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Walk This Way!

An Underpass Improvement Toolkit



City of
Oakland

Department of
Transportation

PGAdesign
LANDSCAPE
ARCHITECTS

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SECTION 1

Toolkit Introduction

TOOLKIT GOALS

The Oakland Department of Transportation's *Walk This Way Underpass Improvement Toolkit* provides design strategies to make Oakland's underpasses part of safe, walkable, vibrant neighborhoods.

This toolkit is a resource to enable community members, private developers, and agencies to transform the City's underpasses into inviting, safe, and iconic passageways.

Often, underpasses hinder pedestrian circulation and create negative sensory impacts, such as loud noise, poor air quality, and inadequate lighting. The strategies outlined in this document can help mitigate these effects.

These strategies aim to:

- Improve **pedestrian safety**;
- Enhance **pedestrian connections** within and between adjacent neighborhoods, schools, local businesses, open space, cultural institutions, and other nearby destinations;
- Reflect and reinforce **neighborhood identities**; and
- Provide opportunities for walking, cycling, and other **healthy forms of recreation**.

While many factors influence a pedestrian's sense of safety, this toolkit centers design strategies for the built environment. In addition to suggesting widely applicable design approaches, the toolkit also presents concept designs at four Oakland underpasses to show how they can be implemented. Similar applications of these strategies can be realized at other underpasses throughout the City of Oakland. In these pages you will find:

- A **method for analyzing** the pedestrian experience at an underpass;
- **Process diagrams** to guide stakeholders as they obtain permits from Caltrans and consider the City of Oakland's public art policies;
- **Strategies to improve** underpass pedestrian safety and lessen negative sensory impacts using eight design tools: lighting, signage, furnishings, fencing, surface treatments, public art, plantings, architecture & engineering, and airspace.

TOOLKIT AUDIENCE

Today, many different people activate, maintain, and regulate underpasses. Residents, visitors, commuters, and stewards of the public good manage, walk, roll, bike, drive, park, and live in these spaces.

This toolkit is intended to invite a wide variety of people to participate in improving pedestrian safety in underpasses: public agencies, policy makers, developers, business-focused organizations, and community-based organizations. The toolkit's wide-ranging audience means it can be used by those with extensive experience working with or within public agencies, as well as those newer to the process who are invested in improving the safety of Oakland's underpasses.

HOW TO USE THIS TOOLKIT

This toolkit is envisioned to guide the readers to transform neighborhoods and increase pedestrian safety at underpasses. With that in mind, we invite users of this toolkit to consider the following:

- **Identify the challenge.** Start with a clear statement of the underpass issue. For example: *Due to high traffic and low visibility, pedestrians do not feel safe walking to the store on the other side of the highway.* Clearly articulating the issue can help determine solutions: why pedestrians do not feel safe and how a safe pedestrian environment can be developed.
- **Understand that working on streets, within the public right-of-way, is complex.** Many people and agencies participate in the regulation, management, and use of underpasses. Change can involve a significant investment in time, money, and relationships. Because funding is limited, developing your project's vision in the context of other city and public needs can increase its recognition as a high-priority investment. Changing a street can take a long time; setting both short-term and long-term goals can be an effective way to make incremental change.
- **Learn about your underpass.** Understanding your underpass can empower you to make informed choices as you work. Be open as you learn. What are the destinations for pedestrians crossing underpasses? Are there any good qualities about the space? Who does it serve well? Who does it serve poorly? Why was it designed the way it is? How does it function?
- **Be open-minded when exploring pedestrian safety solutions.** Some underpass transformations may require extensive physical changes, and others might simply involve signage, lighting, or improved maintenance.

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HOW TO USE THIS TOOLKIT

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- **Build a team.** Neighborhood transformations usually emerge from strong partnerships and relationships. Decision-makers can be important allies. Find support within your community: remind people underpasses are not just for moving cars under the freeway; rather, they belong to the entire community and should be safe and inviting for all, including vulnerable individuals like children, elderly, and people with disabilities.
- **Support communities.**
 - » Make sure those most affected by underpass activity share their stories.
 - » Hold community engagement events, and encourage stakeholders to articulate and/or illustrate their ideas in engagement meetings. Use these events to solicit feedback about the underpass's existing conditions, and the proposed work.
 - » Urge community members to submit their project to Oakland's Capital Improvement Program.¹
 - » If an encampment is present, work with City staff and community-based organizations to iterate in working compassionately and collaboratively with the unhoused people living there.
- **Consider including consultants.** Design and engineering consultants, public art consultants and artists, and community-based organizations, can illustrate and communicate the project and its benefits to stakeholders and community
 - » Make sure consultants reach out to stakeholders such as persons with disability (e.g., mobility, vision, cognitive, etc.) to ensure the design is ADA compliant and does not adversely affect or reduce access.
- **Check for a larger project or existing community efforts in progress in your area of interest.**

¹<https://www.oaklandca.gov/topics/capital-improvement-program>

SECTION 2

An Overview of Oakland's Underpasses

HISTORICAL CONTEXT

Today, Oakland has at least 85 underpasses. Most are concentrated in the city's downtown and near the waterfront.

Urban freeways create social, spatial, and economic challenges at the local level, such as divided neighborhoods and restricted mobility and access to those neighborhoods. Most of these issues have roots in urban renewal that unfolded across the United States in the 1950s. In Oakland, to increase property values and catalyze investment in downtown Oakland, the Oakland Planning Commission condemned and demolished disinvested neighborhoods, many of which were Black cultural and economic hubs. This effort introduced three interstate highways—I-880 (Nimitz), I-980 (Grove Shafter), and I-580 (MacArthur)—whose construction likewise destroyed neighborhoods and displaced residents.

In 1963, an Oakland city ordinance banned trucks from I-580, which passes through the Oakland hills. Truck traffic was thus relegated to I-880, which traverses Oakland's flatlands

Sources and Recommended Reading

"Special Route Restriction History - Route 580," Caltrans, <https://dot.ca.gov/programs/traffic-operations/legal-truck-access/restrict-route-580>.

Eli Moore, Nicole Montojo, and Nicole Mauri, *Roots, Race, and Place: A History of Racially Exclusionary Housing in the San Francisco Bay Area* (Berkeley: Haas Institute, 2019).

Richard Rothstein, *The Color of Law* (New York: Norton, 2017).

Mitchell Schwarzer, *Hella Town: Oakland's History of Development and Disruption* (Berkeley: University of California Press, 2021).

near the waterfront. As a result, Oaklanders living in the flatlands carry higher air-quality burdens than those living in the hills.

Since their construction, freeways have continued to damage the neighborhoods they divide. Raised freeways were designed to channel vehicles—not to enhance the lives of people residing beneath them. Because they are built at the vehicular scale, freeway and underpass infrastructure make it especially dangerous for pedestrians to safely walk through these spaces.

This toolkit provides ways to transform underpasses into safe spaces for pedestrians and people on bikes. The underpasses that separate Oakland from the waterfront and its neighborhoods are complex spaces, in terms of who uses them, who regulates them, and who manages them. This toolkit strives to acknowledge this breadth, and ultimately to reconnect Oakland as a walkable continuum supportive of the health, culture, and investment within all its communities.

OAKLAND'S UNDERPASSES

LISTED BY SURFACE STREET CROSSING

1 Beach St	34 W Grand Ave	64 29th St
2 Mandela Pkwy	35 7th St	65 30th St
3 Hollis St	36 Mandela Pkwy/3rd St	66 W MacArthur Blvd
4 Peralta St	37 Adeline St	67 40th St
5 Adeline St	38 Market St	68 42nd St
6 SanPablo Ave	39 Brush St	69 45th St
7 Market St	40 Castro St	70 Martin Luther King Jr Way
8 West St	41 Martin Luther King Jr Way	71 52nd St
9 Martin Luther King Jr Way	42 Jefferson St	72 Shattuck Ave
10 Highway 24*	43 Washington St	73 55th St
11 Telegraph Ave	44 Broadway	74 56th St
12 Webster St	45 Webster St	75 Telegraph Ave
13 Broadway	46 Webster Pl	76 Claremont Ave
14 Piedmont Ave	47 Posey Tube	77 Hudson St
15 Richmond Blvd	48 Jackson St	78 Forest Ave
16 Harrison Ave	49 Madison St	79 College Ave
17 Oakland Ave	50 Oak St	80 Presley Way
18 Grand Ave	51 Channel Park Trail	81 Patton St
19 Lakeshore Ave	52 5th Ave	82 Golden Gate Ave
20 Park Blvd	53 Del Monte St	
21 Beaumont Ave	54 Fruitvale Ave	83 Broadway
22 14th Ave	55 42nd Ave*	84 Broadway Terrace
23 Fruitvale Ave	56 High St	85 Moraga Ave
24 Flagg Ave	88 Maritime St	86 Carson St
25 Champion St	89 Admiral Toney Way	87 Calaveras Ave
26 Coolidge Ave		
27 Maple St	57 27th St	90 98th Ave*
28 High St	58 Sycamore St	
29 MacArthur Blvd	59 Martin Luther King Jr Way	
30 Buell St	60 W Grand Ave	
31 Kuhnle Ave	61 San Pablo Ave	
32 Edwards Ave	62 7th St	
33 Golf Links Rd	63 6th St	
	63a Castro St	

I-580

I-880

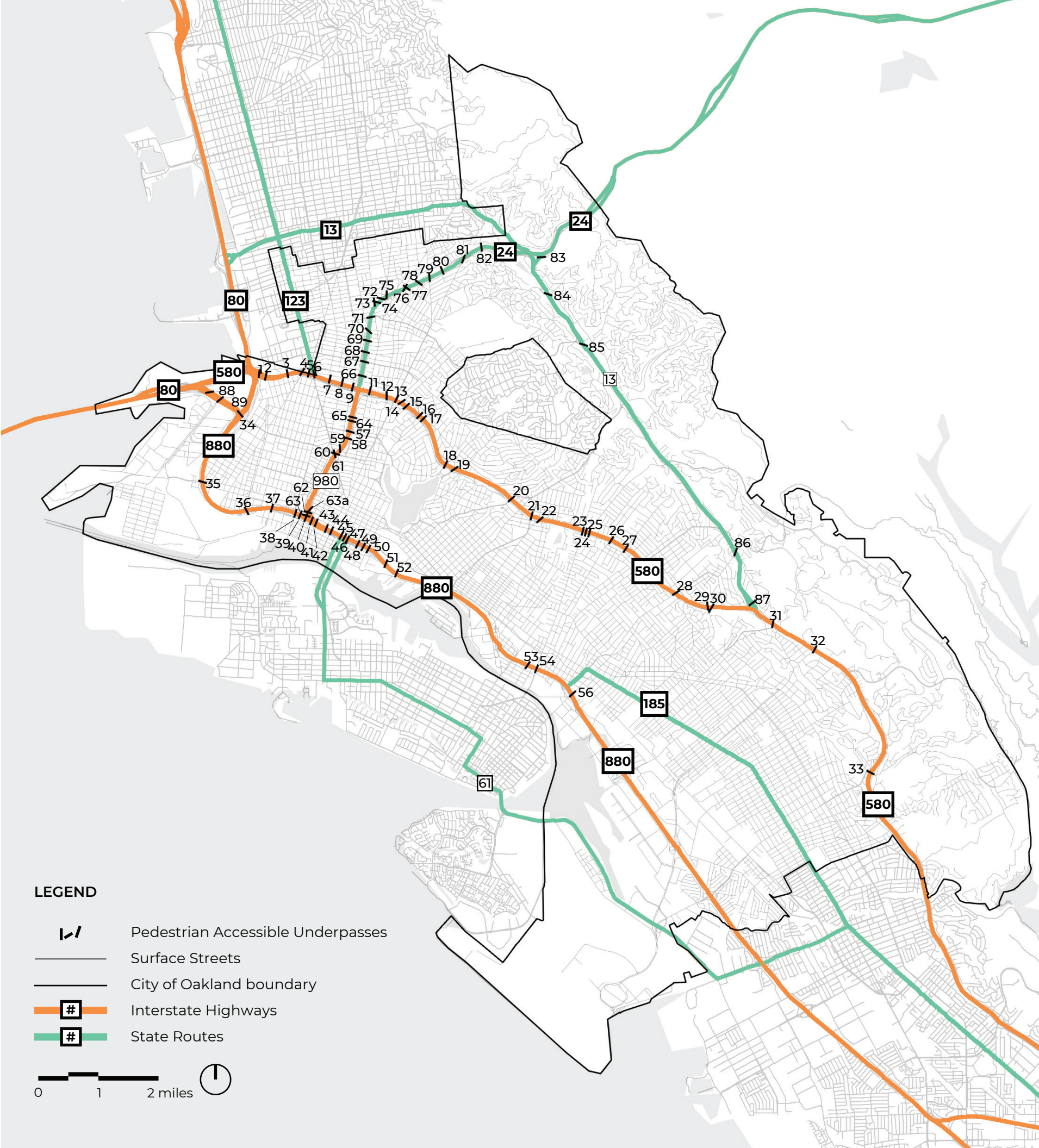
I-980

SR-24

SR-13

SR-61

*Unaccessible to pedestrians



LEGEND

- Pedestrian Accessible Underpasses
- Surface Streets
- City of Oakland boundary
- Interstate Highways
- State Routes



PRIORITY NEIGHBORHOODS

OakDOT aims to prioritize underpass improvement projects in neighborhoods according to the social equity and street safety impacts they experience. For the City, this prioritization means that race, ethnicity, gender, age, disability, sexual orientation, and expression do not negatively influence how resources, opportunities, and outcomes for residents are distributed.

Presently, pedestrian safety in Oakland is highly inequitable as priority neighborhoods disproportionately experience traffic safety impacts. The 2018 Oakland Equity Indicators Report scored pedestrian safety as 1 out of 100.¹

The map on the following page illustrates an approach to prioritizing underpasses for investment. It combines data from OakDOT's Geographic Equity Toolbox, which designates census

tracts as priority neighborhoods from highest to lowest priority.² Priority neighborhoods measure the need for more equitable distribution of resources and opportunities, from highest need (darkest purple on the map on the next page) to lowest (lightest purple).

