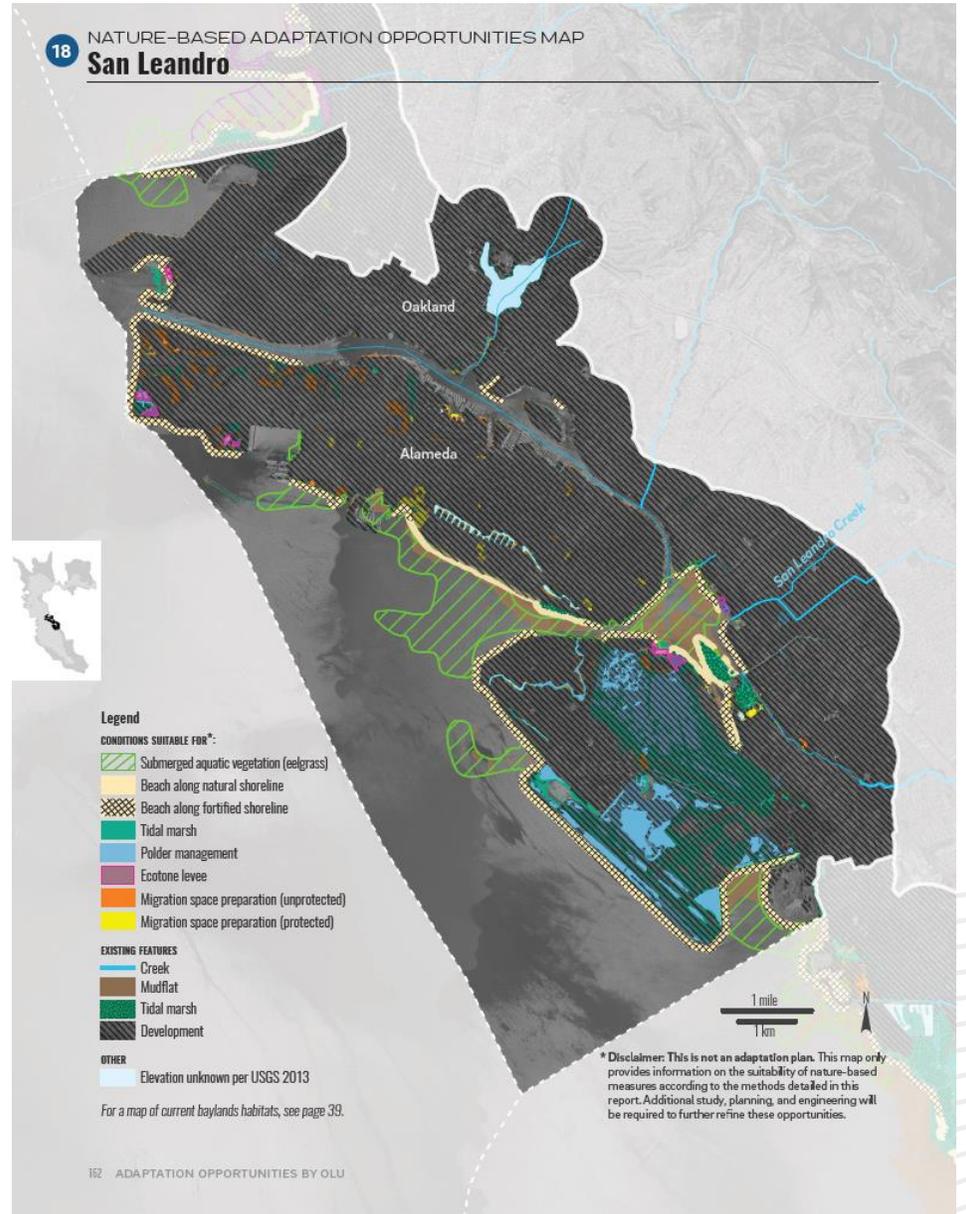
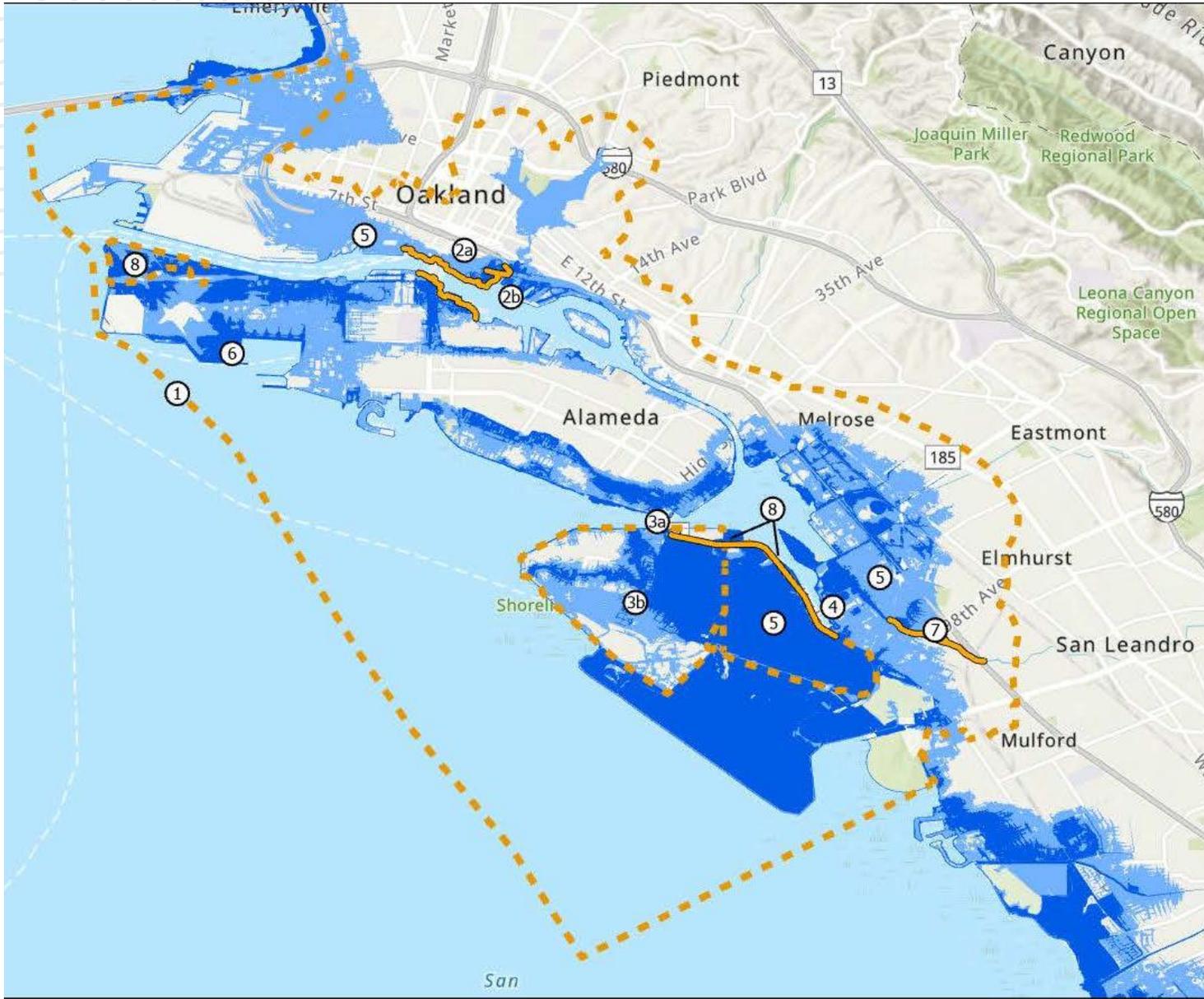