Priority is defined by seven demographic factors: people of color, low-income households, people with disability, seniors 65 years and over, single-parent families, severely rent-burdened households, and low educational attainment. The map also includes data from the OakDOT Safety Map³, which highlights the high-injury corridors, where the most severe and fatal crashes have occurred, and the CalEnviroScreen outputs showing Census tracts disproportionately burdened by, and vulnerable to, multiple sources of pollution.⁴

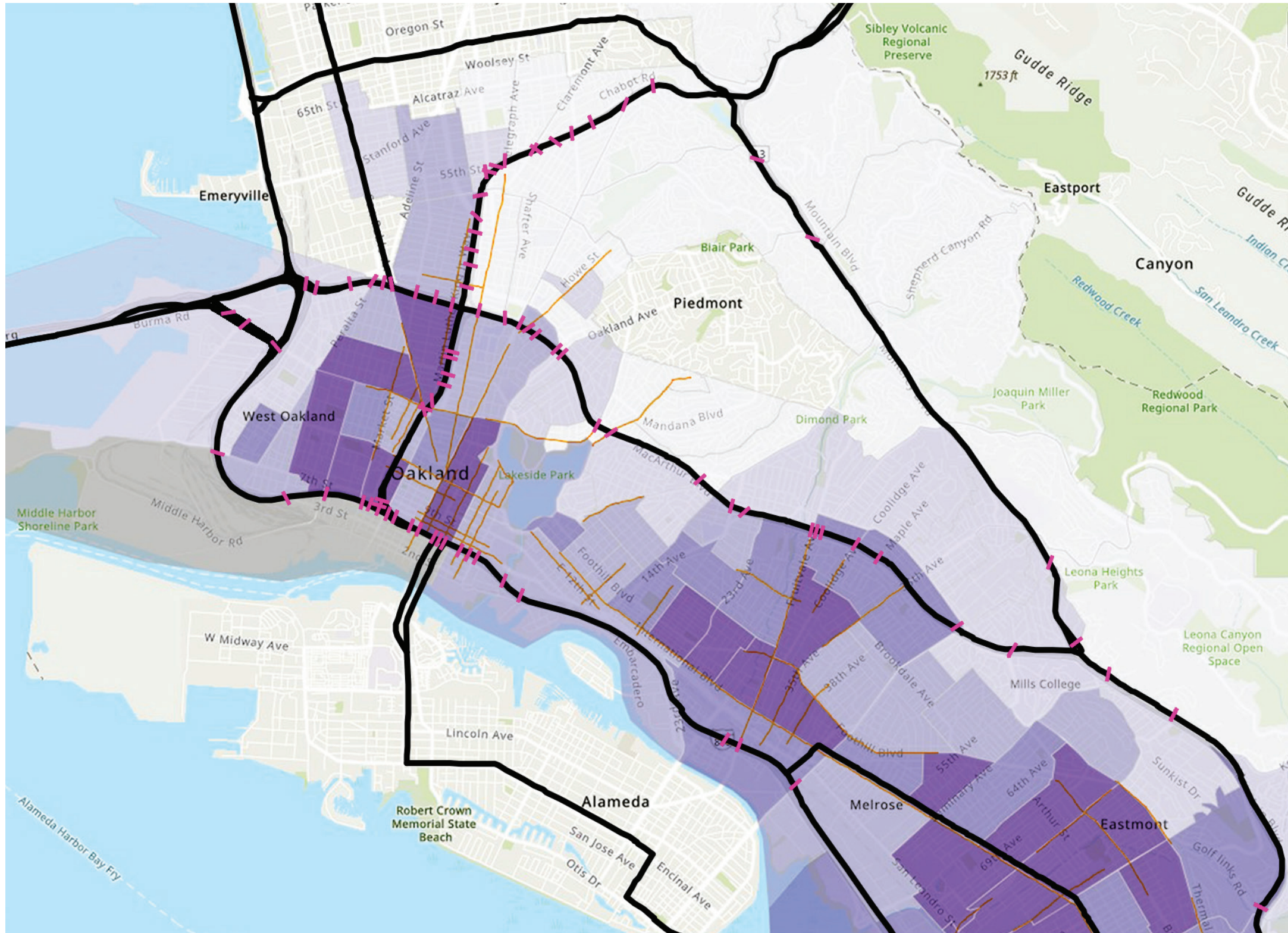
¹ Oakland Equity Indicators Report, 2018, <https://cao-94612.s3.amazonaws.com/documents/2018-Equity-Indicators-Full-Report.pdf>.

² Geographic Equity Toolbox, OakDOT, <https://www.oaklandca.gov/resources/oakdot-geographic-equity-toolbox>.

³ Oakland Safety Map, OakDOT, <https://oakgis.maps.arcgis.com/apps/MapSeries/index.html?appid=fd47784582294d7b87cfb3ee1b047ea8>.

⁴ "How pollution impacts health in West Oakland," Environmental Defense Fund, University of Texas at Austin, and the West Oakland Environmental Indicators Project, <https://www.edf.org/airqualitymaps/oakland/pollution-and-health-concerns-west-oakland>.

PRIORITY NEIGHBORHOODS MAP 1: EQUITY & PEDESTRIAN SAFETY



The map at left shows priority neighborhoods for underpass transformation. It suggests a method to prioritize underpass improvements across the city's underpasses.

LEGEND

PRIORITY NEIGHBORHOODS

- HIGHEST
- HIGH
- MEDIUM
- LOW
- LOWEST
- NO DATA

HIGH-INJURY NETWORK

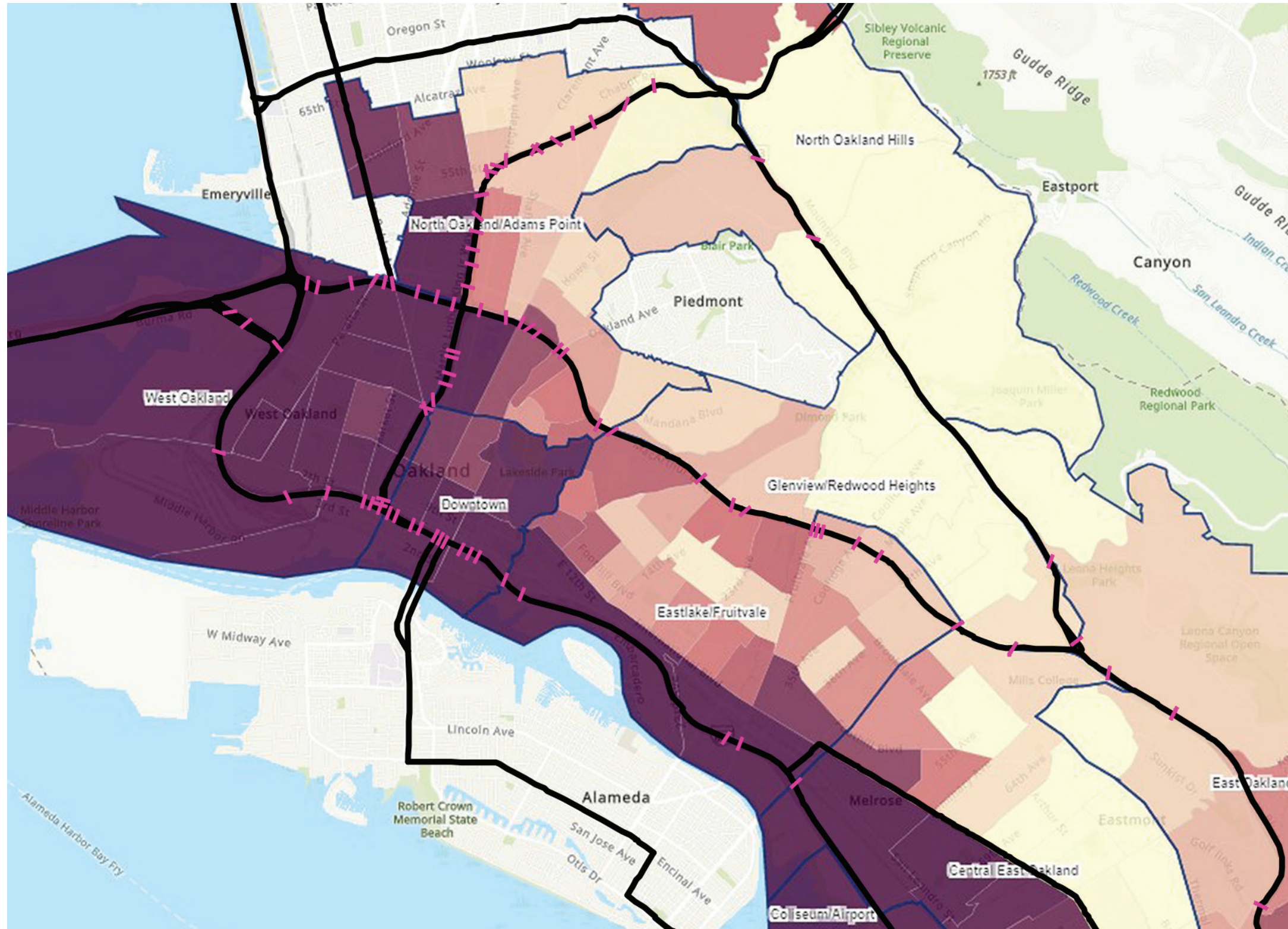
FREEWAYS AND MAJOR ROUTES

- FREEWAYS AND MAJOR ROUTES
- PEDESTRIAN ACCESSIBLE UNDERPASS



¹ Map data from Priority Neighborhoods and Planning Areas, <https://oakgis.maps.arcgis.com/apps/webappviewer/index.html?id=167a1a636a0a4480a0e0592ad340e52b>

PRIORITY NEIGHBORHOODS MAP 2: POLLUTION BURDEN

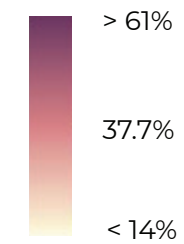


The map at left shows 2018 data from CalEnviroScreen. From light yellow to dark purple, each census tract carries a lesser to greater burden of the state's pollution.

This measurement accounts for "seven Exposure Indicators (ozone and PM2.5 concentrations, diesel PM emissions, drinking water contaminants, pesticide use, toxic releases from facilities, and traffic density) and five Environmental Effects Indicators (cleanup sites, impaired water bodies, groundwater threats, hazardous waste facilities and generators, and solid waste sites and facilities).

LEGEND

POLLUTION BURDEN STATEWIDE PERCENTILE



FREEWAYS AND MAJOR ROUTES

FREEWAYS AND MAJOR ROUTES

PEDESTRIAN ACCESSIBLE UNDERPASS



¹ Map data from OakDOT Geographic Equity Toolbox, <https://oakgis.maps.arcgis.com/apps/MapSeries/index.html?appid=fd47784582294d7b87cfb3ee1b047ea8>

PRIORITIZING PEDESTRIANS: TRAFFIC SAFETY & ACCESSIBILITY

Underpasses, like all streets, are subject to codes and regulations that create a safe landscape for pedestrians. The following resources are important starting points addressing traffic safety and accessibility in the context of underpass improvement.

- **Accessible Pedestrian Signals (APS):** http://www.apsguide.org/chapter1_aps.cfm
- **Accessible Shared Streets: Notable Practices and Considerations for Accommodating Pedestrians with Vision Disabilities:** <https://www.trb.org/PedestriansAndBicyclists/Blurbs/176827.aspx>
- **Caltrans Design Information Bulletin 82-06, "Pedestrian Accessibility Guidelines for Highway Projects"** (<https://dot.ca.gov/-/media/dot-media/programs/design/documents/dib82-06-ally.pdf>)
- **Detectable Warnings:** <https://www.access-board.gov/prowag/other/dw-update.html>
- **Guidelines and Standards for ADA Features in the Public Right of Way - Oakland Public Works Bureau of Engineering and Construction:** <http://www2.oaklandnet.com/oakcal/groups/pwa/documents/policy/oak056363.pdf>
- **Leading Pedestrian Interval:** <https://nacto.org/publication/urban-street-design-guide/intersection-design-elements/traffic-signals/leading-pedestrian-interval/>
- **Public Rights-of-Way Accessibility Guidelines (PROWAG):** <https://www.adainfo.org/sites/default/files/1.4-Public-Rights-of-Way-2-slides-per-page.pdf>
- **Safe Oakland Streets:** <https://www.oaklandca.gov/topics/safe-oakland-streets>, specifically, the **Crash Prevention Street Design Toolkit** (<https://cao-94612.s3.amazonaws.com/documents/CMF-toolkit-PUBLIC.pdf>)

SECTION 3

Underpass Study Area & Analysis

OUR UNDERPASSES TODAY

Before developing general strategies for improvement, the design team took the following steps to understand the context of Oakland's underpasses:

- **Established a study area.** *Walk This Way* focuses on the Nimitz Freeway's underpasses that connect Jack London and the waterfront with Chinatown and Old Oakland.
- **Context analysis.** More than ten underpasses in this area are essential to pedestrian mobility and neighborhood connectivity, but they prioritize moving vehicles over accommodating pedestrians.
- **Site Analysis: 4 underpasses selected as a study area.** The toolkit's study area highlights four underpasses beneath I-880: at Oak, Madison, Jackson, and Webster Streets.
 - » The design team walked the underpasses and noted patterns in vegetation, signage, fencing, airspace*, utilities, and visibility, and notable large-scale infrastructure such as on/off-ramps and embankments.
 - » Acoustics and lighting consultants took measurements to determine the existing levels of light and sound in the underpasses (see Appendices C and D).
 - » The design team performed a qualitative analysis of each underpass: annotated pedestrian-view photographs, plan and section drawings describing relationships between pedestrians and surrounding uses and transportation, and a summary of existing conditions (included in the following pages).

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*Airspace refers to the land beneath the freeway owned by Caltrans. It is leased out to public or private entities, and is most commonly used for parking.

OUR UNDERPASSES TODAY

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- **Held a focus group and solicited feedback from Caltrans**, in which we learned:
 - » Maintenance agreements are an essential part of underpass improvements.
 - » Non-transportation activities (like skateboarding) occurring in the Caltrans right-of-way can impede project approval.
 - » Projects may encounter obstacles if underpass improvement work impacts Caltrans' ability to visually inspect bridge structures. To avoid this, it is recommended to apply aesthetic features and art to abutment and wing walls.
 - » For more information on design proposals Caltrans may accept, please see the guide to the Transportation Art Program¹ and the Community Identification² and Gateway Monument Programs.³

- **Compiled a summary of existing conditions.** After visiting each of the four underpasses, we identified commonalities and differences between the underpasses.

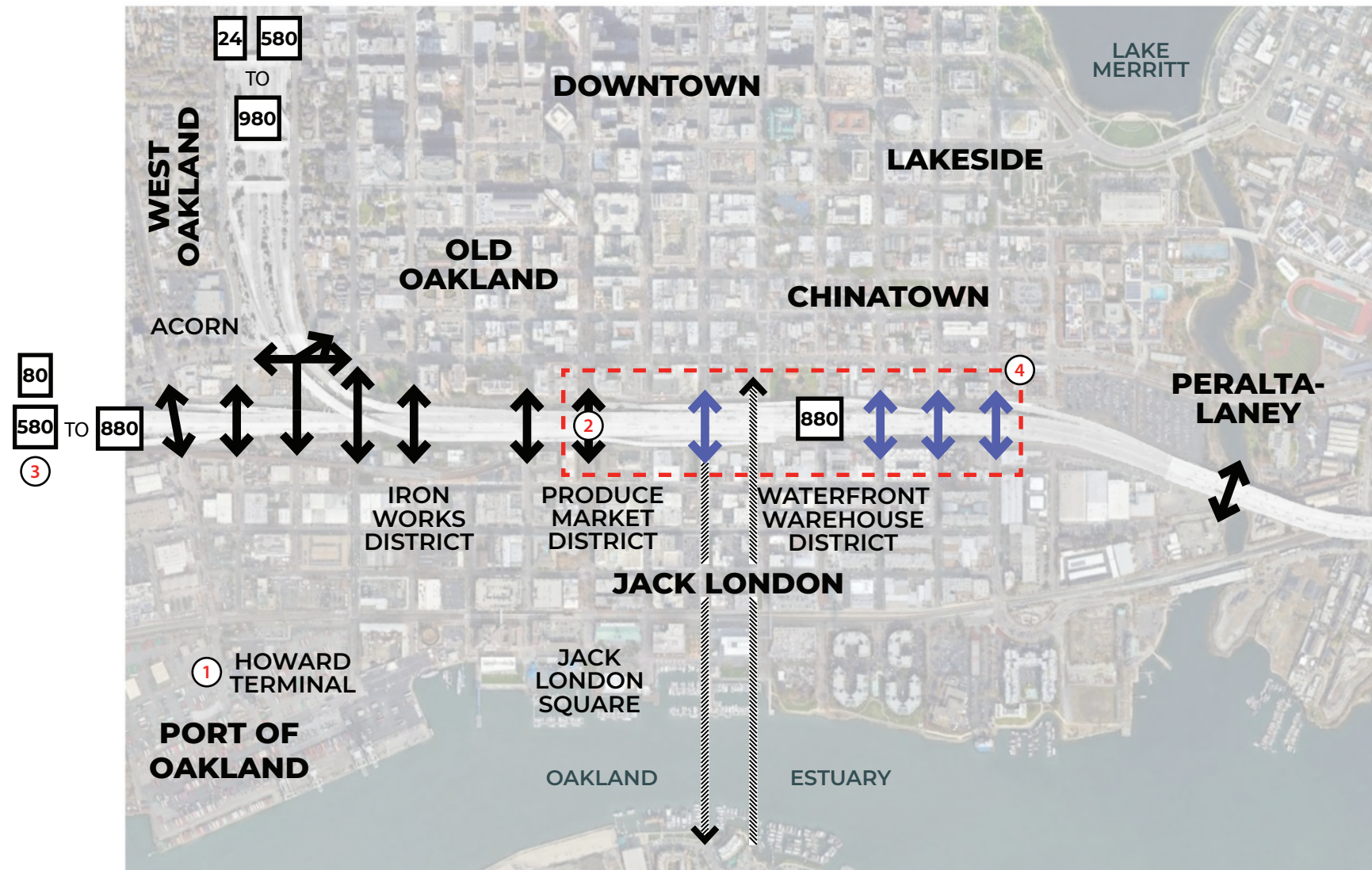
¹<https://dot.ca.gov/programs/design/lap-landscape-architecture-and-community-livability/lap-liv-j-transportation-art>

²<https://dot.ca.gov/programs/design/lap-landscape-architecture-and-community-livability/lap-liv-c-community-identification>

³<https://dot.ca.gov/programs/design/lap-landscape-architecture-and-community-livability/lap-liv-d-gateway-monuments>

STUDY AREA CONTEXT: FREEWAYS, NEIGHBORHOODS & OPPORTUNITIES

Freeway infrastructure overlays and divides neighborhoods, and underpasses challenge pedestrian safety and mobility



LEGEND

- ↕ UNDERPASS
- ↕ STUDY AREA UNDERPASS

STUDY AREA OPPORTUNITIES COORDINATION

- ① WATERFRONT BALLPARK DISTRICT
- ② DRAFT DOWNTOWN OAKLAND SPECIFIC PLAN
- ③ GOPORT PROJECT
- ④ OAKLAND ALAMEDA ACCESS PROJECT

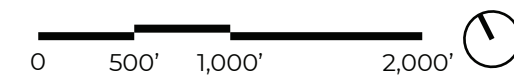
880 MAJOR ROUTES

↕↕ OAKLAND-ALAMEDA VEHICULAR & BICYCLE ACCESS BY TUNNEL

NEIGHBORHOOD

DISTRICT

WATERFRONTS



"The I-980 and I-880 **freeway crossings** separate the downtown core from West Oakland, Jack London, and other surrounding neighborhoods. The **access roads** adjoining the freeways and **on/off-ramps** are unpleasant walking environments that disrupt the pedestrian grid and create a barrier to walking safely to downtown from surrounding neighborhoods."¹

¹ Downtown Oakland Specific Plan Public Review Draft Plan (08/28/2019)

STUDY AREA OPPORTUNITIES COORDINATION

Underpass improvements should be coordinated with or integrated into active or upcoming projects in the surrounding neighborhoods. In the toolkit's study area, major projects which would benefit from pedestrian safety within and beyond underpasses include the following:

- **Waterfront Ballpark District at the Howard Terminal (A's Howard Terminal).**
As considered in the Draft Environmental Impact Report:

- » BART Wayfinding and I-880 Underpass Improvements: The wayfinding program would enhance the freeway underpasses with improved lighting, aesthetics, and placemaking so the underpasses are more inviting to pedestrians walking to the ballpark (non-CEQA recommendation)
- » Market Street: Enhance the freeway underpass with improved lighting, aesthetics, "placemaking," and wayfinding, and relocate the fence line to maximize clear space at sidewalk obstacles while keeping the existing curb line (non-CEQA recommendation)
- » Broadway: Revisit the public art at the back of the sidewalks between 5th and 6th Streets to expand the available sidewalk space for patrons walking to and from the ballpark, and enhance the freeway underpass with improved lighting, aesthetics, "placemaking," and wayfinding (non-CEQA recommendation) existing conditions (included in the following pages)

For more information, visit: <https://www.oaklandca.gov/projects/oakland-waterfront-ballpark-district>

- **Draft Downtown Oakland Specific Plan**

- » Broadway between 4th Street and 7th Street: Transform the areas around, under, and through the I-880 freeway underpass into a beautiful, safe, walkable, inviting, green, and iconic passageway connecting downtown Oakland and the waterfront.

For more information, visit: <https://www.oaklandca.gov/topics/downtown-oakland-specific-plan>

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- **GoPort Project**

- » 7th Street Grade Separation East Segment: Replace existing railroad underpass between I-880 and Maritime Street to increase clearance for trucks, and improve shared pedestrian and bicycle path along 7th Street (Alameda CTC, 2020a)

For more information, visit: <https://www.alamedactc.org/programs-projects/goport-program/>

- **Oakland Alameda Access Project**

- » The proposed project includes improvements to the underpasses at Broadway, Webster, Harrison, Jackson, Madison, and Oak Streets, between 5th and 6th Streets

For more information, visit: <https://oaklandalamedaaccessproject.com/>

4 STUDY AREA UNDERPASSES

The decision to focus on the four underpasses at Oak, Madison, Jackson, and Webster Streets originates in the Lake Merritt Station Area Plan (adopted in December 2014). It called for improved pedestrian and bicyclist access to the Lake Merritt BART Station, specifically at intersections and freeway underpasses. These four underpasses were identified as “case studies” to be examined in an underpass improvement toolkit that could ultimately aid in the broader realm of underpass improvements throughout Oakland.

In 2016, Walk This Way was originally an initiative to knit three neighborhoods together—Chinatown, Old Downtown, and Jack London—that had been cut off from one another for decades by the I-880. It also sought to facilitate access to the fast-developing waterfront area to the west. The project was intended as a scoping

effort to re-design the Broadway and Webster underpasses.

At that time, the Planning and Building Department was the lead on the project, undergoing an extensive two-year outreach process. They worked with community-based organizations in the general area and recruited members to form a Stewardship Committee that guided the development of the toolkit’s scope of work. Committee members included staff from, but not limited to, the City’s Planning and Building Department, the City Administrator’s Office, the Department of Transportation, the Jack London Improvement District, City Council, and the Department of Economic and Workforce Development.

In 2019, the project shifted from the Planning and Building Department to the Department of Transportation. Staff continued

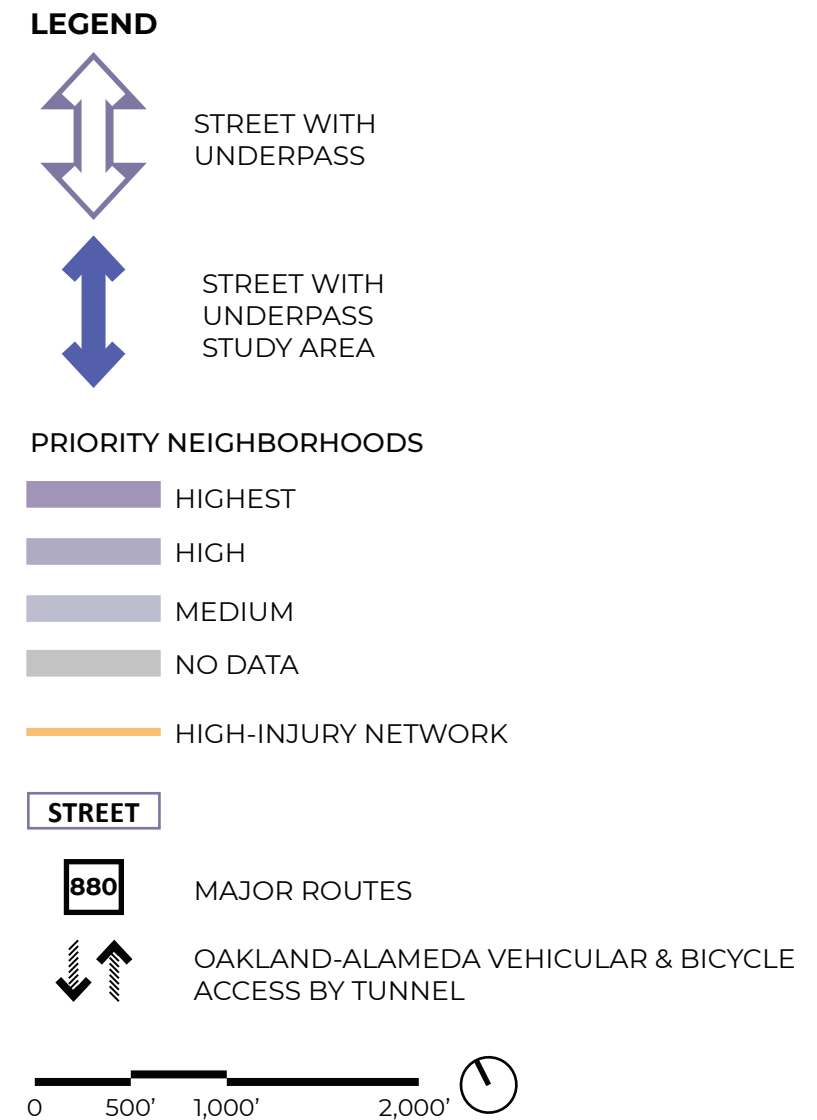
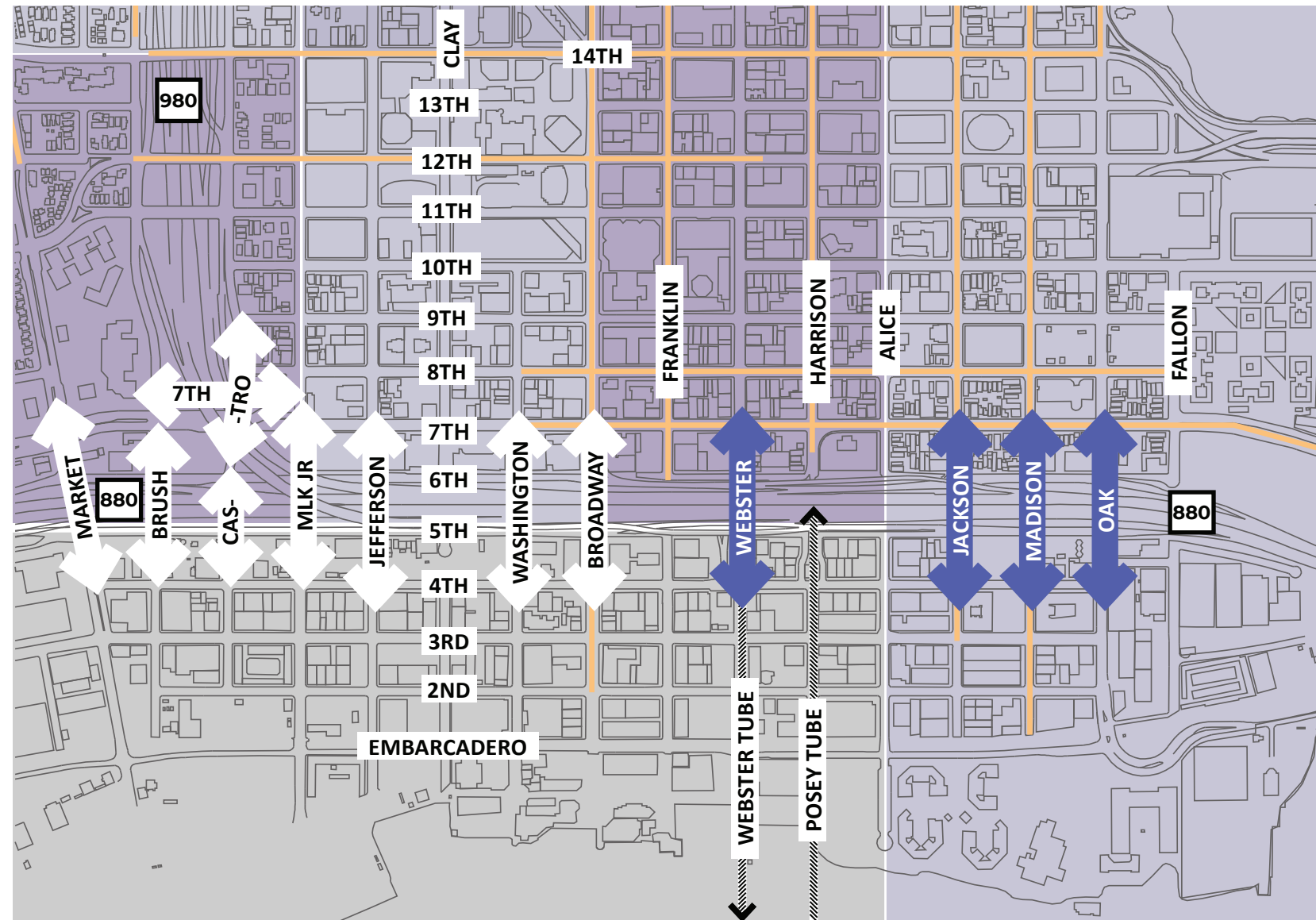
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to study how project feasibility and coordination between different internal and external stakeholders could successfully deliver improvements within freeway underpasses and more specifically within the Caltrans right of way.

The San Francisco Bay Area Metropolitan Transportation Commission (MTC) funded this project through Safe Routes to Transit funding to the City of Oakland Department of Planning and Building and Department of Public Works in 2014.