## OUTLINE

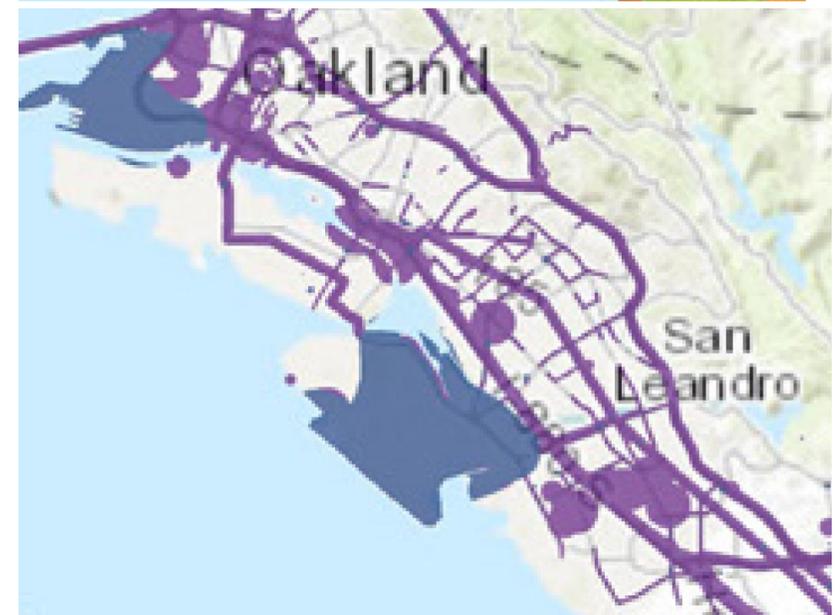
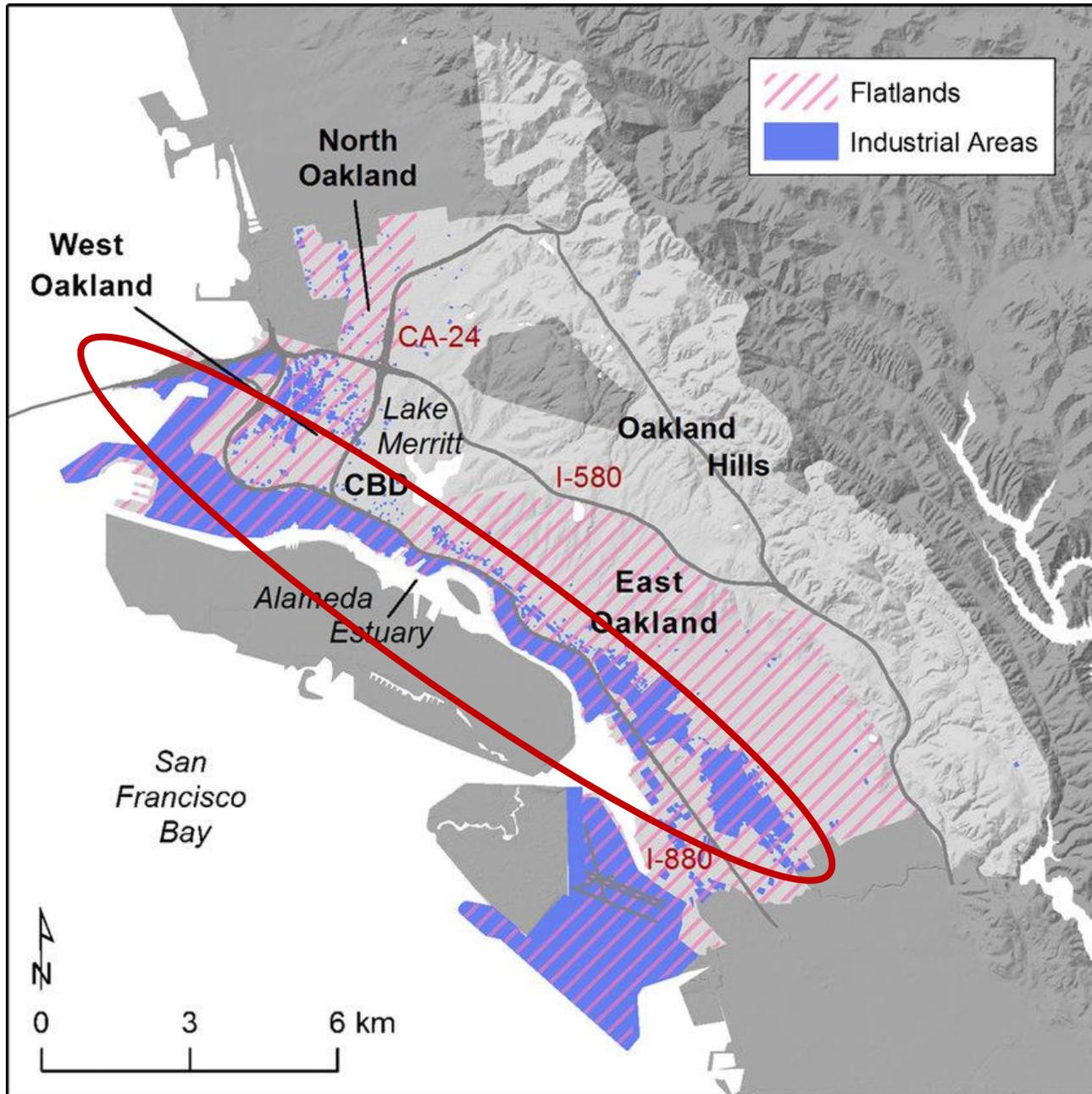
- Overview and Overlap of Catchment Areas
- Existing Air Quality Conditions
- On-Going Planning Efforts
- Co-Beneficial Mitigation
- Future Opportunities



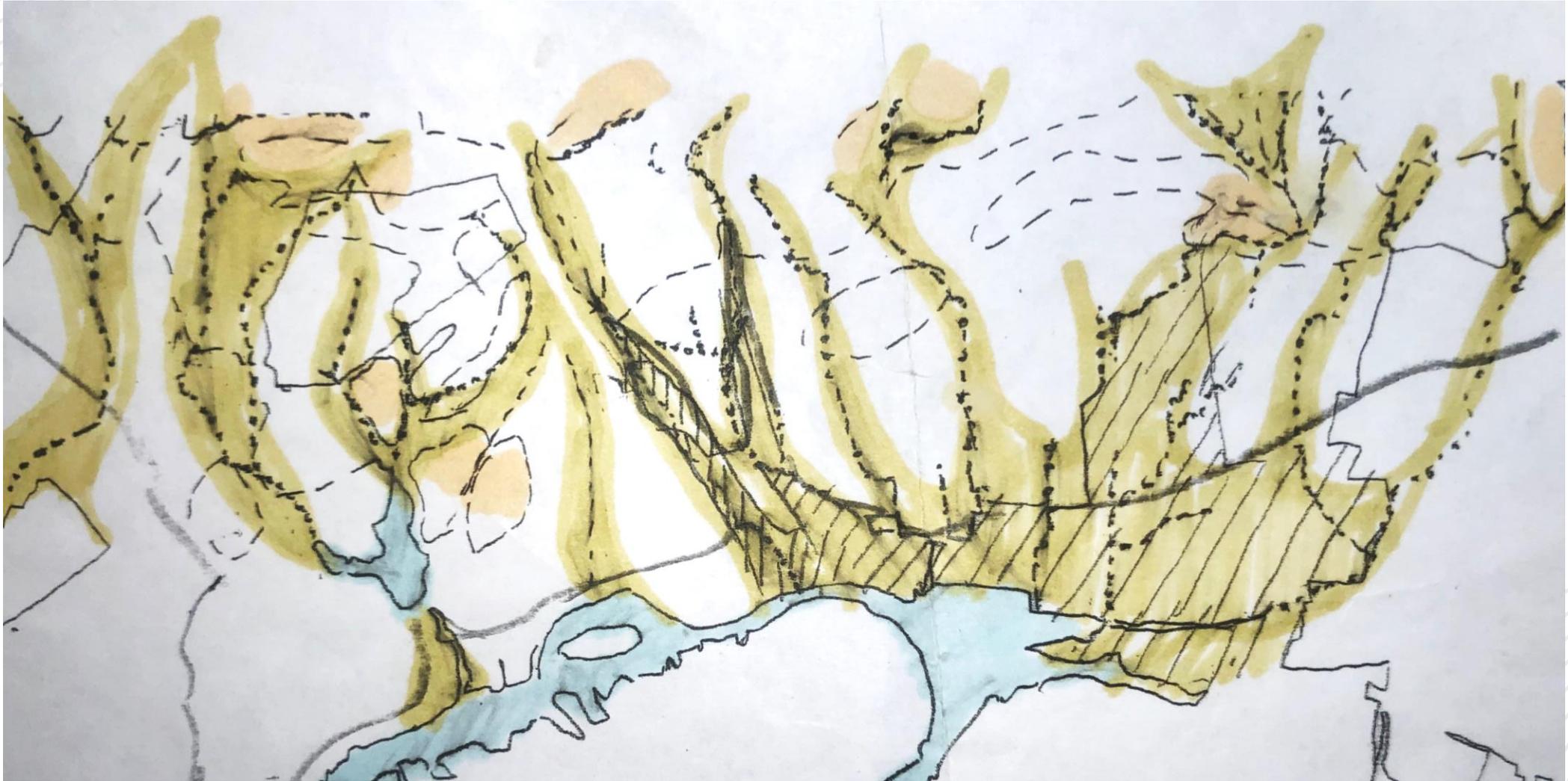
# Oakland-Alameda Estuary – “San Leandro Creek” Sub-Region Area



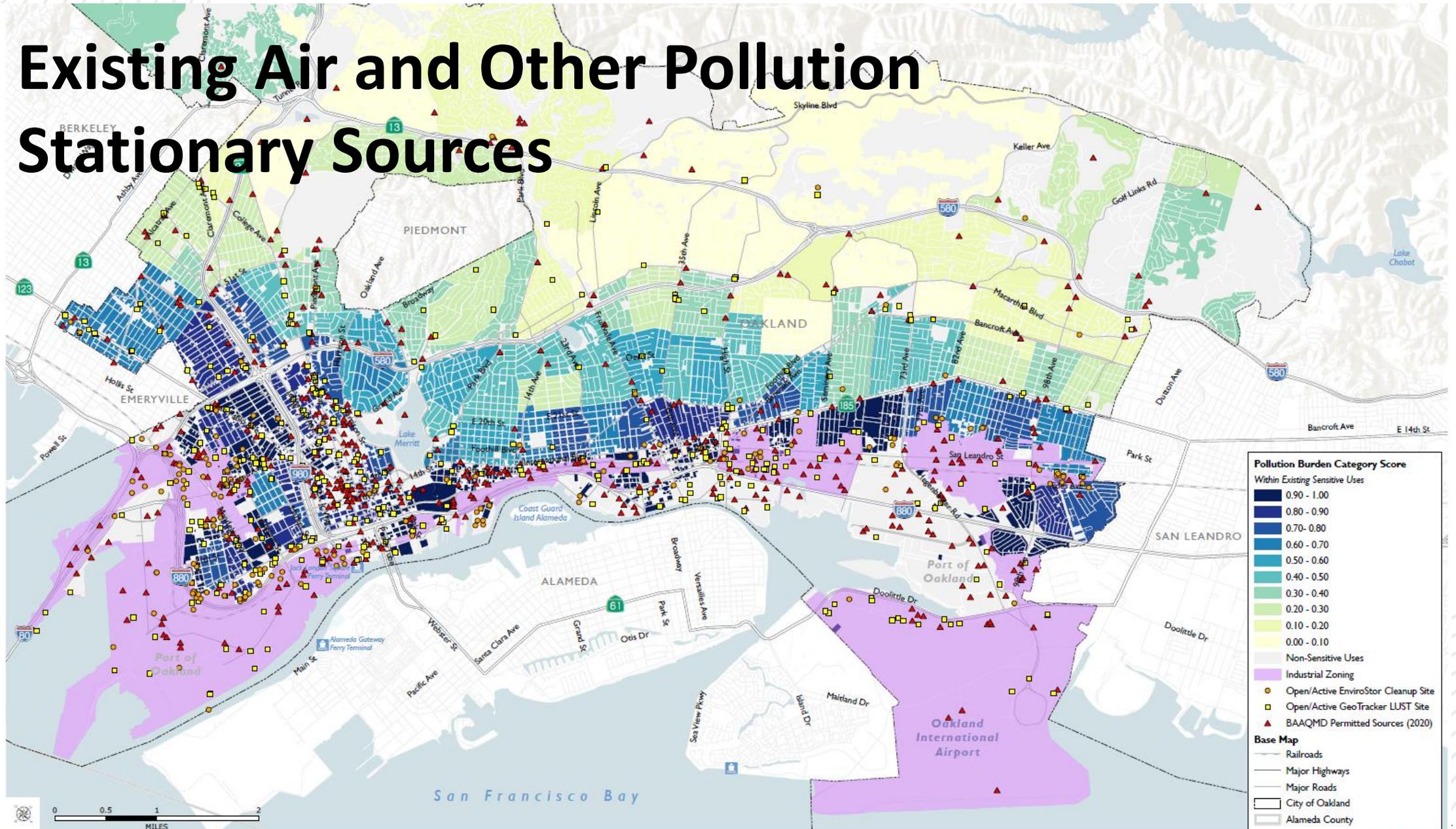
# I-880 Corridor Sub-Region Area through Oakland