4 STUDY AREA UNDERPASSES



In Chinatown:

1. 57% of people walk or take public transit to work;
2. Over 70% of people speak a language other than English at home;
3. 39.5% of residents are 65 years old or older.¹

30% of streets in majority-Asian census tracts fall within the City of Oakland High Injury Network for pedestrians, the highest percentage of any ethnicity.²

MAP: Layers from Priority Neighborhoods and Planning Areas, <https://oakgis.maps.arcgis.com/apps/webappviewer/index.html?id=167a1a636a0a4480a0e0592ad340e52b>

¹ U.S. Census Bureau (2019). American Community Survey 5-year estimates. Retrieved from Census Reporter Profile page for Census Tract 4030, Alameda, CA, <<http://censusreporter.org/profiles/14000US06001403000-census-tract-4030-alameda-ca/>>

² Oakland Equity Indicators Report, 2018, <<https://cao-94612.s3.amazonaws.com/documents/2018-Equity-Indicators-Full-Report.pdf>>

EXISTING CONDITIONS: OAK STREET UNDERPASS

OAK STREET UNDERPASS FACING NORTH



OAK STREET UNDERPASS FACING SOUTH



VEGETATION

① Mature street trees parallel to I-880

SIGNAGE

② Crosswalks at every street crossing; traffic & walk signals

③ Directional signage for on/off-ramp traffic

FENCING

④ 50% permeable galvanized steel picket fence

⑤ Chain link with screening; locked gates

AIRSPACE

⑥ Oak Street community cabins; parking

ON/OFF-RAMP

⑦ Greater fluctuations of vehicular speeds

UTILITIES

⑧ New utilities adjacent to, within sidewalk

EMBANKMENT

⑨ Dense groundcover, mature trees

VISIBILITY

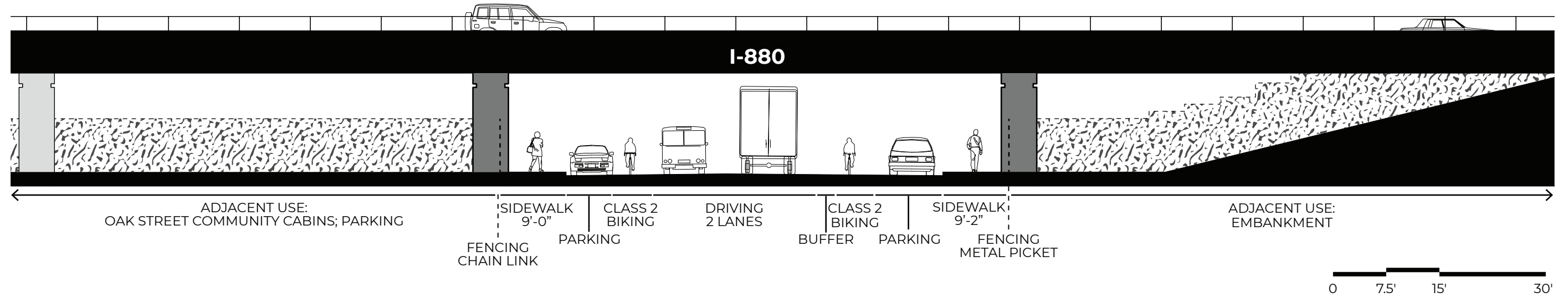
⑩ High-contrast darkness in underpass

HABITAT

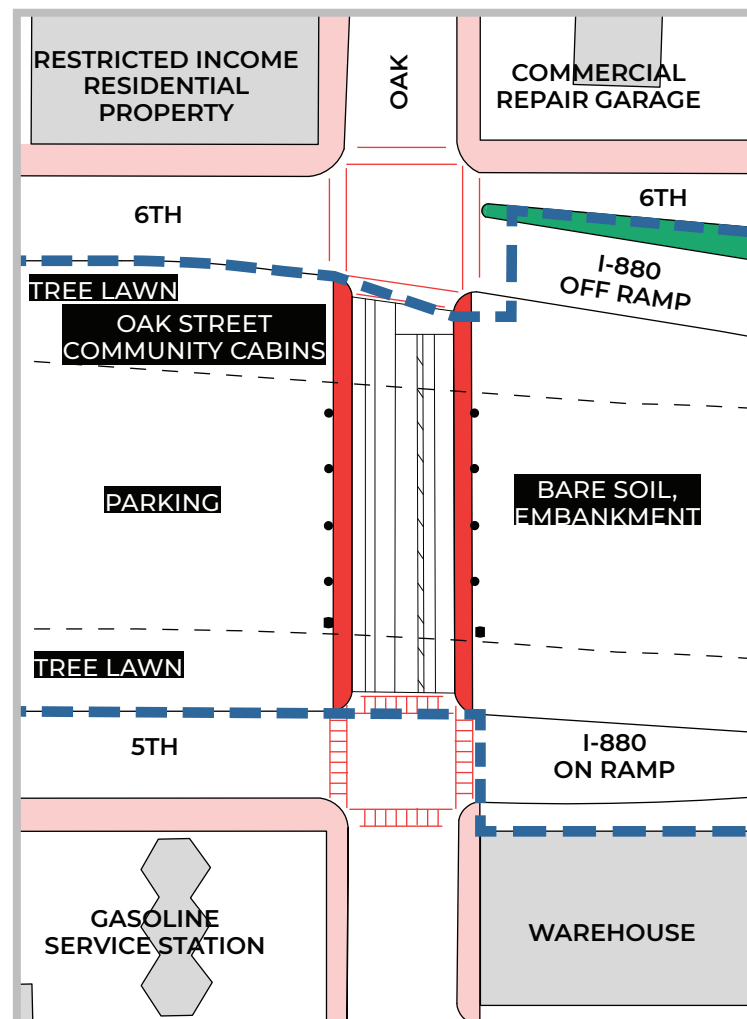
⑪ Pigeon habitat in underpass yields problematic droppings

EXISTING CONDITIONS: OAK STREET UNDERPASS

OAK STREET UNDERPASS SECTION FACING NORTH



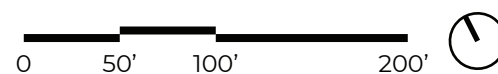
PLAN VIEW



LEGEND

- - - - CALTRANS PROPERTY
- - - - I-880 FREEWAY ROAD WIDTH
- ■ I-880 FREEWAY COLUMNS
- █ SIDEWALK AT UNDERPASS
- █ SIDEWALK IN CONTEXT
- ▤ ▥ CROSSWALK STRIPING
- █ MEDIAN

ADJACENT USE



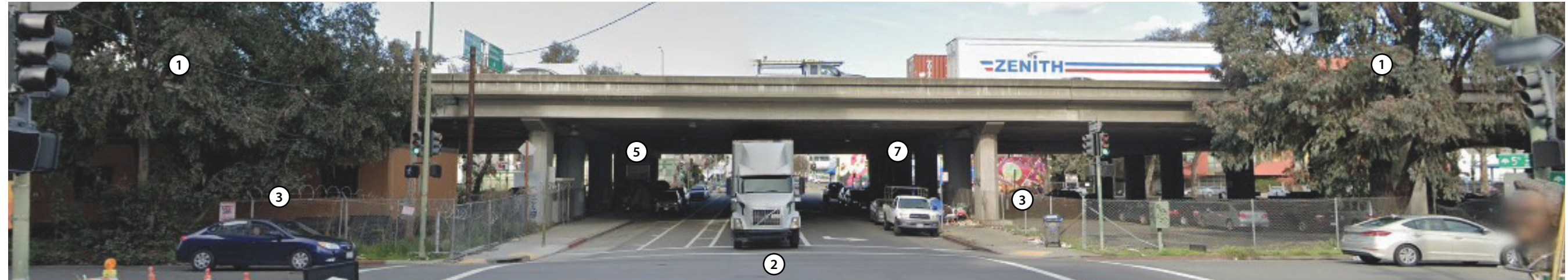
EXISTING CONDITIONS: OAK STREET UNDERPASS



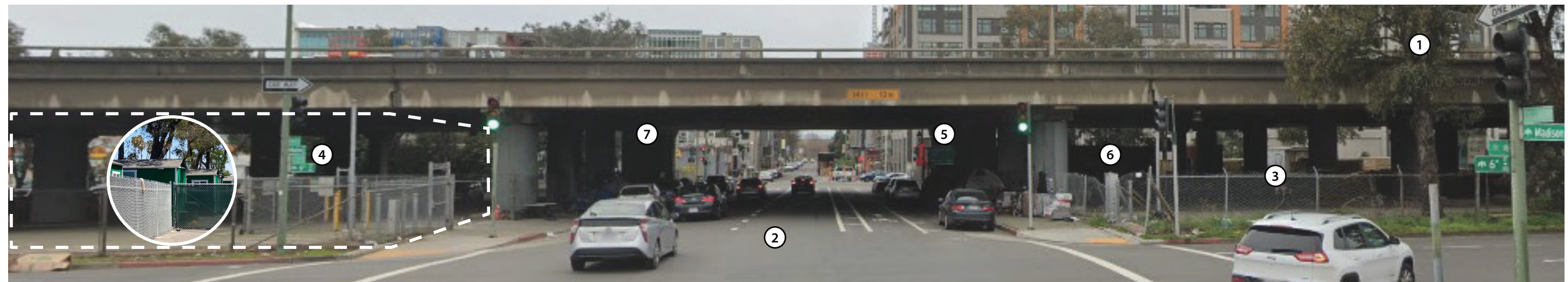
UNDERPASS SIZE	14'5" high, 130' deep		
SIDEWALK SIZE	East: 9'2" / West: 9'		
ADJACENT USES	East: sloped soil embankment West: Airspace leased for Oak Street Community Cabins (north of freeway); parking beneath and south of freeway Freeway on- and off-ramps introduce additional tension between pedestrian crossings and freeway traffic		
FENCING	East: Chain-link fence (6'), permeable metal picket fence (7'-6" - 8') West: Chain-link fence (6'), with privacy screening at/near Cabins; gates secured with locks, chains, and electronic keypads		
VEGETATION	East: Sloped embankment, bare soil in shade and wild growth in sun West: Mature trees parallel to the freeway Weeds and overgrown vegetation on both sides		
SIGNAGE	Signage for drivers leaving off-ramp for landmark orientation, for approaching freeway on-ramp; restrictive pedestrian signage		
STRIPING	Crosswalks exist at each approach to underpass; one crosswalk split by median		
ACOUSTICS	Day-night average sound level: Avg Leq (h) :	On street - 73 dBA On street - 68 dBA	At underpass - 75 dBA At underpass - 70 dBA
VISIBILITY	Embankment area is dark during day and night; this contrast reduces the sense of safety and security for pedestrians		

EXISTING CONDITIONS: MADISON STREET UNDERPASS

MADISON STREET UNDERPASS FACING NORTH



MADISON STREET UNDERPASS FACING SOUTH



VEGETATION

① Mature street trees parallel to I-880

SIGNAGE + STRIPING

② Crosswalk striping at 7/8 of crossings; crossing signals

FENCING

③ Chain link, secure gates, screening at Community Cabins, razor wire

SIGNAGE

④ Bilingual street signs in Chinatown

ON/OFF-RAMP

⑤ Directional signage for freeway traffic in sidewalk

UTILITIES

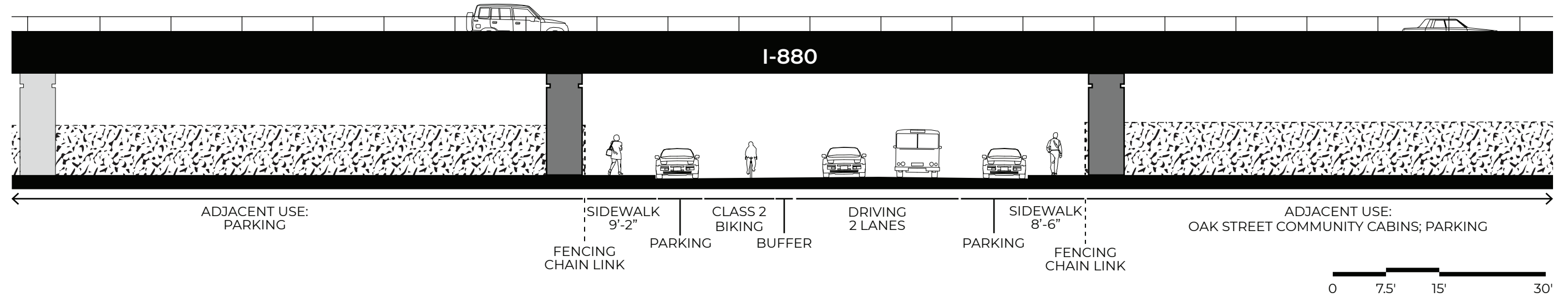
⑥ New utilities adjacent to and within sidewalk

VISIBILITY

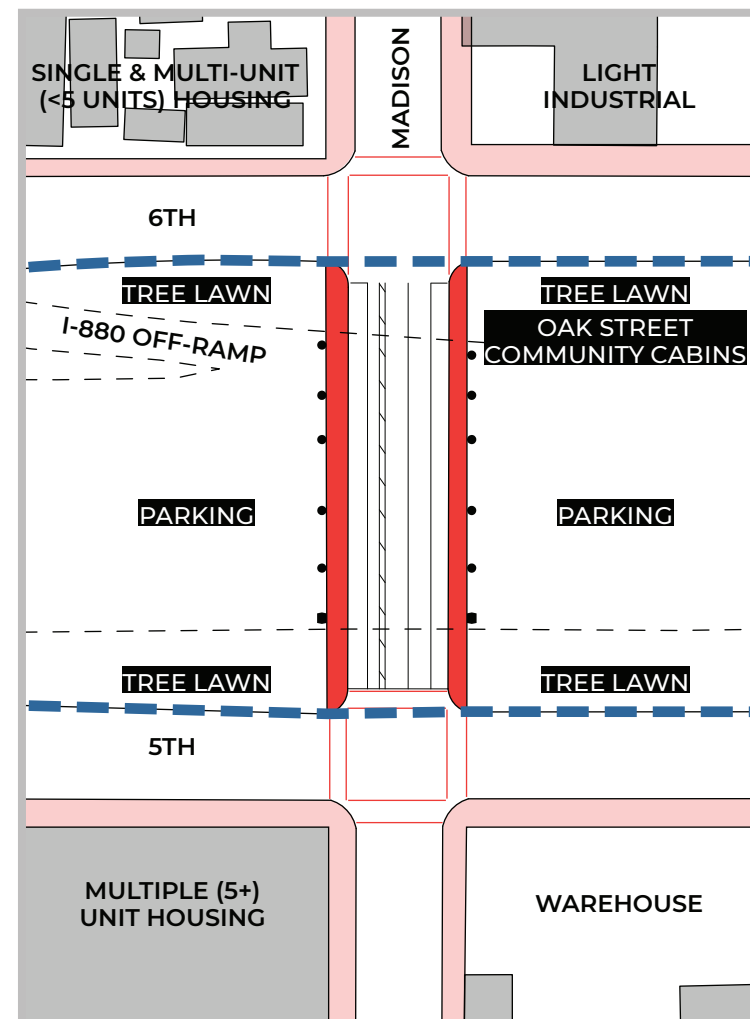
⑦ High-contrast darkness in underpass

EXISTING CONDITIONS: MADISON STREET UNDERPASS

MADISON STREET UNDERPASS SECTION FACING NORTH



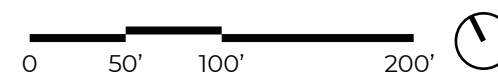
PLAN VIEW



LEGEND

- - - - CALTRANS PROPERTY
- - - - I-880 FREEWAY ROAD WIDTH
- ■ I-880 FREEWAY COLUMNS
- █ SIDEWALK AT UNDERPASS
- █ SIDEWALK IN CONTEXT
- ▤ ▤ ▤ ▤ ▤ ▤ ▤ ▤ ▤ ▤ CROSSWALK STRIPING
- █ MEDIAN

ADJACENT USE



EXISTING CONDITIONS: MADISON STREET UNDERPASS



UNDERPASS SIZE

14'-10" high, 152' deep

SIDEWALK SIZE

East: 8'9" (minimum) / West: 9'2"

ADJACENT USES

East: Oak Street Community Cabins (north of freeway), parking beneath south of freeway
 West: Barrier between the cabins (temporary housing) and adjacent activity is low compared to typical residential situations

FENCING

East: Chain-link fence (6'), with privacy screening at Cabins
 West: Chain-link fence (6') plus coiled barbed wire
 Gates secured with chains, locks, and electronic keypads; refuse collects along fencelines

VEGETATION

Row of mature trees runs parallel along north and south of freeway; voluntary plants along fenceline and curb

SIGNAGE

Restrictive pedestrian signage along fencing beneath underpass

STRIPING

Crosswalks exist at each approach to underpass

ACOUSTICS

Day-night average sound level:	On street - 76 dBA	At underpass - 78 dBA
Avg Leq (h)	On street - 71 dBA	At underpass - 73 dBA

VISIBILITY

Portions of the sidewalks adjacent to underpass entrances do not meet City illumination standards, reducing pedestrian safety and security

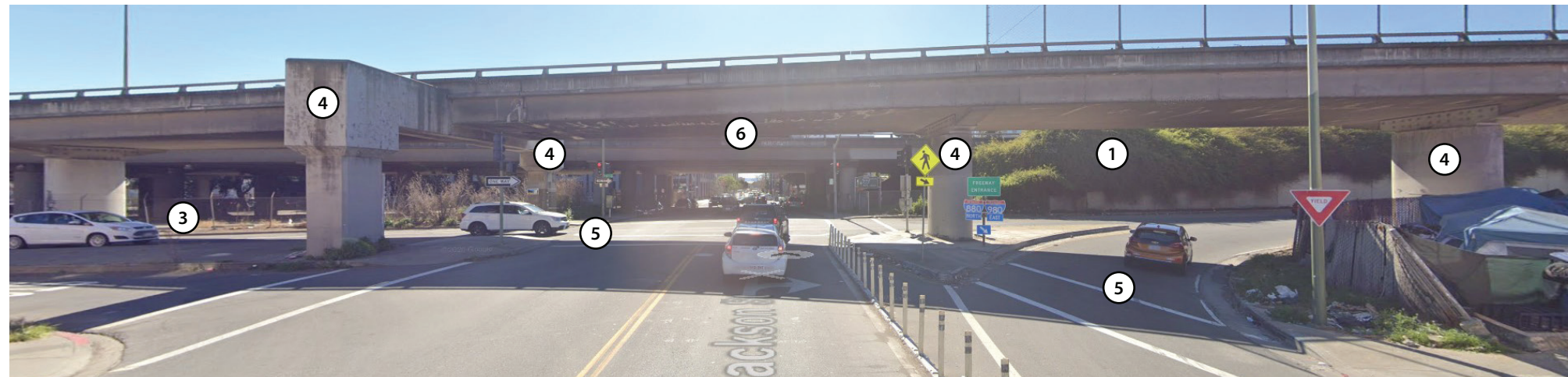
See Appendix B for a side-by-side comparison of existing conditions at each underpass.