# Topographies: Where the Wetlands Meet the Flatlands...



# Existing Air and Other Pollution Stationary Sources

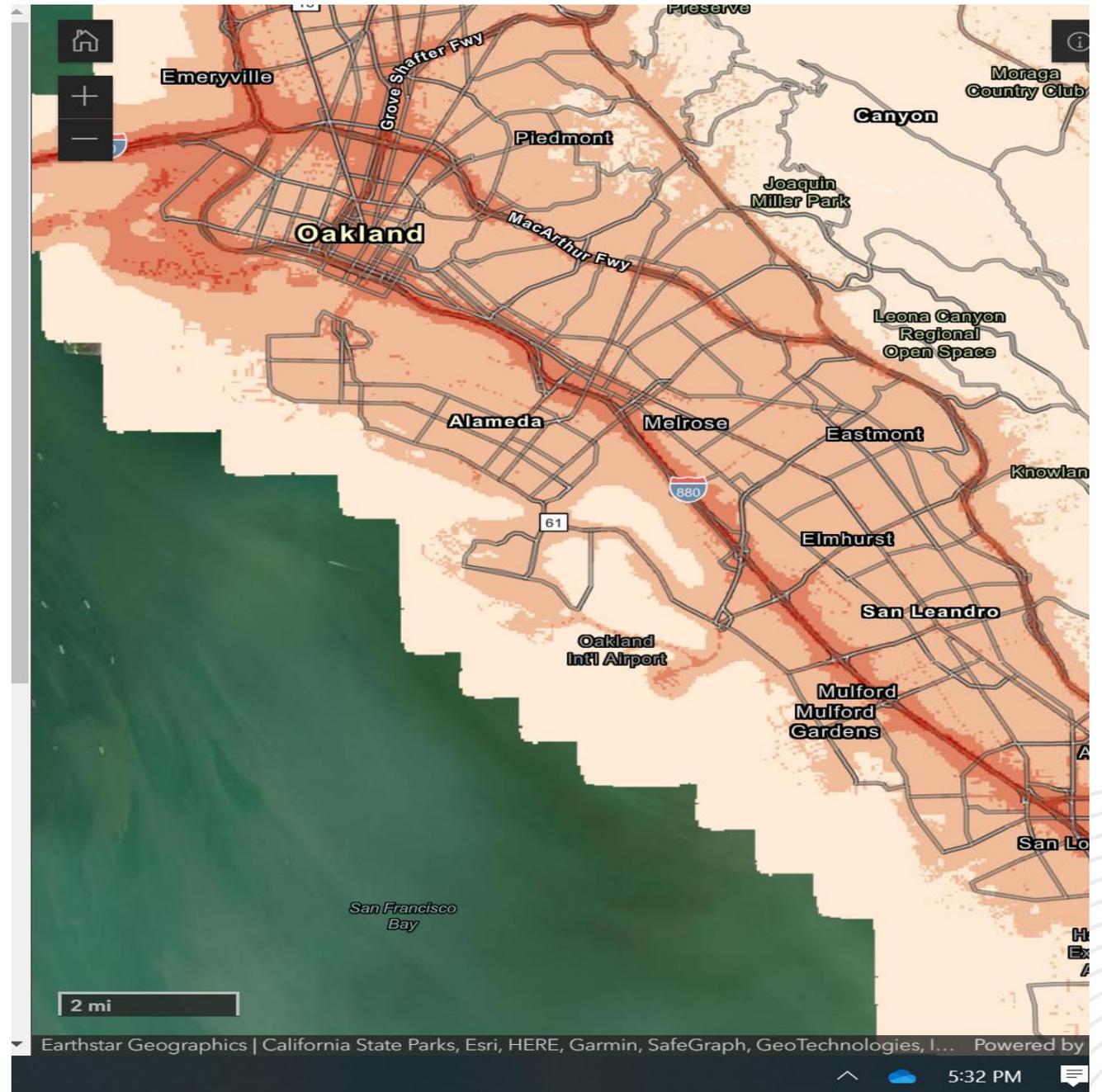


SOURCE: City of Oakland, 2021; ALAMEDA County GIS, 2021; Dyett & Bhatia, 2022.  
 Sensitive uses include existing residential uses, schools/educational facilities, religious/institutional uses, and hospitals.

# Specific Air District Data

Specific air quality existing conditions

<https://mtc.maps.arcgis.com/apps/instant/sidebar/index.html?appid=c5f9b1a40326409a89076bdc0d95e429>



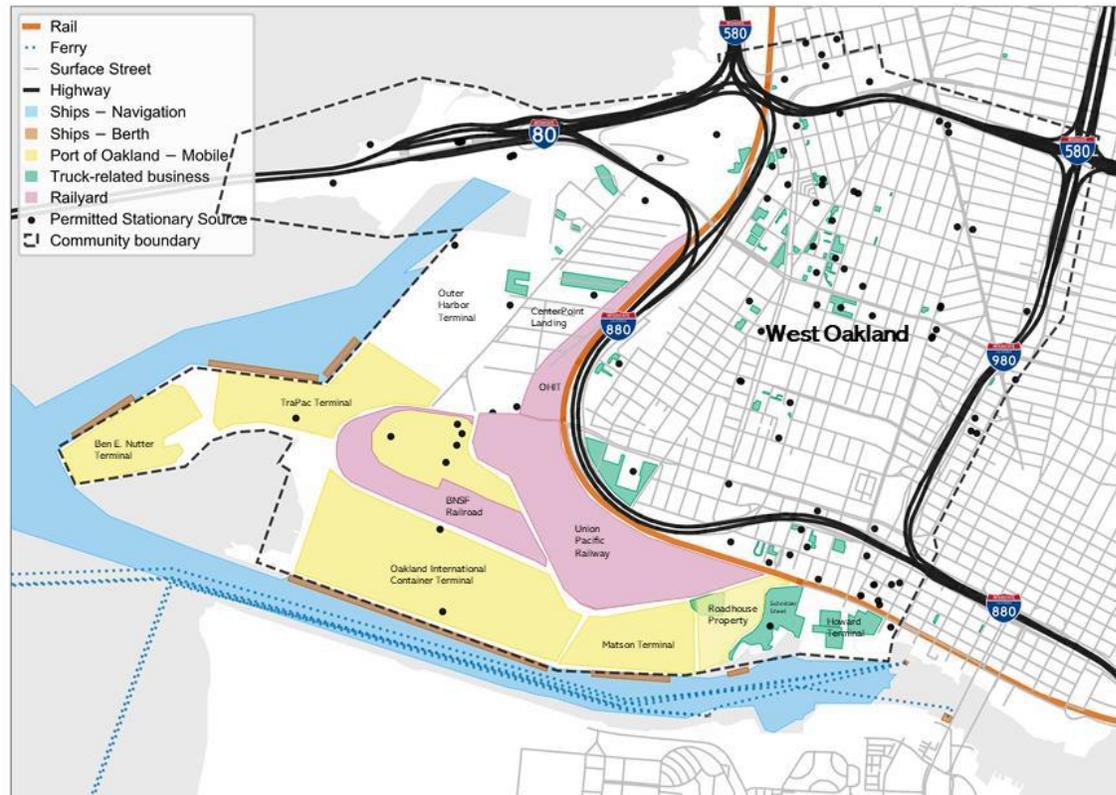
# Planning Efforts



- Over last 5-8 years the Air District has been involved in various specific planning efforts focused on the I-880 corridor catchment area.
- A shared theme in these has been focused on supporting innovative strategies to reduce, control, or mitigate air pollution emissions as well as reduce community and environmental health impacts from exposure.
- There has been tremendous interest expressed by community members in promoting co-beneficial green infrastructure approaches – especially focused on the I-880 and nearby industrial areas as a driver of downwind pollution and as a barrier - for community health, resiliency, sustainability, and equity.