EXISTING CONDITIONS: JACKSON STREET UNDERPASS

JACKSON STREET UNDERPASS FACING NORTH



JACKSON STREET UNDERPASS FACING SOUTH



VEGETATION

① Dense shrub coverage at embankment

VEGETATION

② Considerable voluntary plant growth at fenceline

FENCING

③ Chain link, secure gates, barbed wire

FREEWAY STRUCTURE

④ Additional medians and overpass support structures along 6th Street

FREEWAY STRUCTURE

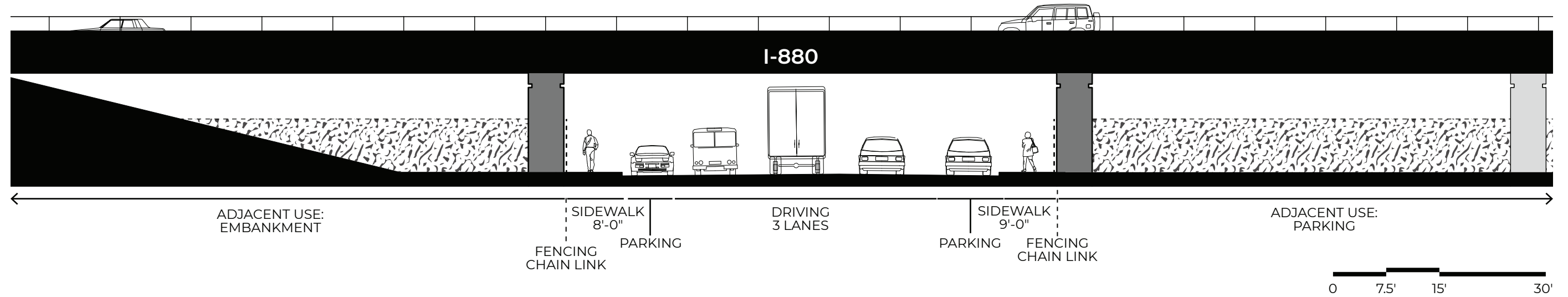
⑤ Traffic flow from freeway off- and on-ramps

VISIBILITY

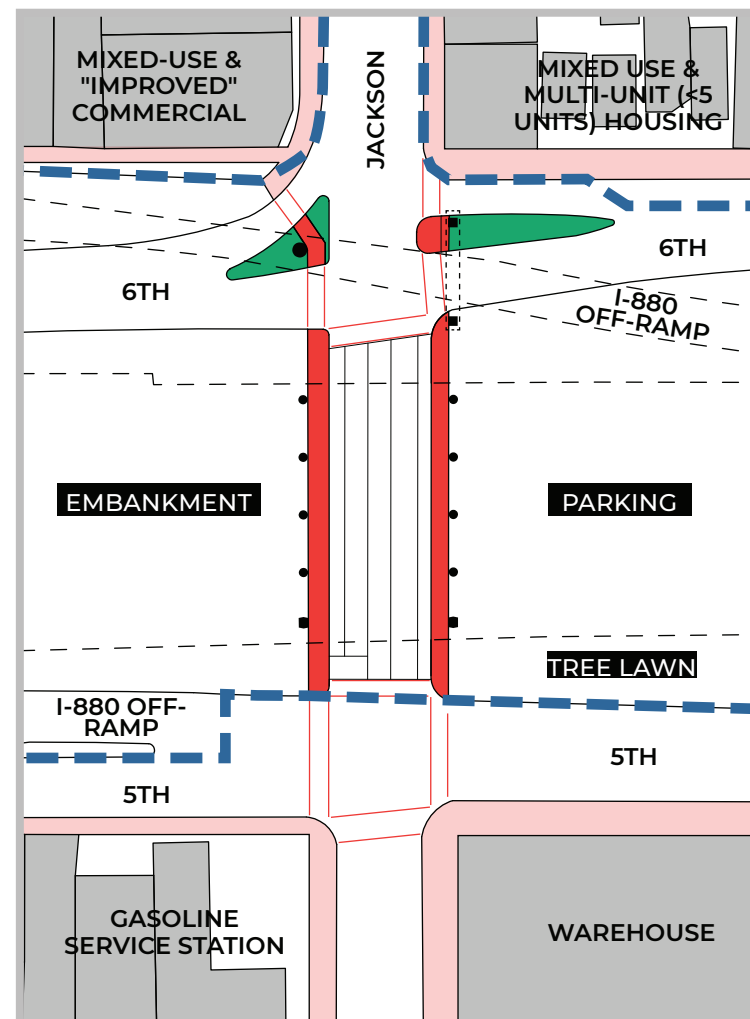
⑥ High-contrast darkness in underpass

EXISTING CONDITIONS: JACKSON STREET UNDERPASS

JACKSON STREET UNDERPASS SECTION FACING NORTH



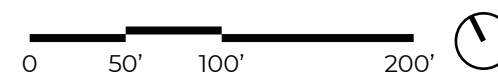
PLAN VIEW



LEGEND

- CALTRANS PROPERTY
- I-880 FREEWAY ROAD WIDTH
- ■ I-880 FREEWAY COLUMNS
- █ SIDEWALK AT UNDERPASS
- █ SIDEWALK IN CONTEXT
- ▤ CROSSWALK STRIPING
- █ MEDIAN

ADJACENT USE



EXISTING CONDITIONS: JACKSON STREET UNDERPASS



UNDERPASS SIZE

Height above cautioning standards, 149' (primary) + 22' (secondary)

SIDEWALK SIZE

East: 9' / West: 8'

ADJACENT USES

Embankment, fenced off, which is currently used for a tent encampment; chair, shaded by mature tree, located at southern end of encampment for an individual to collect money from cars stopping at the freeway off-ramp; parking on east side

FENCING

East: Chain-link fence (6'8"); two forms of barbed wire (coil, three rows)
West: Chain-link fence (6'); individuals in the encampment use found materials for privacy

VEGETATION

This underpass has particularly dense vegetation: along the embankment, ivy and mature pine trees create deeper shade, and bare soil is covered with pine needles; large shrubs create expansive massing; on the east side, voluntary plants have grown above eye-level and encroach on the pedestrian corner where the sidewalk and crosswalk meet

SIGNAGE

Jack London district signage is used across the street (SW corner of 5th Street), elevated on light fixture; freeway on-ramp signage at median; restrictive pedestrian signage

STRIPING

Striping at all intersections; pedestrian signals not installed at some intersections

ACOUSTICS

Day-night average sound level:	On street - 75 dBA	At underpass - N/A
Avg Leq (h):	On street - 70 dBA	

VISIBILITY

Crosswalk illumination adjacent to I-880 on-ramp entrance does not meet City illumination standards, reducing pedestrian safety; embankment area is dark during day and night, and this contrast reduces the sense of safety and security for pedestrians

See Appendix B for a side-by-side comparison of existing conditions at each underpass.

EXISTING CONDITIONS: WEBSTER STREET UNDERPASS

WEBSTER STREET UNDERPASS FACING NORTH



WEBSTER STREET UNDERPASS FACING WEST



WEBSTER STREET UNDERPASS FACING SOUTH



VEGETATION

① Vines grow up fencing, adjacent mature trees

SIGNAGE + STRIPING

② No crosswalk striping or pedestrian traffic signals

FENCING

③ Chain-link, sharp and black metal fencing curved at top with sharp points

SIGNAGE

④ Large directional signage for Jack London district and Webster Street tube

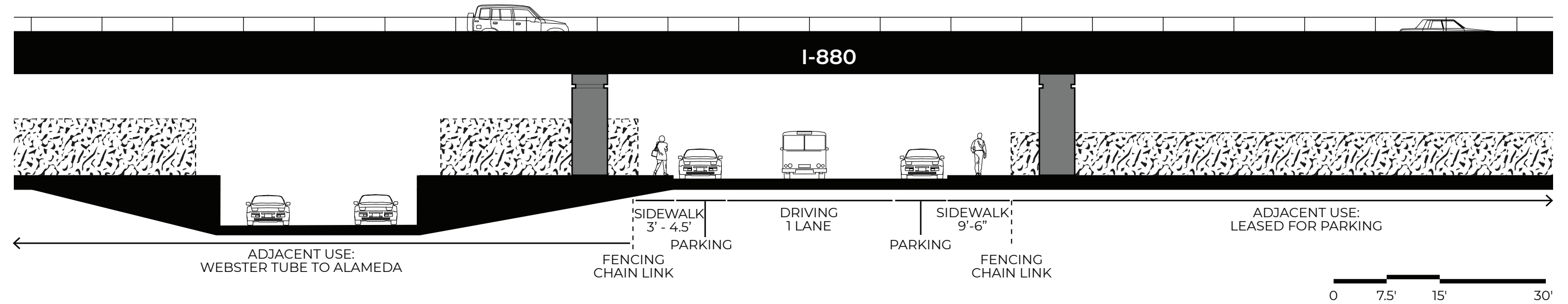
FREEWAY STRUCTURE

⑤ Adjacent Webster Street tube

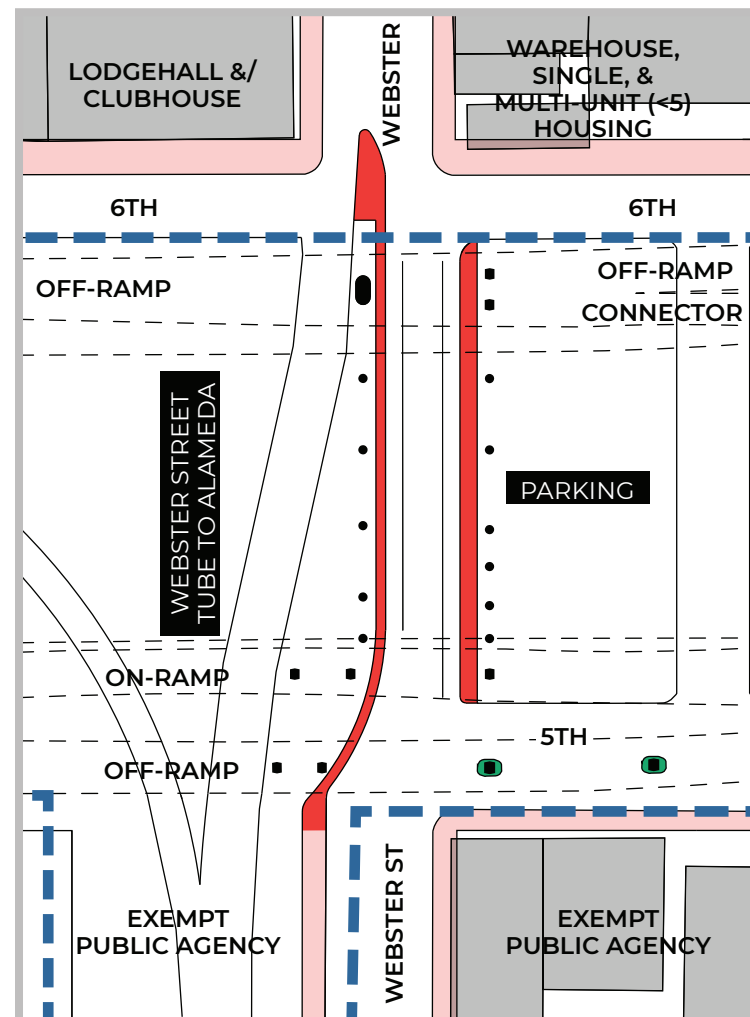
FREEWAY STRUCTURE

⑥ Significant depth due to number of overpassing structures

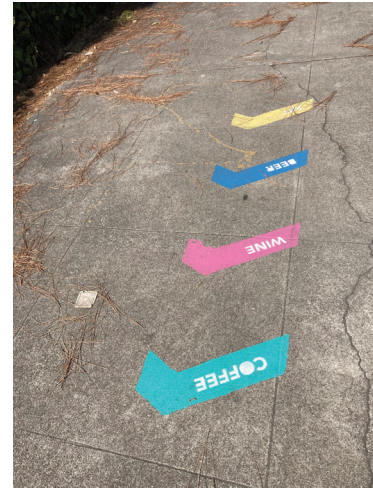
EXISTING CONDITIONS: WEBSTER STREET UNDERPASS



PLAN VIEW



EXISTING CONDITIONS: WEBSTER STREET UNDERPASS



UNDERPASS SIZE	14'7" to 14'10" high, 37'6" (secondary) + 149' (primary) + 26' (secondary) + 26'9" (secondary)
SIDEWALK SIZE	East: 9'6" / West: 4'6"
ADJACENT USES	East: Parking West: Vegetated, fenced median next to Alameda-bound Webster tube
FENCING	East: Chain-link fence (6'8"); two forms of barbed wire (coil, 3 rows) West: Metal fencing with sharp, bent "candy cane" tips (8'6")
VEGETATION	Median in between surface-level underpass and Webster tube, covering the grade change, covered with groundcover
SIGNAGE	Striping and/or signage is lacking at the northwestern sidewalk crossing of Webster Street, and southeast sidewalk crossing at 5th Street; neighborhood directional signage is in place for oncoming traffic
STRIPING	Striping at all intersections; pedestrian signals not installed at some intersections
ACOUSTICS	Day-night average sound level: On street - 75 dBA At underpass - 77 dBA Avg Leq (h) : On street - 70 dBA At underpass - 72 dBA
VISIBILITY	Large portions of the sidewalks do not meet City illumination standards, reducing pedestrian safety and security

See Appendix B for a side-by-side comparison of existing conditions at each underpass.