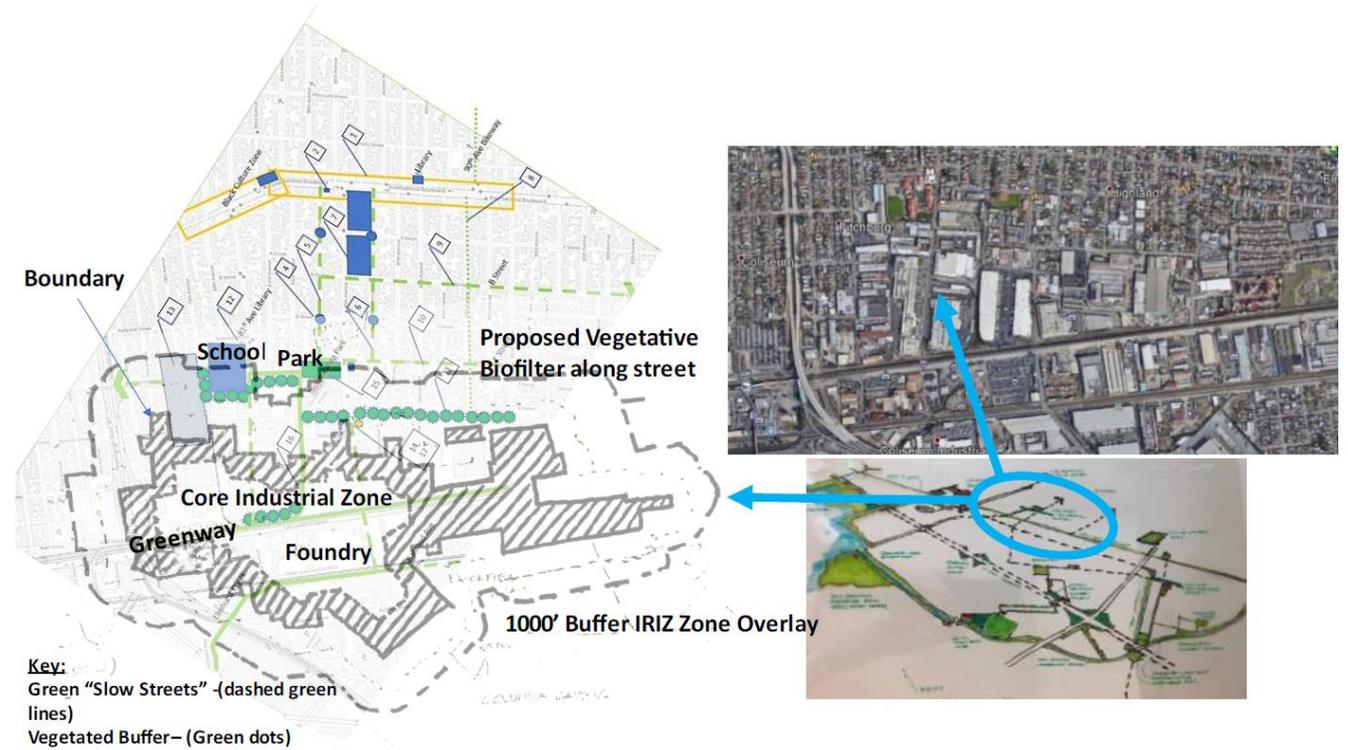
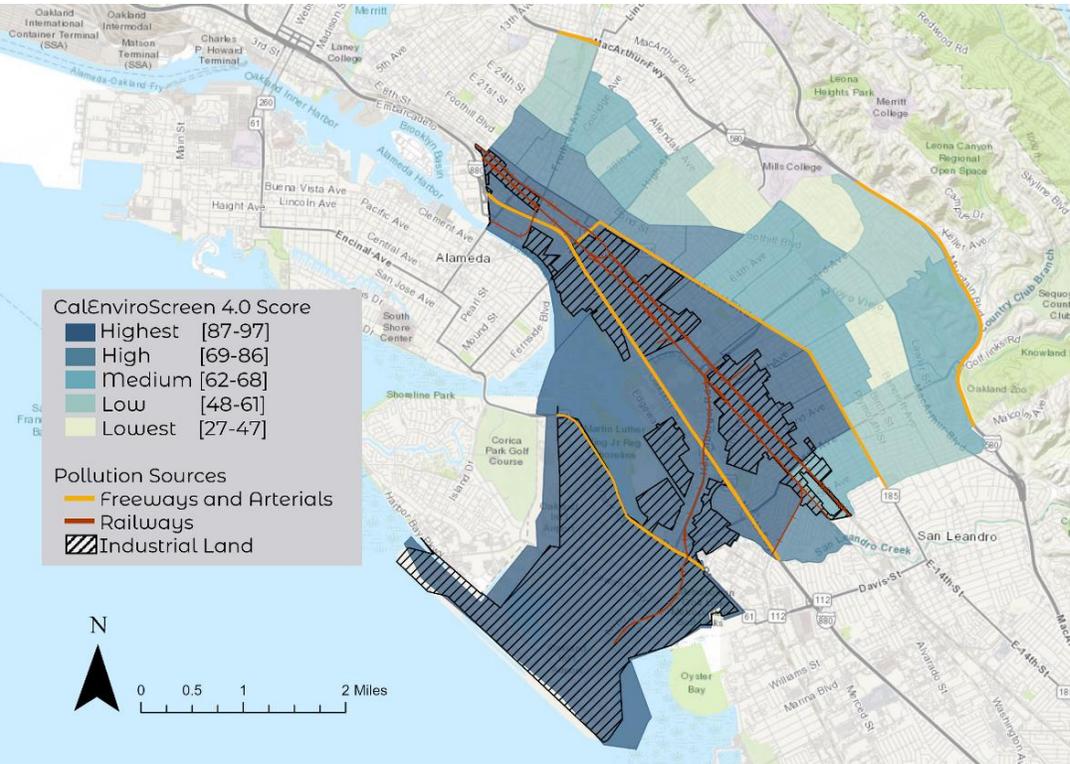


# West Oakland CERP Area



| #  | Strategies  | Authority                                     |
|----|---|---|
|    | to allow for collecting surveys and partnering with the Air District and CARB to allow enforcement access.  |   |
| 8  | The City of Oakland amends existing City Ordinances and Administrative policies to list new truck yards and truck service, repair and fueling businesses as prohibited uses within the area of West Oakland that is inside the freeways (excluding the Port, OAB, and 3rd St. corridor of Jack London Square from Brush St. to Union St.).  | City of Oakland                               |
| 9  | The City of Oakland develops a plan to limit the hours that trucks can operate in the community.  | City of Oakland                               |
| 10 | The City of Oakland creates a comprehensive, area-wide urban canopy and vegetation plan that identifies locations that trees can be added and maintained, such as parks and along Caltrans right-of-ways and develops a plan to protect existing trees that reduce exposure to air pollution emissions in West Oakland. This includes partnering with local nonprofit groups, encouraging trees on private property, and working with the community on tree maintenance and (as needed) removal. The development of the Oakland Urban Forest Master Plan will inform this work. | City of Oakland, Caltrans                     |
| 11 | The City of Oakland works with local groups to train residents to maintain biofilters.  | City of Oakland                               |
| 12 | The Air District and the West Oakland Environmental Indicators Project intends to implement the green infrastructure project currently under development between Interstate I-880 and the Prescott neighborhood in West Oakland by 2021.  | Air District                                  |
| 13 | The City of Oakland conducts a study regarding development fees for environmental mitigations.  | City of Oakland                               |
| 14 | The Air District provides subsidized loans for local small businesses to install energy storage systems (e.g. batteries, fuel cells) to replace stationary sources of pollution (e.g. back-up generators).  | Air District                                  |
| 15 | The City of Oakland continues requiring new developments to provide infrastructure for electrical vehicle charging stations.  | City of Oakland                               |
| 16 | The City of Oakland, in partnership with the Steering Committee, CARB and the Air District, studies the exposure reduction benefit of requiring solid or vegetative barriers to be incorporated into site design between buildings and sources of air pollution (for example, a freeway).   | City of Oakland, CARB, Caltrans, Air District |
| 17 | The City of Oakland adopts policies to lessen air quality impacts of residential and office buildings through the reduction or elimination of natural gas systems.  | City of Oakland                               |

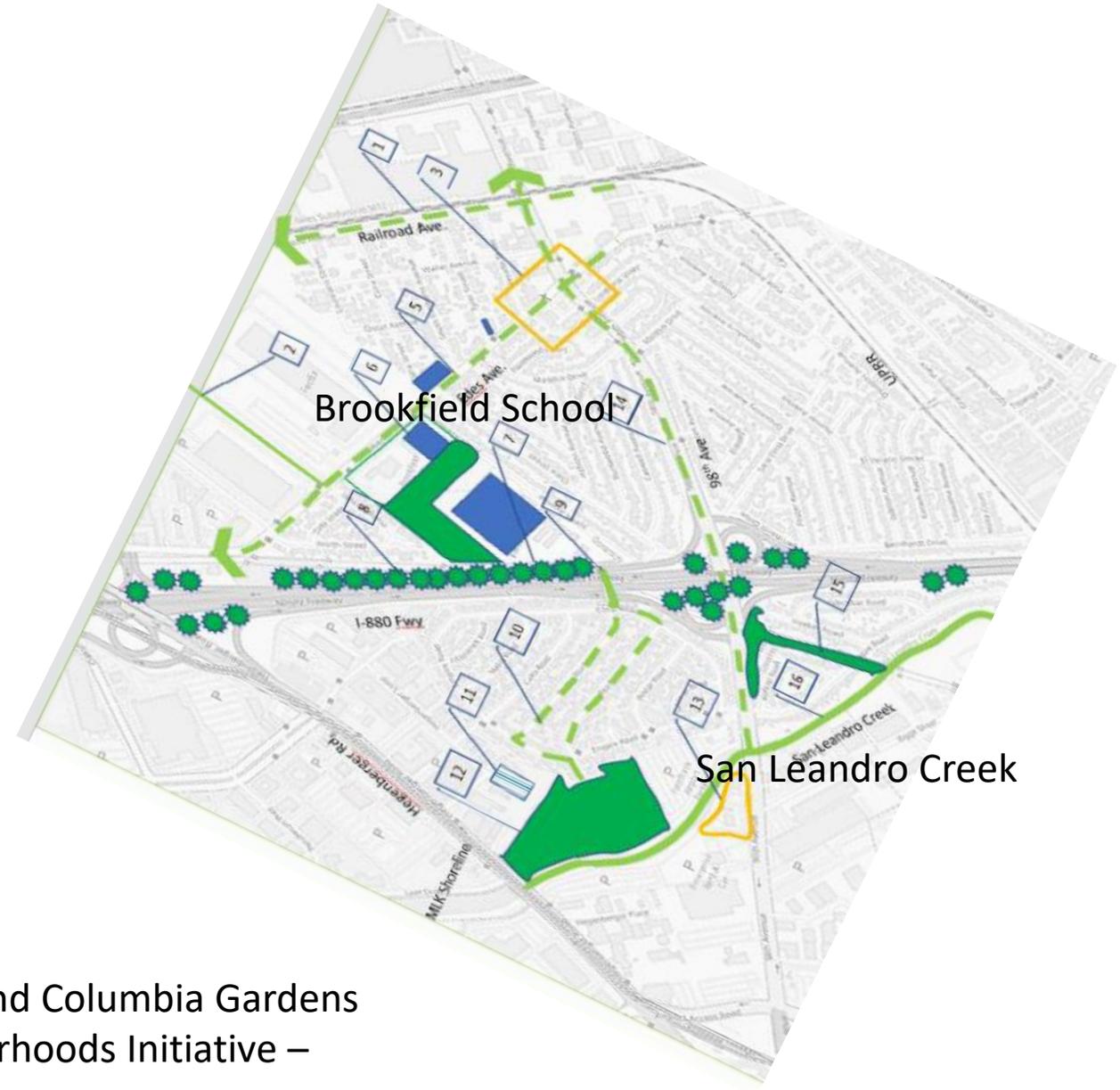
# East Oakland CERP Area



Above: map from the East Oakland Neighborhoods Initiative Plan shows locations for proposed green streets, vegetated buffers along streets, and other green connections in this legacy industrial-residential area.

# Highlighting Two Co-Beneficial Mitigation Efforts

- Freeway Vegetative Buffers
- Neighborhood Creek Greenway Connectors to Shoreline



Community developed plan for the Brookfield and Columbia Gardens Neighborhood – from the East Oakland Neighborhoods Initiative – Transformative Climate community Plan

# I-880 Buffer Proposal



## West Oakland Biofilter Study

included dispersion modeling inputs of point sources of pollution (black carbon, diesel PM, benzene, etc.) for roadway data.

Showed significant PM going through the 7th St. under-freeway on-ramp/bridge area.

Proposed buffer project could provide an estimated storage of 1350 metric tons of CO<sub>2</sub>e, could remove 360 lbs. of PM<sub>2.5</sub>, 1658 lbs. of NO<sub>2</sub>,

This project could also create stormwater cost benefits of \$41,906 by avoiding 4,689,609 gallons of runoff, and the interception of 11,363,564 gallons of rainwater.



## East Oakland-Brookfield School Project

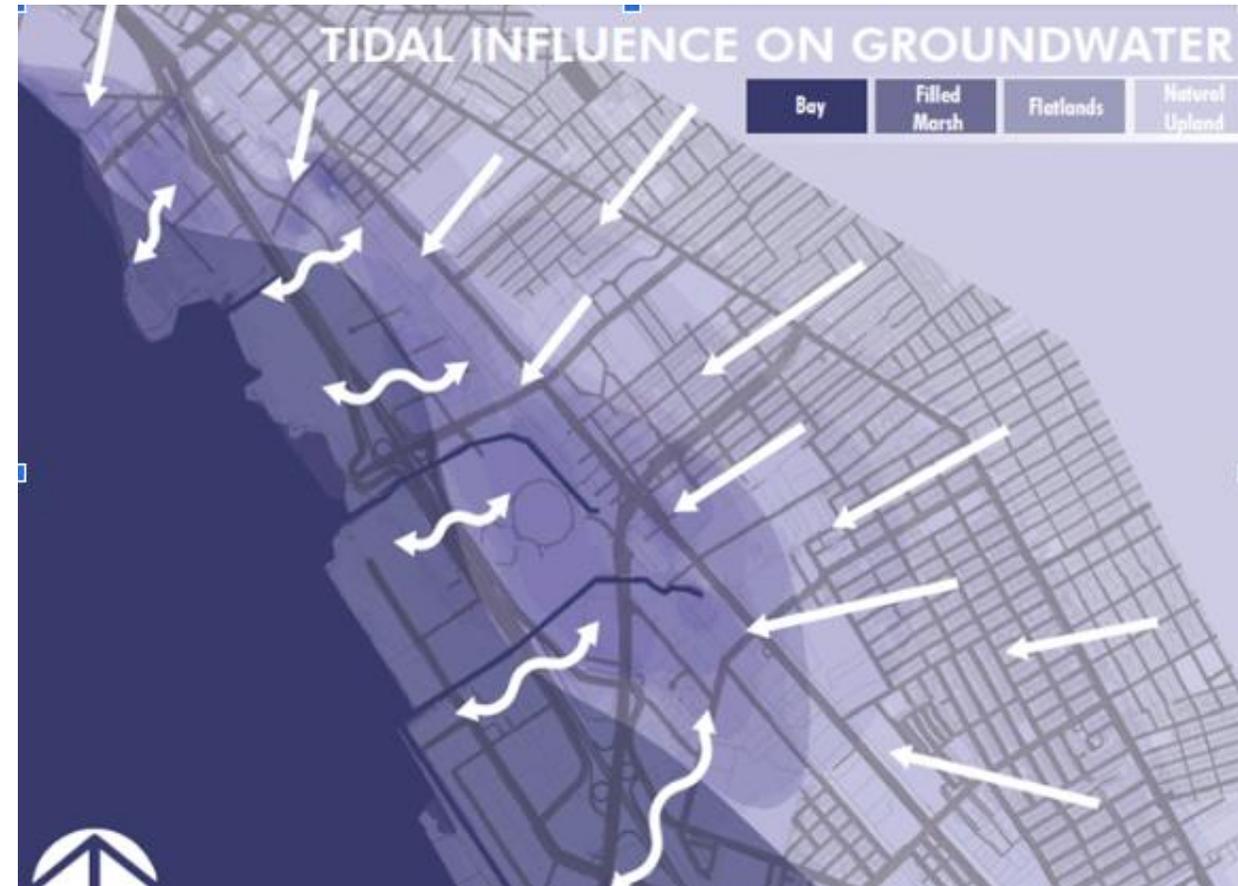
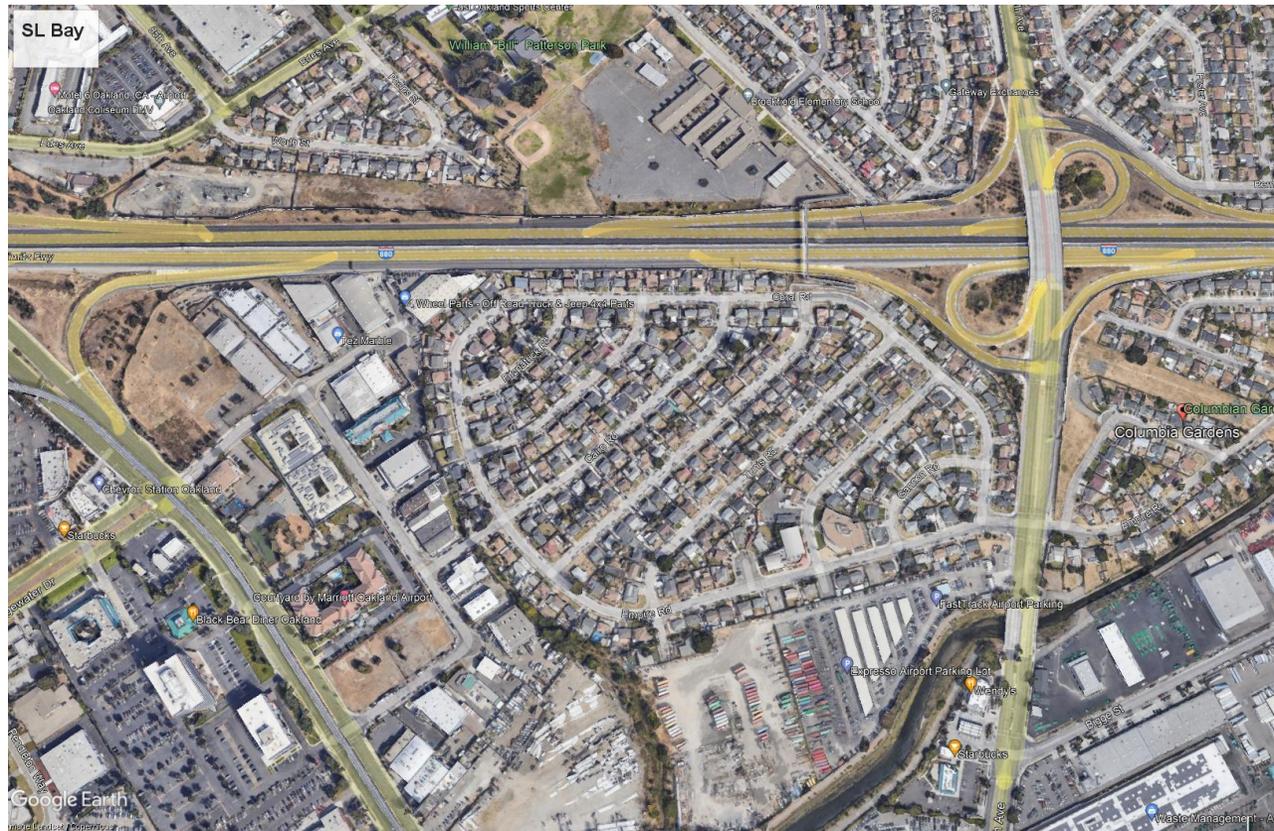
Focused on piloting a 400 lf multi-layered vegetative buffer project at school yard adjacent to freeway.

Starting in 2017 multiple community planting days were held to create a 90' wide green zone on former asphalt playground.

200 trees, bamboo, shrubs have been installed creating a vibrant eco-habitat and mitigating stormwater pooling.