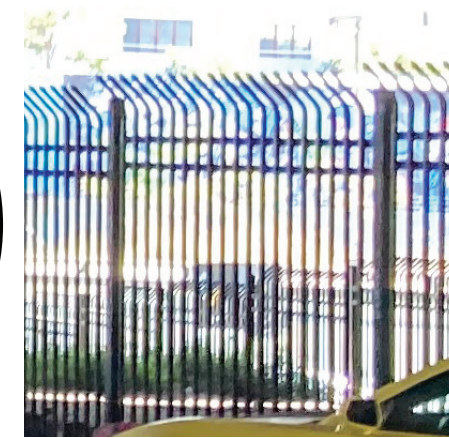
EXISTING PATTERNS IN STUDY AREA UNDERPASSES

Six key phenomena in the built environment that influence pedestrian sight, hearing, and sense of physical vulnerability

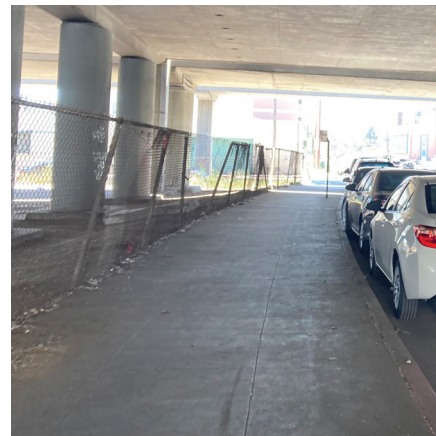
The lower and deeper the underpass, the longer the area will be in a darker period of daytime shadow



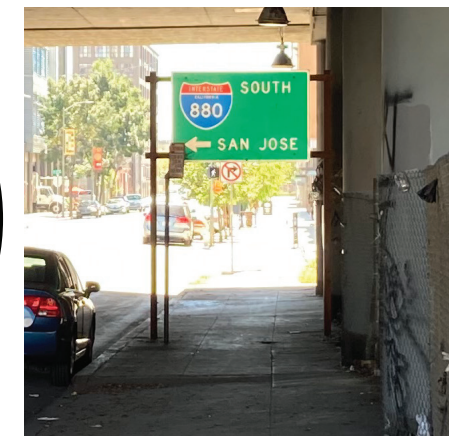
Hostile architecture: curved, pointed steel-top fencing; barbed and razor wire atop fencing



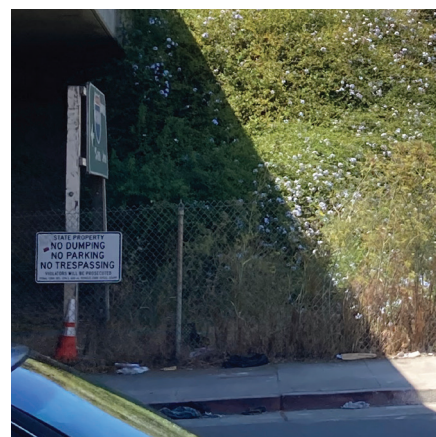
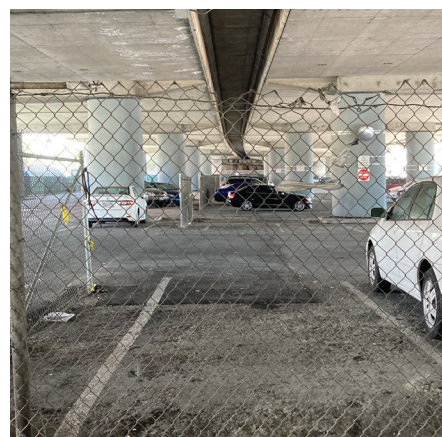
Sidewalks range from narrow, at 3', to ample, at 9'6" (OMC requires a minimum clear width of 5'6")



Signage is typically oriented to either pedestrians (restrictions) or vehicles (wayfinding)



Common adjacent uses: parking, embankments, encampments



Vegetation: Mature trees line the freeway, many embankments are planted, weeds flourish along fencelines



EXISTING PATTERNS: VISIBILITY & LIGHTING

Many underpasses do not provide adequate lighting by City standards

ISSUES	CAUSES	SOLUTIONS
Poor visibility of each other between drivers and pedestrians	The scale of vehicular-oriented transportation infrastructure, its large columns, embankments, vegetation, parked cars	Increase high-contrast signage and symbols to allow drivers and pedestrians to anticipate and see one another
Poor visibility upon approaching the underpass during daytime	Eyes adjusted to daylight cannot equally define forms in deep shade that lack additional illumination	Reduce contrast between daylight and underpasses by increasing light in underpass
Poor visibility within underpasses at night	Insufficient quality of lighting	Improve uniformity and quality of lighting



Typical existing LED luminaires



Example of high contrast in daytime conditions



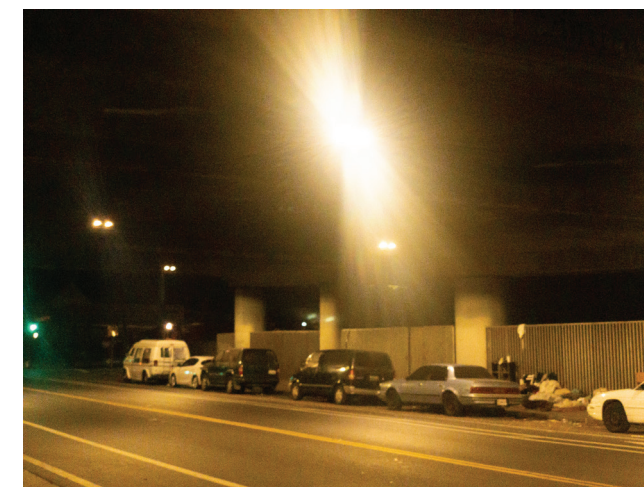
Example of poor vertical illumination



Example of dark embankment areas



Typical existing nighttime conditions



Example of glare caused by existing luminaires

EXISTING PATTERNS: ACOUSTICS

Acoustic levels exceed the threshold for sustained, easy communication

ISSUES	CAUSES	SOLUTIONS
Loud sound of freeway traffic contributes to stress	<p>Sound of freeway traffic overhead</p> <p>Sound of vehicles accelerating at on-ramps and decelerating at off-ramps next to underpass</p> <p>Sound of surface traffic beneath underpass reflected and echoing on underpass</p> <p>Sound of traffic reverberating at Webster Tube tunnel</p>	<p>Sound attenuation system along sides of freeway</p> <p>Sound absorbing elements below freeway, either on ceiling or vertical elements in relation to sidewalk</p>

Guidelines for Community Noise (World Health Organization)¹

"Sentences may be 100% intelligible **with a raised voice** in ambient noise environments up to 55 dBA; and **with a strained voice** in ambient noise environments up to 65 dBA.

For **vulnerable groups** (e.g., elderly, hearing impaired), lower ambient noise levels are often needed to achieve acceptable levels of speech intelligibility." Those who are blind or have low vision use sound for navigation clues.

Study Area Noise Measurements

The underpass study area noise measurements are 70 dBA - 78 dBA, and **commonly exceed 100 dBA** during high noise level vents (e.g. sirens, motorcycles).

¹ <https://www.who.int/docstore/peh/noise/Comnoise-1.pdf>

EXISTING PATTERNS: PHYSICAL VULNERABILITY

Elements in the built environment can impact a pedestrian's sense of physical vulnerability

ISSUES	CAUSES	SOLUTIONS
Fast moving cars intimidate pedestrians	Sound of cars overhead	Install wayfinding tools designed for pedestrians at underpass intersections
Drivers do not expect pedestrians to be present	Speed of cars overhead, at ramps and nearby roads	Install signage for off-ramps to alert about pedestrians
Drivers focus on navigation and on- and off-ramps	Wayfinding signs are oriented toward drivers, while pedestrian signs emphasize restrictions	Improve lighting hue and brightness for pedestrian comfort alongside driver and cyclist safety
Low visibility of other individuals in dim lighting	Visual language of neighborhoods is lacking near on- and off-ramps	Follow pedestrian standards for furnishings, especially fencing
Isolation due to minimal eyes on underpass and presence of pedestrians	Certain hues of light decrease visibility in underpasses	Widen sidewalks, particularly near intersections
Sense of hostility toward pedestrians	Poor connectivity to adjacent streets and sidewalks	Use adjacent airway space for public space and events
Lack of traffic safety	Sharp fencing and barbed wire	Add wayfinding signage not only at underpass, but in intersections leading up to it
	Narrow sidewalks, especially at intersections	
	People avoid underpasses for all reasons stated here	Improve maintenance of plants and refuse
	Poor maintenance of plants and waste	

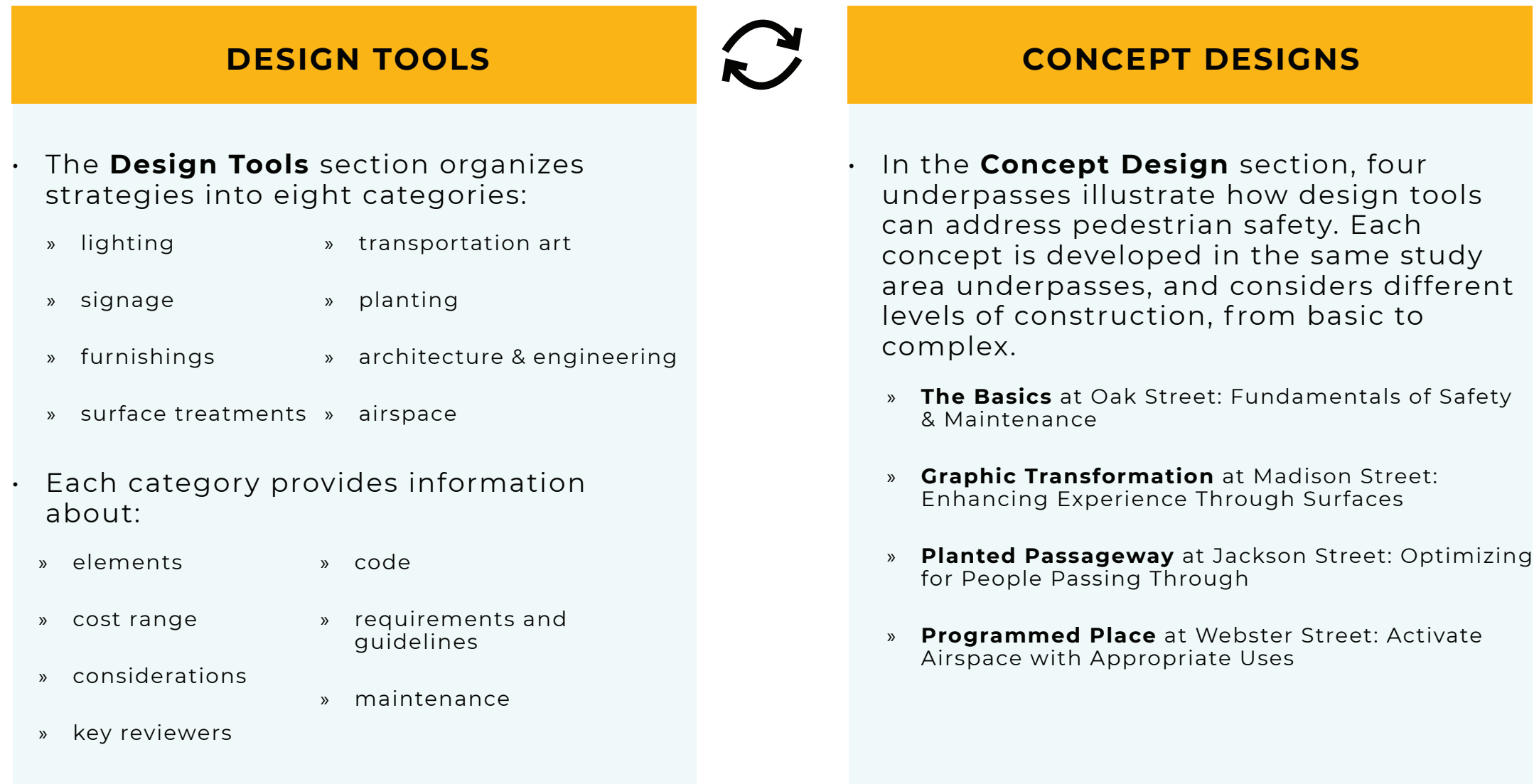
SECTION 4

Design Solutions

DESIGN SOLUTIONS

This section consists of two parts: Design Tools and Concept Designs. Ideas are described in detail, and then illustrated in four existing underpasses.

>> *Flip back and forth between the two parts to visualize and understand an approach for your underpass of interest.*



DESIGN TOOL 1: LIGHTING

- 1 Lighting
- 2 Signage
- 3 Furnishings
- 4 Surface Treatments
- 5 Transportation Art
- 6 Planting
- 7 Architecture+Engineering
- 8 Airspace



a. Daniel Galvez and Keith Sklar with Brooke Falcher, Karne Sjolholm, and community artists, Grand Performance, 1984, Grand Avenue underpass, Oakland, CA, 1984.
 b. Terremoto, Platform Park, 2019, Culver City, CA. (Image by Stephen Schauer)
 c. BART, Pilot Project, 2021, programmable LED lights, MacArthur BART Station-40th Street underpass, Oakland, CA. (Image: @SFBART, https://mobile.twitter.com/SFBART/status/1405683540117753856?cxt=HHwWgMCote3u_oEnAAAA)
 d. Todd Blair, Alex Ismerio, and John Rogers, with Sasaki Associates, Undercurrent, 2014, light and metal formwork, Lake Merritt Boulevard underpass, Oakland, CA. (Image by John Kirkmire, <https://www.lakemerritt.org/>)

Elements | Cost Range: \$100-500 \$\$500-1,500 \$\$\$1,200-5,000 each

- **Light Standards**, also known as a streetlight or lamppost, which illuminates roadways and sidewalks | \$\$\$
- **Wall Lights** downlight near sidewalks | \$
- **Ceiling Lights** downlight across the underpass | \$
- **Uplighting** illuminates from finish grade | \$\$
- **Illuminated site furnishings** > For example, bollards, rails, or bus stop benches | \$\$
- **Floodlights** downlight from pole-mounted structures independent from the freeway | \$\$\$
- **Artistic or Decorative Lighting** > For example, moving lights that project stenciled patterns; pole-mounted | \$\$

Considerations

- **Increase quantity or quality of lighting** where code does not appear adequate, especially daytime dark areas like embankments
- **Illuminate landscaped areas** in addition to pedestrian and roadway areas
- **Establish an artistic theme** by selecting unique forms or finishes, or installations such as projections
- **Integrate light fixture styles and/or wayfinding signage used in adjacent neighborhoods** which are typically light standards; they can also match nearby site furnishings
- The process for a **new PG&E electrical connection** can take almost a year; this process should begin early in a project's design

DESIGN TOOL 1: LIGHTING

- 1 Lighting
- 2 Signage
- 3 Furnishings
- 4 Surface Treatments
- 5 Transportation Art
- 6 Planting
- 7 Architecture+Engineering
- 8 Airspace



a. Light standard at MacArthur BART Station–40th Street underpass, Oakland, CA.
b. Light standard at 52nd Street underpass, Oakland, CA.
c. Susan Zuccola, "Grow" for East Campbell Avenue Portals Project, Campbell Avenue underpass, Campbell, CA. (Image: <https://susanzuccola.com/Grow>)

Key Reviewers

- Oakland Department of Transportation
- Caltrans

Codes, Requirements & Guidelines

- Refer to **City of Oakland Outdoor Lighting Standards**¹
- Refer to **City of Oakland Street Lighting Warrants**²
- Refer to **City of Oakland Street Light Design Manual**³
- Determine the location and orientation of **utility cabinets** for pedestrian lighting as to not impede desired pedestrian movement, ADA requirements, doorways, and line-of-sight needs
- **Meet minimum lighting safety standards**
- **Specify low-glare fixtures** to improve visual comfort and safety
- A **Caltrans Maintenance Agreement** is required for these improvements

Maintenance

- Routinely **powerwash** underpass ceiling, especially where traffic stalls, to reduce darkness
- Develop a **maintenance schedule** to routinely clean luminaires to ensure optimal light output
- Clean/repaint light posts if they are vandalized; use **anti-graffiti coatings** when available
- Routinely ensure all fixtures are **operational**
- Routinely ensure adjustable fixtures are **properly directed**

¹ <http://www2.oaklandnet.com/oakcal/groups/pwa/documents/policy/oak026007.pdf>

² <http://www2.oaklandnet.com/oakcal/groups/pwa/documents/policy/oak025394.pdf>

³ <http://www2.oaklandnet.com/oakcal/groups/pwa/documents/policy/oak044193.pdf>

DESIGN TOOL 2: SIGNAGE

Signage communicates to pedestrians and drivers, and provides wayfinding for neighborhoods and sites

- 1 Lighting
- 2 Signage
- 3 Furnishings
- 4 Surface Treatments
- 5 Transportation Art
- 6 Planting
- 7 Architecture+Engineering
- 8 Airspace



Elements | Cost Range: \$100-500 \$\$500-1,500 \$\$\$1,500-35,000 each

- **Post-mounted banners or metal signs** attached to street sign posts, traffic signal posts, or light standards | \$ - \$\$
- **Gateway or monumental signage:** freestanding sculptural wayfinding elements on either side of underpass | \$\$\$

Considerations

- **Incorporate surrounding neighborhood signage standards** for sign aesthetics
- **Extend wayfinding signage** from underpass to adjacent intersections and streets if not already present
- Use **high-contrast or bright colors** for enhanced visibility
- **Coordinate with vehicular signage;** a comprehensive wayfinding approach should benefit multi-modal transit

a. Jack London District banner, Oakland, CA.
b. Chinatown street sign, Oakland, CA.
c. Oakland Waterfront Warehouse District sign, Oakland, CA.