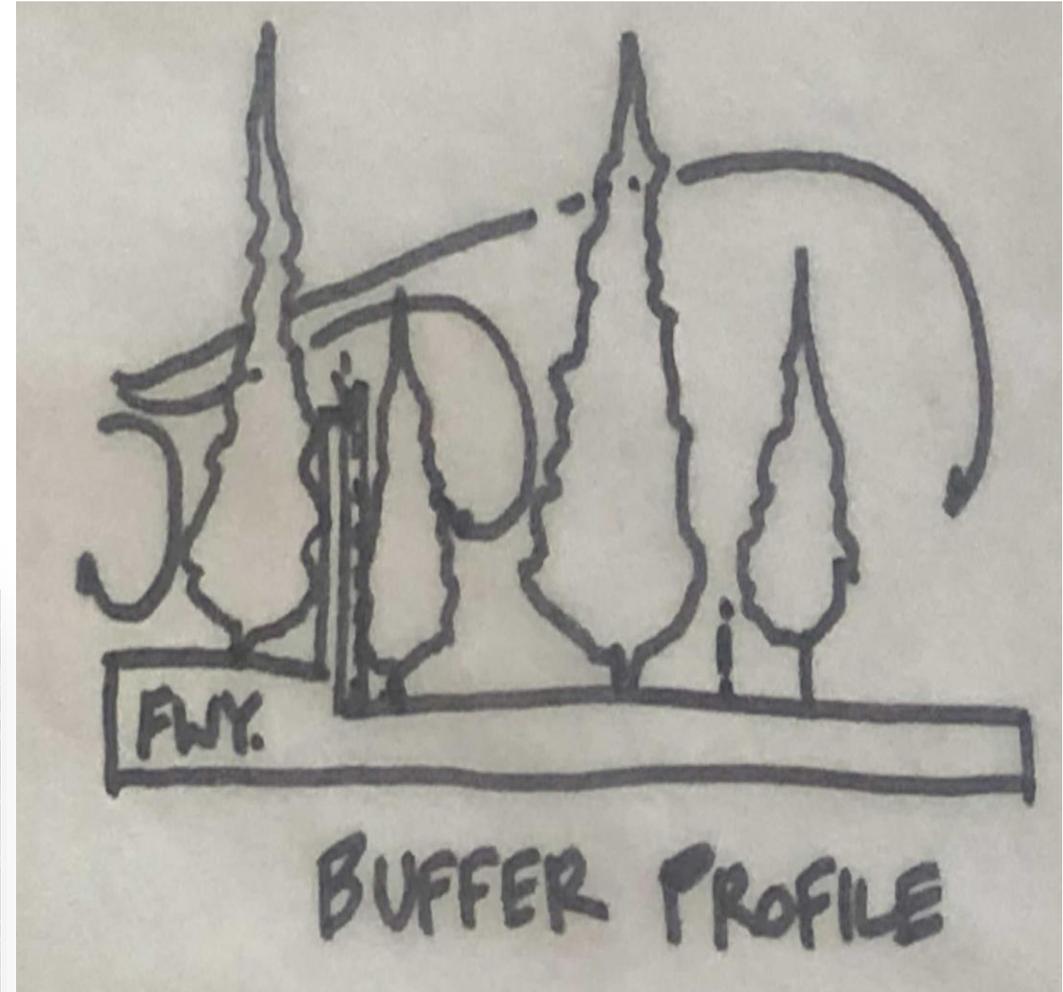
USEPA conducted baseline measurements

# Brookfield school/ groundwater and stormwater management



The groundwater mapping work which was furthered through the RBD process (with ABC team member Kris May) has been published in the journal *Water*, "[A Rapid Assessment Method to Identify Potential Groundwater Flooding Hotspots as Sea Levels Rise in Coastal Cities.](#)"

# Vegetative Buffer as Adaptive Green & Restorative Infrastructure



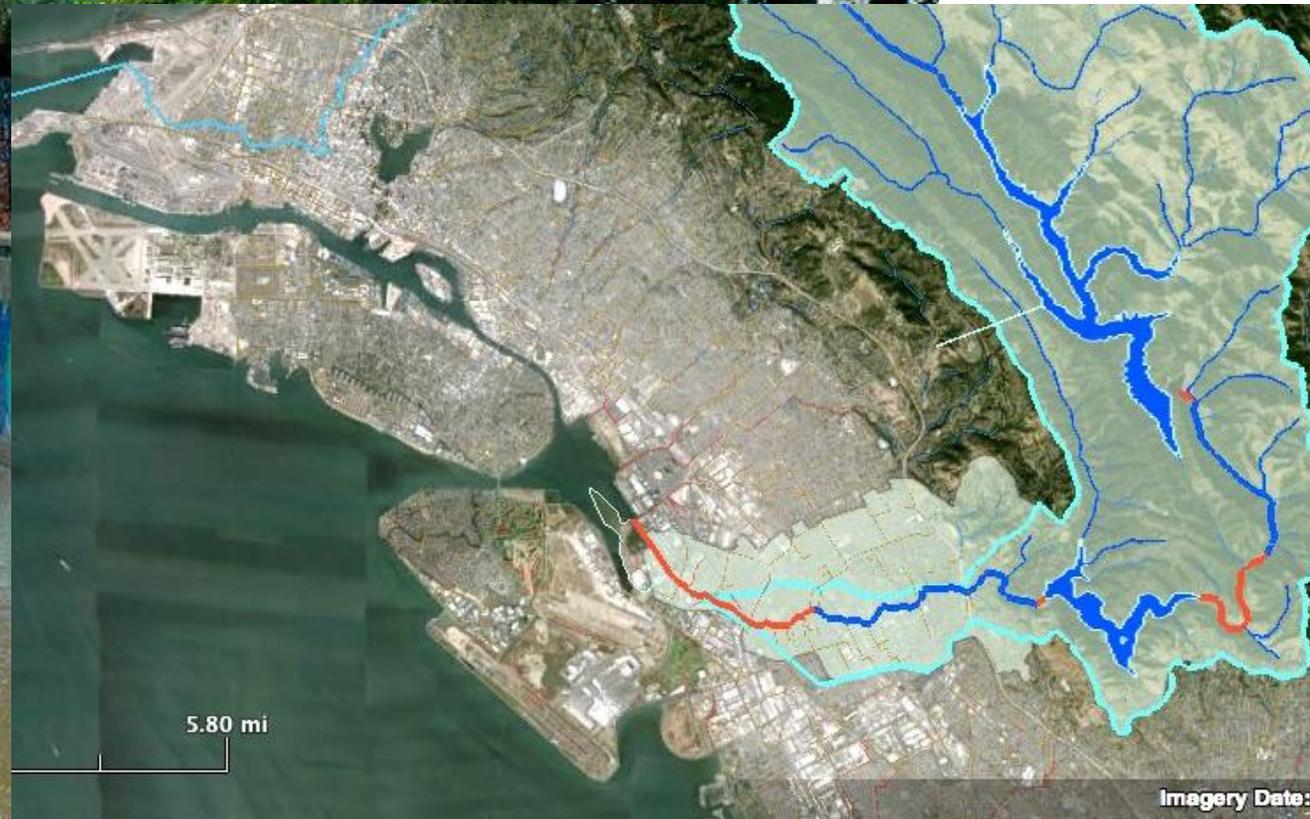
Design vegetative buffer profile to capture air pollution from freeway

# Five-Year Growth of Buffer and Green Living Lab Along Freeway



# SAN LEANDRO/LISJAN CREEK GREENWAY

To most a path, to us a sanctuary.