DESIGN TOOL 2: SIGNAGE



a. Jack London District banner, Oakland, CA.

- 1 Lighting
- 2 Signage
- 3 Furnishings
- 4 Surface Treatments
- 5 Transportation Art
- 6 Planting
- 7 Architecture+Engineering
- 8 Airspace

Key Reviewers

- Oakland Department of Transportation
- Caltrans
- Economic & Workforce Development Department (EWDD) Cultural Affairs Division and Public Art Advisory Committee (PAAC) are required for Transportation Art

Codes, Requirements & Guidelines

- Identify adjacent Business Improvement, Historic, or other types of Districts with **existing signage standards**
- Following Caltrans terminology, integrate signage into "**Community Identification,**" "**Gateway Monuments,**" or "**Transportation Art**" > See *Transportation Art Design Tool* (pages 51-52)
- A **Caltrans Maintenance Agreement** is required for these improvements

Maintenance

- Regularly **clean signage** to keep it legible and clear of exhaust particulate build-up or graffiti
- Use an **anti-graffiti coating** on signage material where available

DESIGN TOOL 3: FURNISHINGS

Furnishings invite pedestrians into the underpass; high contrast, color, and light bring drivers' attention to pedestrian spaces

- 1 Lighting
- 2 Signage
- 3 **Furnishings**
- 4 Surface Treatments
- 5 Transportation Art
- 6 Planting
- 7 Architecture+Engineering
- 8 Airspace



Elements | Cost Range: \$20-100 \$\$100-1,000 \$\$\$1,000-2,500 each
Linear Foot (LF)

- **Bollards and raised planters** separate different uses | \$\$
- **Existing fencing treatments**
> *Examples:* privacy slats, custom vinyl screening, or ribbon | \$LF
- **New or replacement fencing** separate different uses | \$\$LF
- **Hygienic facilities**, including dumpster and waste receptacles, portable toilets, and portable handwashing stations; the City is adding Portland Loos¹ | \$\$ - \$\$\$

Considerations

- Remove all **barbed and razor wire** to reduce sense of hostility toward pedestrians
- Select furnishing elements with complementary, **high-contrast or bright colors** for enhanced visibility and **cohesive graphic identity**
- Incorporate adjacent **neighborhood furnishing standards**
- For barriers between uses or areas, **use alternatives to fencing**, such as raised planters or bollards
- Where fencing must be used, **relocate fencing behind columns** and integrate columns and/or tree planting along freeway into overall design
- **Incorporate temporary hygienic facilities** into broader graphic identity
- Add a **mosaic trashcan**; see *Section 5: Public Art Processes* for more information on this Adopt-A-Spot program

¹ <https://portlandloo.com/>

a-b. LA Más, Go Ave 26, 2017, underpass and streetscape temporary installation, Avenue 26, Los Angeles, CA. (Image: <https://www.mas.la/go-ave-26>)
c. Armal, 2018. (Image: <https://www.armal.biz/news/new-color-range-portable-restrooms-have-never-been-this-pop>)

DESIGN TOOL 3: FURNISHINGS

- 1 Lighting
- 2 Signage
- 3 Furnishings
- 4 Surface Treatments
- 5 Transportation Art
- 6 Planting
- 7 Architecture+Engineering
- 8 Airspace



a. Landscapeforms, Connect 2.0. (Image: <https://www.landscapeforms.com/en-us/product/pages/Connect-2-0-Shelter.aspx>)
b. Forms+Surfaces, Light Column Bollard. (Image: <https://www.forms-surfaces.com/light-column-bollard>)

Key Reviewers

- Oakland Department of Transportation
- Oakland Department of Public Works
- Caltrans
- For artwork that functions as furnishings, EWDD's Cultural Affairs Division and the PAAC

Codes, Requirements & Guidelines

- Many traffic signal controller cabinets and trash receptacles on Oakland's sidewalks become works of art through the City's **Adopt a Spot**¹ program. Mosaic trash cans are administered through Adopt-A-Spot, and original artwork on City-owned controller cabinets is reviewed and approved by the Public Art Program staff and PAAC, permitted by OakDOT.
- A **Caltrans Maintenance Agreement** is required for these improvements
- **ADA requirements** and recommendations (see page 14)

Maintenance

- Regularly **clean furnishings** to keep them legible and clear of exhaust particulate build-up or graffiti
- Select **anti-graffiti finishes** for furnishings
- **Trash Receptacles** > Oakland has identified approved trash receptacle models. Public Works' Keep Oakland Clean & Beautiful Division must review and approve new trash receptacle locations so the new locations can be placed on their map for service. Place trash receptacles in the furniture zone and ensure each receptacle is accessible by garbage trucks from the street.
- Consider **offensive odors and garbage/waste** when implementing maintenance plans and schedules

¹ <https://www.oaklandca.gov/services/apply-for-adopt-a-spot-online>

DESIGN TOOL 4: SURFACE TREATMENTS

Temporary or permanent surface treatments create pedestrian-oriented wayfinding and spaces

- 1 Lighting
- 2 Signage
- 3 Furnishings
- 4 Surface Treatments
- 5 Transportation Art
- 6 Planting
- 7 Architecture+Engineering
- 8 Airspace



a. Richmond Boulevard underpass, Oakland, CA.
 b. Sidewalk wayfinding program, Jack London District, Oakland, CA.
 c. Alan Leon, Temescal Flows, 2011-2012, 2015, mural, 52nd Street/Highway 24 overpass and support columns, Oakland, CA.
 d-e. LA Más, Go Ave 26, 2017, underpass and streetscape temporary installation, Avenue 26, Los Angeles, CA. (Image: <https://www.mas.la/go-ave-26>)

Elements | Cost Range: \$10-20 \$\$20-35 \$\$\$50-100
 per square foot

- **Non-vegetative groundcovers** > *Examples:* Mulch, soil, ballast, or crushed stone to reduce noise | \$
- **Reflective Paint** Apply to underpass structures including ceiling, walls, and columns to increase visibility | \$
- **Anti-slip paint** Use grit add-in to paint for walking surfaces (sidewalk, asphalt road, crosswalks) | \$
- **Tile** Apply to underpass walls or columns | \$\$
- **Mounted Surfaces** on existing fencing to provide sound attenuation (heavier materials are better) >*Examples:* Vinyl banners, acrylic panel, plywood | \$\$\$

Considerations

- Select surface treatments with complementary, **high-contrast, light, or bright colors and finishes** for enhanced visibility and **cohesive graphic identity**
- Integrate **wayfinding** into graphic surface treatments
- Integrate **decorative, high-contrast patterns** into graphic surface treatments, such as crosswalk, pedestrian scramble, or roadway patterns
- **Extend into neighboring streets** wayfinding, patterns, and colors in underpass improvements
- **Identify existing materials, colors, and patterns** and use them in underpass design, or select complementary elements
- Original public art and community murals must follow the **Caltrans Transportation Art Process**, see page 51

DESIGN TOOL 4: SURFACE TREATMENTS

- 1 Lighting
- 2 Signage
- 3 Furnishings
- 4 Surface Treatments
- 5 Transportation Art
- 6 Planting
- 7 Architecture+Engineering
- 8 Airspace



a. LA Más, Go Ave 26, 2017, underpass and streetscape temporary installation, Avenue 26, Los Angeles, CA. (Image: <https://www.mas.la/go-ave-26>)
b. Pedestrian Scramble, 8th Street and Webster Street, Oakland, CA. (Image: <https://511contracosta.org/all-about-crosswalks/>)

Considerations Cont.

- Incorporate visual impairment aids such as **detectable warnings**,¹ 2- to 3-foot buffers of surface treatment such as described in the San Francisco Bay Train Design Guidelines and Toolkit²
- Prioritize supporting **people with limited sight** so any ground surface treatment does not hinder their navigation
 - » Keep painted surfaces out of "through" pedestrian areas like sidewalks and street crossings
 - » Use single background colors; avoid black or white
 - » Use pavement patterns with regularized shapes that are not confused with curbs or wayfinding symbols
 - » Avoid the following, which can be confusing and dangerous for people with low vision: line striping, abstract patterns, repeating patterns and intertwined shapes, and black or white lines or shapes (which can be perceived as dips or humps)
 - » Single colors or large blocks of solid colors, rather than patterns, are easiest for people with low vision to navigate; a solid background color with mosaic patterns inside can also work
 - » Borders and edges of graphic patterned surface treatments can prevent people with low vision from using them as a navigation element

¹ <https://www.access-board.gov/prowag/other/dw-update.html>

² https://baytrail.org/pdfs/BayTrailDGTK_082616_Web.pdf

DESIGN TOOL 4: SURFACE TREATMENTS



a. LA Más, Go Ave 26, 2017, underpass and streetscape temporary installation, Avenue 26, Los Angeles, CA. (Image: <https://www.mas.la/go-ave-26>)

- 1 Lighting
- 2 Signage
- 3 Furnishings
- 4 Surface Treatments
- 5 Transportation Art
- 6 Planting
- 7 Architecture+Engineering
- 8 Airspace

Key Reviewers

- Oakland Department of Transportation
- Oakland Department of Public Works
- Caltrans

Codes, Requirements & Guidelines

- If a crosswalk is augmented with decorative painting, the paint must have **grit add-in** to prevent slipping
- **California Manual on Uniform Traffic Control Devices Section 3G.01¹**
 - > > Decorative markings on colored pavement must contrast with the visibility of the crosswalk markings and must be devoid of retroreflective properties. See section 3G.01 for additional guidance.
- A **Caltrans Maintenance Agreement** is required for these improvements
- Refer to OakDOT's **Paint the Town Program**,² which encourages temporary street murals

Maintenance

- Routinely **powerwash surfaces**, like columns and ceilings, to remove accumulated particulate matter

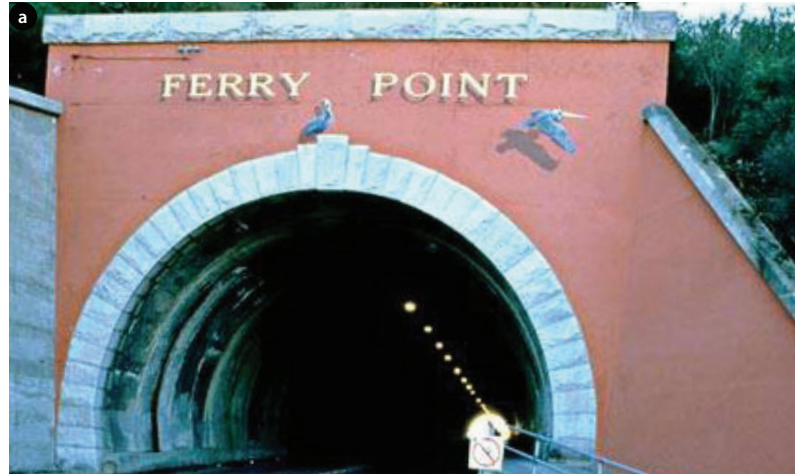
¹ <https://dot.ca.gov/programs/safety-programs/camutcd>

² <https://www.oaklandca.gov/projects/paint-the-town>

DESIGN TOOL 5: TRANSPORTATION ART

Public art brings placemaking to underpasses

- 1 Lighting
- 2 Signage
- 3 Furnishings
- 4 Surface Treatments
- 5 Transportation Art
- 6 Planting
- 7 Architecture+Engineering
- 8 Airspace



a. John Wehrle, Ferry Point, 1996, mural, Tunnel Avenue, Richmond, CA.
b. Alan Leon, Temescal Flows, 2011-2012, 2015, mural, 52nd Street/Highway 24 overpass and support columns, Oakland, CA.
c. Underpass gateway, Niles Boulevard underpass, Fremont, CA.