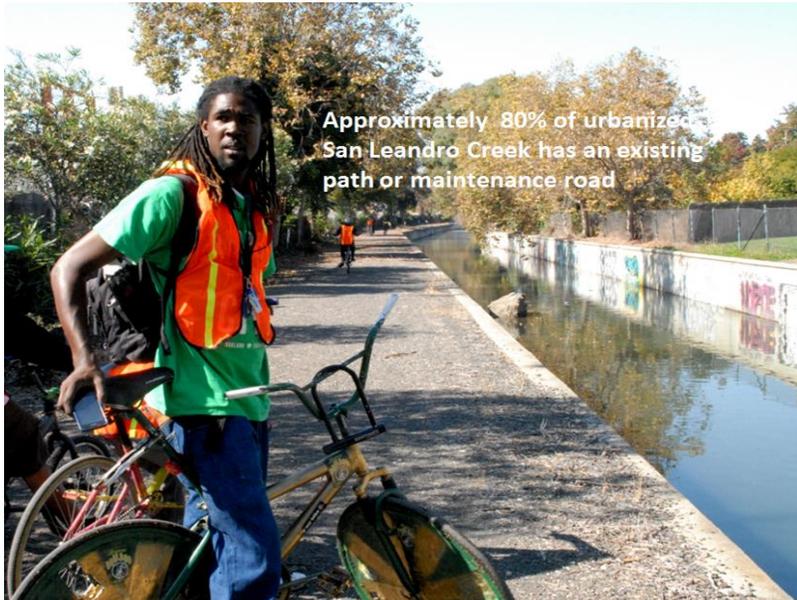


se 1 Trail

Just to go into creeks helps shape a person



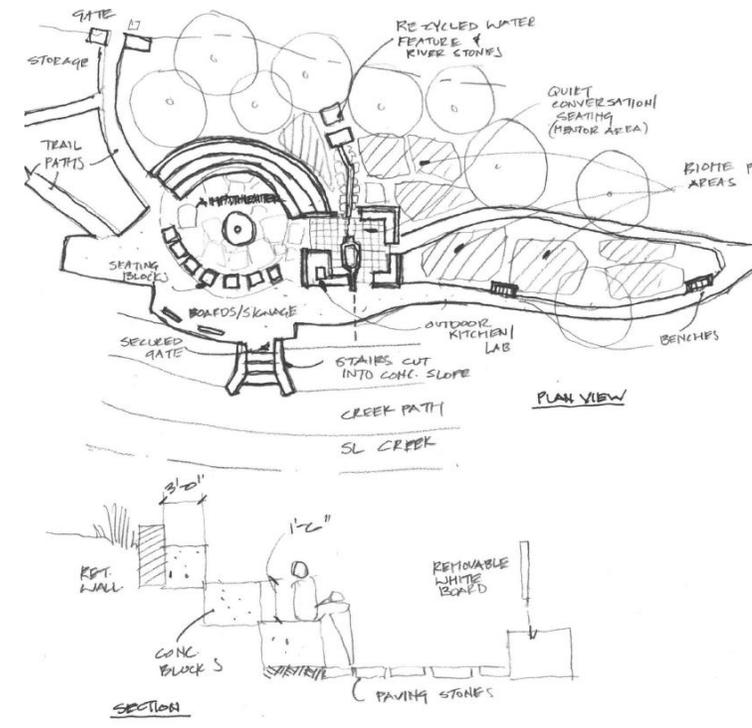
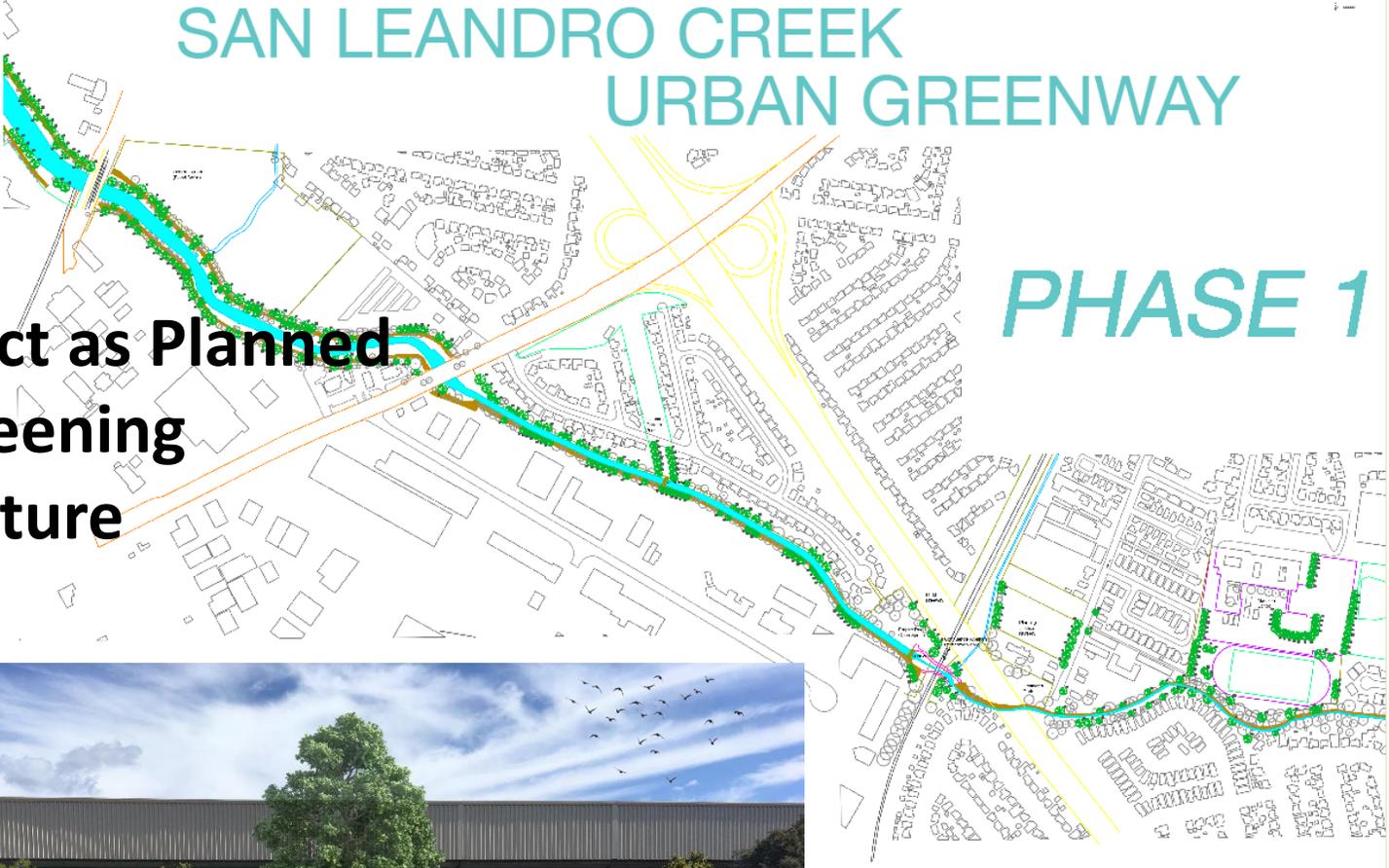
# Re-discovering the San Leandro (Lisjan) Creek is Public



# SAN LEANDRO CREEK URBAN GREENWAY

## The Project as Planned Urban Greening Infrastructure

## PHASE 1



From This....



105<sup>th</sup> Avenue from the creek

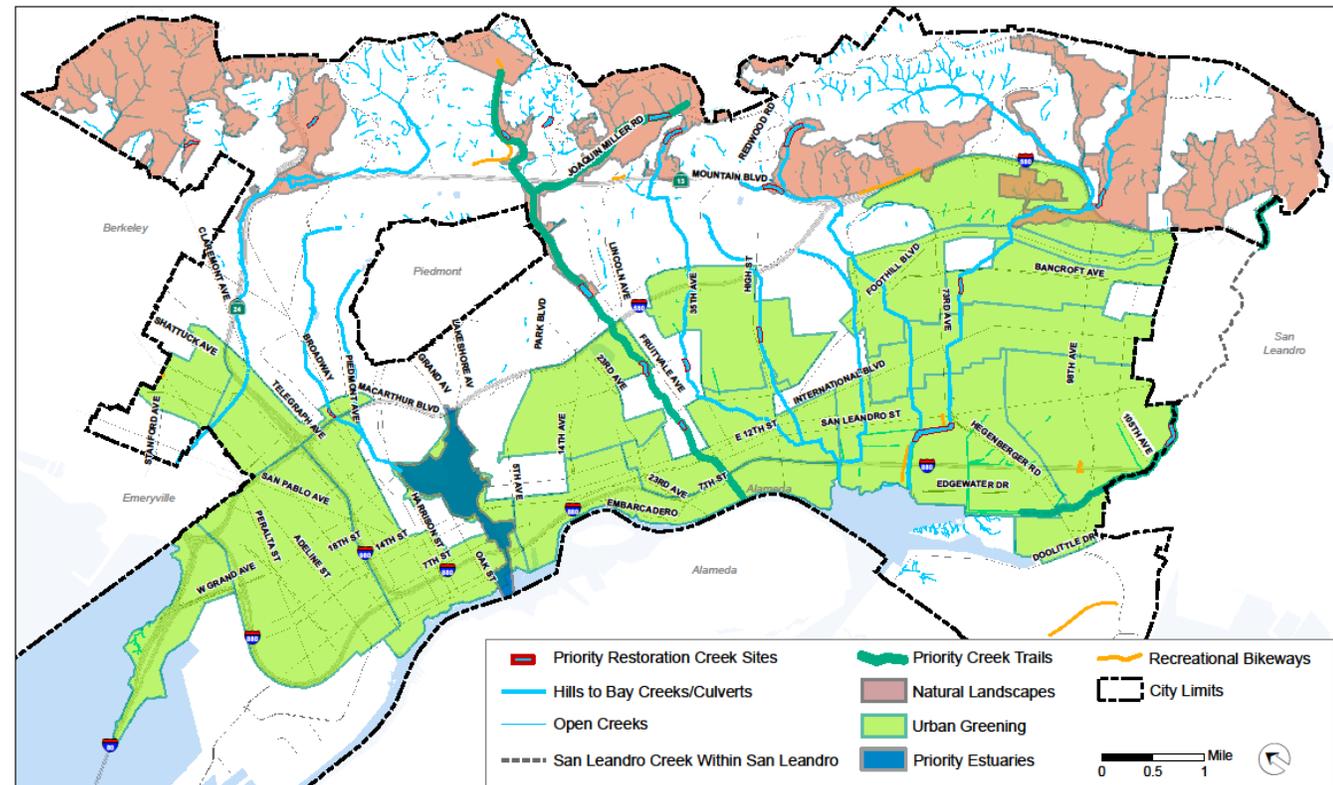
To This...



# Future Opportunities

## Opportunities for co-beneficial projects and cross jurisdictional approaches:

- Implement flood plain zoning overlays;
- Support frontline neighborhoods for equitable urban greening via PCA and PPA;
- Local green job and stewardship programs;
- Lead with innovative co-beneficial adaptation as part of transformation of big development sites (e.g., Coliseum Area, North Shore of Bay Farm Island, Airport, etc.).

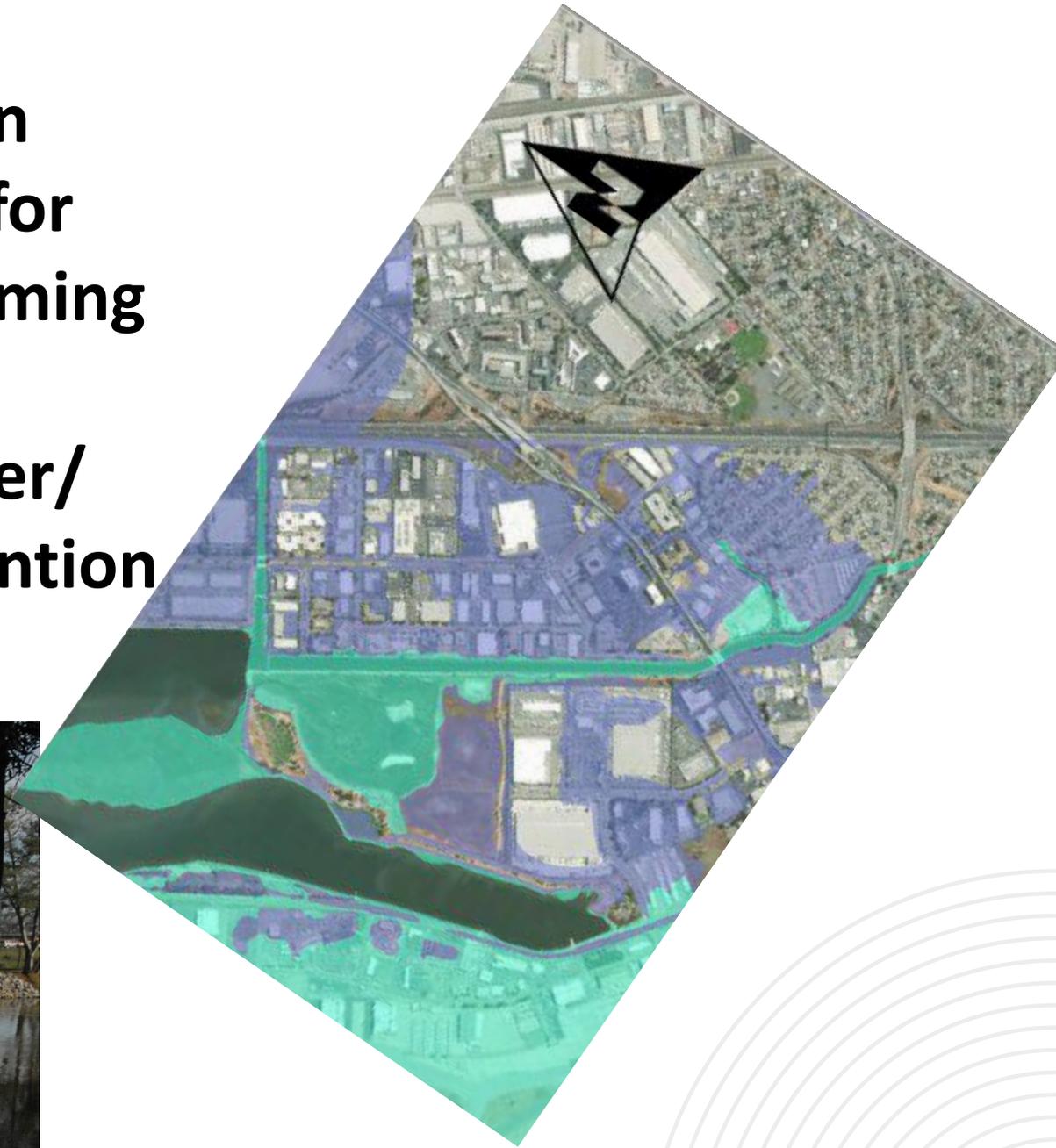


All PCA Designations - Recommendation by ABAG

Planning and Building Department  
July 13, 2015



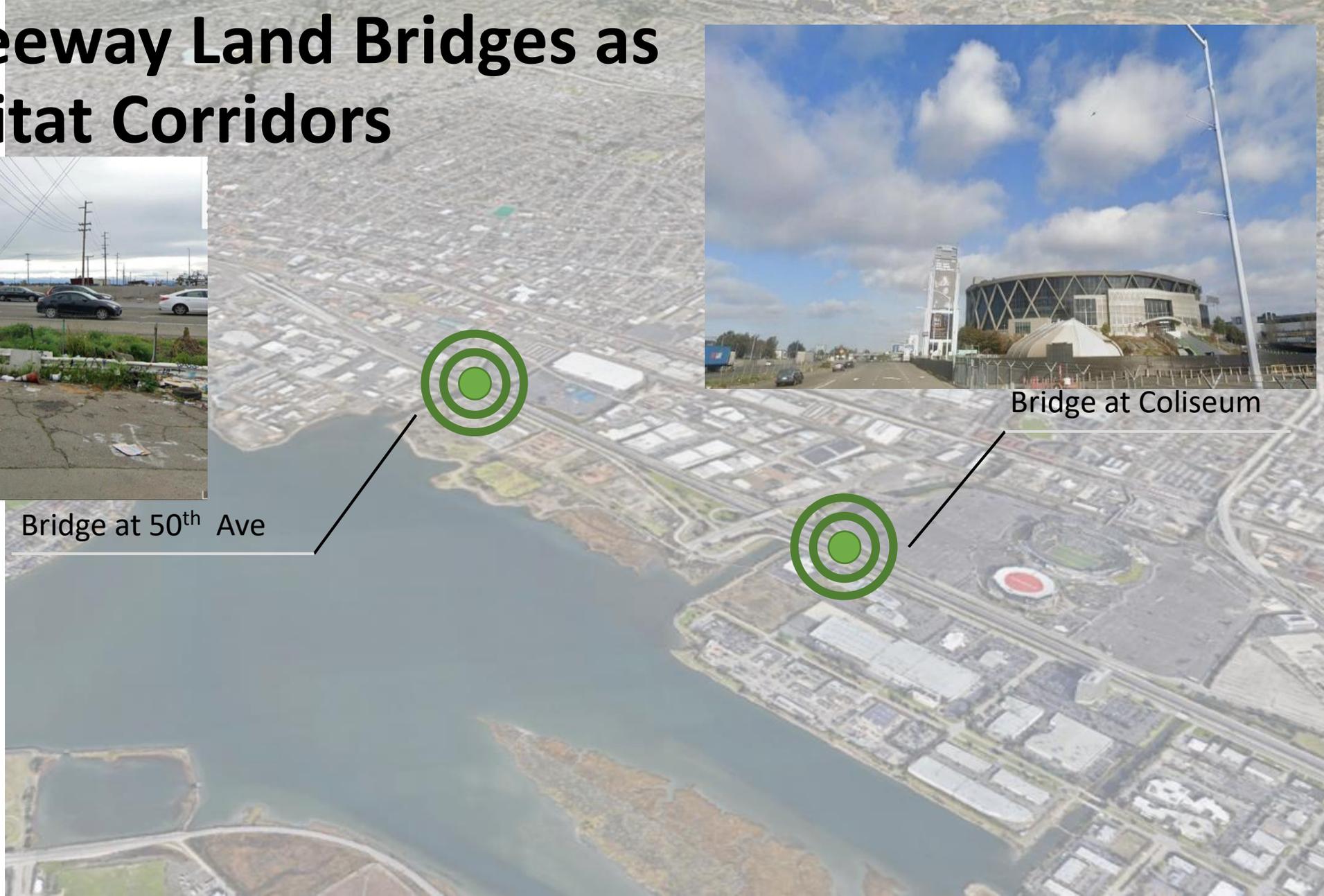
# Flood Plain Land Use for Urban Farming and Stormwater/ Tidal Retention



Old Ratto Farm – Hegenberger Farm Site along San Leandro Creek



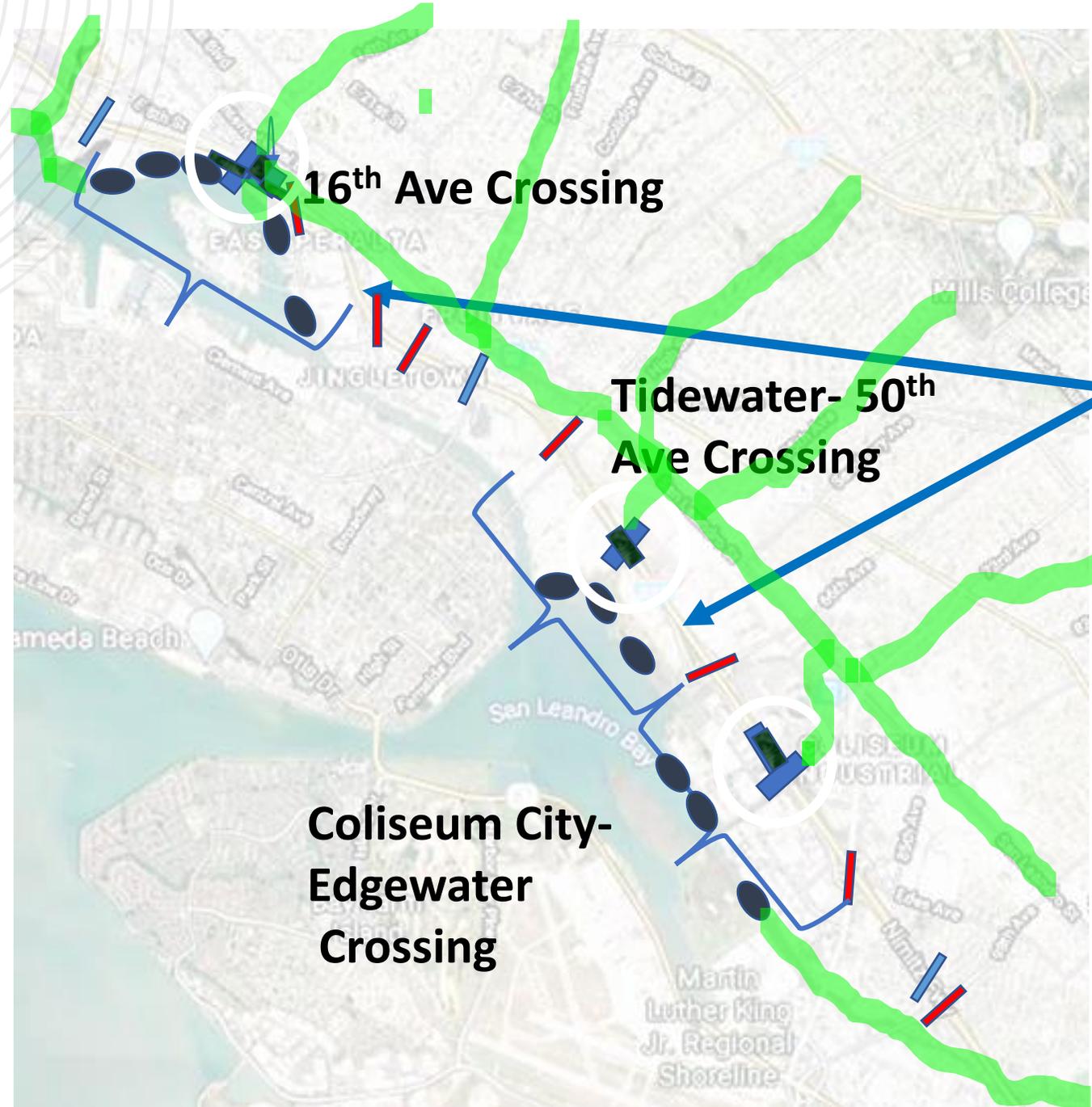
# Retrofit the Grey with the Green: Establish Freeway Land Bridges as Human Habitat Corridors



Bridge at Coliseum

Bridge at 50<sup>th</sup> Ave

# Freeway Crossing Access and Needs



## I-880 Freeway

 Proposed Green Freeway Crossing Lids

 Key waterfront/Bay Trail resource destinations

 Ex. Crossings adequate in safety for ped/bikes (w/ some upgrades)

 Ex. Crossings severely inadequate to unviable for safe ped/bike access

 Gap of safe and walkable access to waterfront Destinations, ~1mi.

## Proposed Oakland Greenway Network Paths



An eco-corridor into Beijing's Olympic Forest Park. Courtesy of [Landscape Performance Series](#).



**Future blue-green infrastructure**





# Looking Forward To Continued Confluence of Opportunities

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Special thanks to all our community partners: Brower-Dellums Institute for Sustainable Policy Studies/Action; East Oakland Collective, Higher Ground, Urban ReLeaf, 100k Trees for Humanity, Planting Justice, and Sogorea Te land Trust



# References

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- Ralston, David C. (2016): “Climate Action Planning and Urban Greenways: Weaving Together Sustainability, Health and Resilience” in *Greenways and Landscapes of Change* – Proceedings of the 5<sup>th</sup> Fabos Greenways Conference, Budapest.
- Ralston, D. Retrofitting the City: Interweaving Urban Nature for Transformative Adaptation. *The Nature of Cities* (online journal). 26, April, 2017.
- Air District Resources:  
<https://www.baaqmd.gov/plans-and-climate/planning-for-environmental-justice-sb-1000/air-pollution-policy-initiatives>