Elements | Cost Range: \$20,000-40,000 \$\$40,000-100,000 \$\$\$100,000-300,000 each

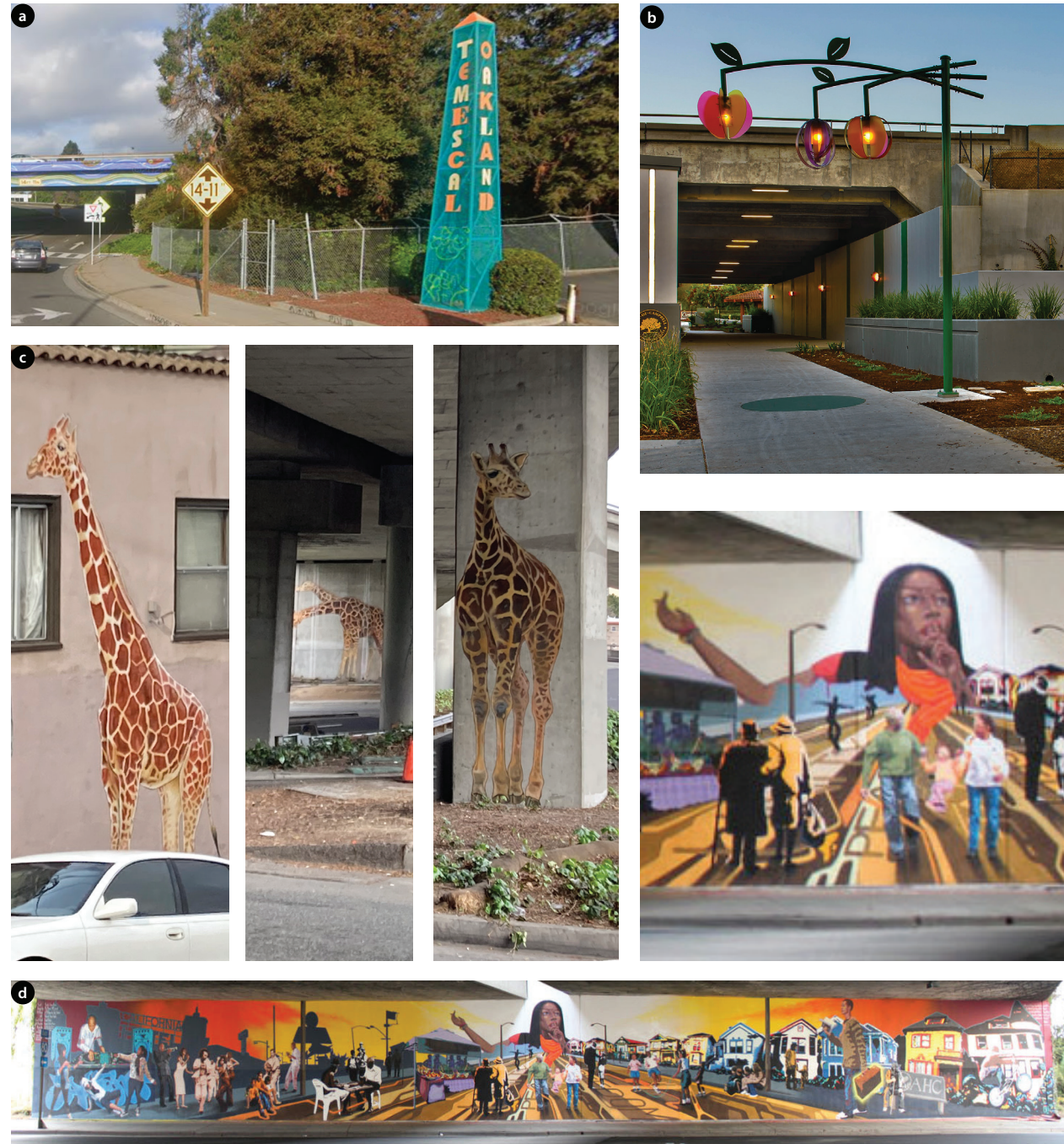
- **Transportation Art** includes graphic or sculptural artwork, freestanding or placed upon a required engineered transportation feature (ex. noise barrier, slope paving, bridge), and expresses unique attributes of a community's history, resources, or character | \$\$
- **Community Identification** includes graphics and/or text about a region, community, or area | \$
- **Gateway Monuments** are freestanding structures or signs not integral to or required by the freeway; they are located in the State right-of-way, and communicate the name of the city or county | \$\$\$
- See **Section 5 Public Art Processes** for more options

Considerations

- Establish a **mural program**, temporary or permanent, on walls or columns
- Hire a local cultural or public art consultant
- If the proposal has multiple artwork pieces on a Caltrans property, a new permit/review is required for each piece
- Consider avoiding **art mounted to freeway structures**; otherwise, follow the extensive Caltrans review process to ensure it is easily removable and meets specific maintenance and safety needs
- Art that simultaneously **facilitates pedestrian safety** and improves safety by meeting light safety standards will be more amenable to Caltrans review processes

DESIGN TOOL 5: TRANSPORTATION ART

- 1 Lighting
- 2 Signage
- 3 Furnishings
- 4 Surface Treatments
- 5 Transportation Art
- 6 Planting
- 7 Architecture+Engineering
- 8 Airspace



a. Ellen Kim, Temescal Obelisk, metal obelisk, near 52nd Street underpass, Oakland, CA.
 b. Susan Zuccola, "Grow" for East Campbell Avenue Portals Project, Campbell Avenue underpass, Campbell, CA. (Image: <https://susanzuccola.com/Grow>)
 c. Dan Fontes, Giraphics, 1984, multiple locations, including Harrison Street and Oakland Avenue underpasses, Oakland, CA.
 d. Attitudinal Healing Connection, with McClymonds High School, Oakland Super Heroes Mural #1, Oakland Super Heroes Mural Project, San Pablo Avenue, Oakland, CA. (Image: <https://www.ahc-oakland.org/oakland-mural-project-1>)

Considerations Cont.

- Research **local artists** from nearby neighborhoods, or involve local organizations for guidance
- Consider the **content**; is it abstract, or specific to Oakland landmarks or cultural aspects of the neighborhood?

Key Reviewers

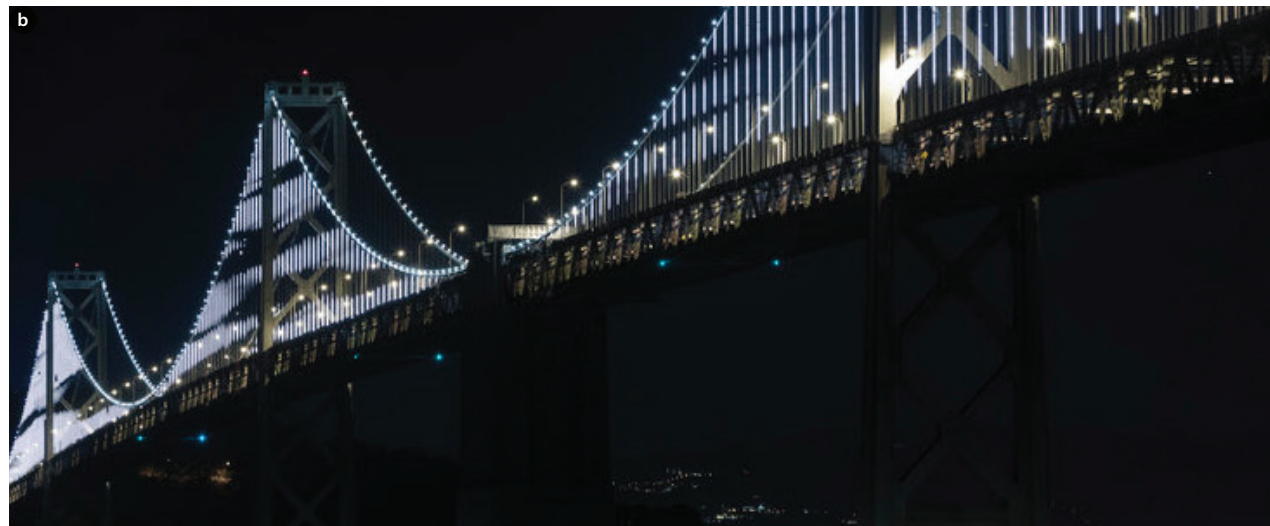
- Oakland Department of Transportation
- Oakland Public Art Advisory Committee
- Caltrans

Pilot Projects

- The next page shows two **Caltrans Pilot Transportation Art projects**; "pilot" projects result from proposals either not currently allowed or clearly defined under current Transportation Art guidance and policies
- The applicant must demonstrate the proposal will not be a potential distraction or hazard to the public, and will not hinder Caltrans' ability to perform required structural investigations and inspections
- Like all Transportation Art projects, pilot projects are required to undergo Design Engineering Evaluation Report (DEER) review (See **Section 5**) and to receive approval from all functional stakeholders
- Implemented pilot projects do not guarantee future Caltrans approval decisions; policies about acceptable art installations on structures are periodically updated

DESIGN TOOL 5: TRANSPORTATION ART

- 1 Lighting
- 2 Signage
- 3 Furnishings
- 4 Surface Treatments
- 5 Transportation Art
- 6 Planting
- 7 Architecture+Engineering
- 8 Airspace



a. Dan Corson, Sensing YOU, 2015, paint, acrylic, LEDs, steel, sensors, control, cell phone interface, Santa Clara Street underpass, San Jose, CA. (Image: <http://dancorson.com/sensing-you>)
b. Leo Villareal, The Bay Lights, LED, Willie L. Brown Jr. Bridge, San Francisco, CA. (Image: <http://villareal.net/the-bay-lights-san-francisco-bay-bridge-2013/zzd6lw3kqotaz2i06ihyy0ilrg8mq8>)

¹ <https://www.oaklandca.gov/topics/public-art-in-oakland>

² https://dot.ca.gov/-/media/dot-media/programs/design/documents/hq_transportation-art-_proposal_01_21_2020_003.pdf

³ <https://dot.ca.gov/programs/design/manual-project-development-procedures-manual-pdpm>

Codes, Requirements & Guidelines

- Follow the required **City of Oakland Public Art Advisory Committee** process¹
- Caltrans provides guidance for their Transportation Art Program, including the **Transportation Art Proposal (Application)**²
- Caltrans' **Transportation Art, Community Identification, and Gateway Monument** policies are described in the **Caltrans Project Development Procedures Manual³ (PDPM)**, Chapter 29, Landscape Architecture
- Be alert that **Caltrans' Transportation Art is copywritten**; copywritten art follows an extensive Caltrans review process. Artists should note that, as detailed in the PDPM Chapter 29 section on Transportation Art, art within the Caltrans' right-of-way becomes State property and requires an executed assignment and transfer agreement from the artist to Caltrans
- A **Caltrans Maintenance Agreement** is required for these improvements, and requires the City to be the holder of the agreement; the City requires City Council resolution

Maintenance

- Consider the **on-going and longterm maintenance** required of the art during its development, and identify a budget for its maintenance
- The City requires specific maintenance commitments for **temporary versus permanent artworks**
- The developer often identifies a **maintenance contractor** for public art

DESIGN TOOL 6: PLANTING

Plantings and movable planters bring a neighborhood scale to infrastructure, and define space for different uses



a. Terremoto, Platform Park, 2019, Culver City, CA. (Image by Stephen Schauer)
b. Richmond Boulevard underpass, Oakland, CA.
c. Susan Zuccola, "Grow" for East Campbell Avenue Portals Project, Campbell Avenue underpass, Campbell, CA. (Image: <https://susanzuccola.com/Grow>)

Elements | Cost Range: \$10-35 \$\$35-150 \$\$\$150-500
per square foot

- **In-ground planting** at grade along the sidewalk or embankment | \$
- Cast-in-place concrete **raised beds** where space allows | \$\$
- **Prefabricated raised beds** along the sidewalk or foot of embankments | \$\$
- **Stormwater planting elements**, including stormwater planters, stormwater curb extensions, rain gardens, street trees, and understory planting | \$\$\$

Considerations

- Moveable raised planters are not allowed within Caltrans right of way; planters must be **secured** to the sidewalk
- As an **alternative to monoculture plantings**, which are common along freeways, consider a diverse plant palette typical to identifying pedestrian space
- Use planting to **define different spaces** > examples: sidewalks, bike lanes, roadways, embankments, encampments
- Integrate **common planting considerations**: Identify water source, anticipate and create irrigation and maintenance plans; use drought-tolerant, low-maintenance, and durable plants resilient to foot traffic
- Consider **underpass-specific conditions**: Deep shade, partial shade, and/or no rainfall directly watering plants, lack of nearby water source
- Use **stormwater-tolerant** plants where appropriate

- 1 Lighting
- 2 Signage
- 3 Furnishings
- 4 Surface Treatments
- 5 Transportation Art
- 6 **Planting**
- 7 Architecture+Engineering
- 8 Airspace

DESIGN TOOL 6: PLANTING

- 1 Lighting
- 2 Signage
- 3 Furnishings
- 4 Surface Treatments
- 5 Transportation Art
- 6 **Planting**
- 7 Architecture+Engineering
- 8 Airspace



a. Hood Design Studio, Splashpad Park, 2003, Oakland, CA.
b. Streetlife, tree planters. (Image: <https://www.streetlife.nl/us/tree-planters>)

Key Reviewers

- Oakland Department of Transportation
- Oakland Public Works
- Caltrans
- East Bay Municipal Utility District (EBMUD)

Codes, Requirements & Guidelines

- Caltrans' **Highway Planting** policy is described in the **Caltrans Project Development Procedures Manual¹ (PDPM)**, Chapter 29, Landscape Architecture, and highlights the responsibilities of Caltrans and local government agencies
- **C.3 Stormwater Technical Guidance²** - Appendix B: Plant List and Planting Guidance
- **City of Oakland Green Stormwater Infrastructure Plan³** (2019)
- A **Caltrans Maintenance Agreement** is required for these improvements
- **ADA requirements** and recommendations (see page 14)
- Make sure to maintain a **straight, continuous path**; OMC requires a minimum 5'6" width

Maintenance

- **Maintain vegetation and accumulated waste** in planting areas
- **Prune vegetation** growing on fencing near intersections to maintain pedestrian and multi-modal visibility

¹ <https://dot.ca.gov/programs/design/manual-project-development-procedures-manual-pdpm>

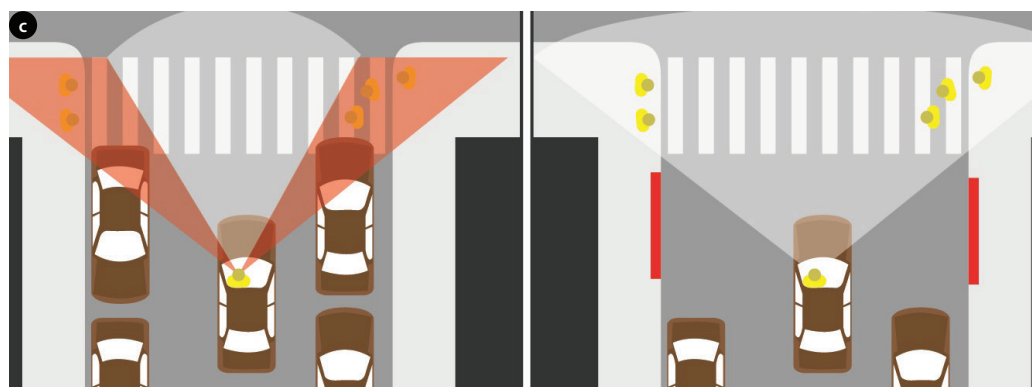
² https://www.cleanwaterprogram.org/images/uploads/C3_Technical_Guidance_v6_Oct_2017_FINAL_Errata_updated_04.20.18.pdf

³ https://cao-94612.s3.amazonaws.com/documents/Oakland-GSI-Plan-Final-20190930_sm.pdf

DESIGN TOOL 7: ARCHITECTURE + ENGINEERING

Underpass walls and embankments can integrate materials and forms to create pedestrian-oriented space

- 1 Lighting
- 2 Signage
- 3 Furnishings
- 4 Surface Treatments
- 5 Transportation Art
- 6 Planting
- 7 Architecture+Engineering
- 8 Airspace



a. Susan Zuccola, "Grow" for East Campbell Avenue Portals Project, Campbell Avenue underpass, Campbell, CA. (Image: <https://susanzuccola.com/Grow>)
b. Creative Form Liners, concrete wall form liners. (Image: <https://www.creativeformliners.com/concrete-wall-form-liners/>)
c. SFMTA, intersection daylighting diagrams. (Image: <https://www.sfmta.com/blog/daylighting-makes-san-francisco-crosswalks-safer>)

Elements | Cost Range: \$15-35 \$\$35-250 \$\$\$250-500 per square foot

- **Stormwater-friendly hardscape elements**, including pervious, permeable, and porous pavement and pavers | \$
- **Parking, Separated Class IV bikeways, and planting areas** | \$
- **Multi-modal safety standards** (such as parking daylighting, wide sidewalks, speed bumps, bump-outs, flashing bollards, accessible pedestrian crosswalk signals) | \$\$
- **Embankments** in hardscape or softscape surfacing and grading | \$\$
- **All-weather metal cladding** (steel, corten) panels (such as cladding used on sides of buildings, parking garages, utility infrastructure screening) on sides of freeway | \$\$\$
- **Sound attenuation elements** such as fully enclosed walls or continuous solid barriers | \$\$\$

Considerations

- **Buffer** between traffic and sidewalk, using elements listed above
- Use **decorative treatments, finishes, and mixes** such as integral color, exposed aggregate, stone, concrete scoring or formliner, pavers for the roadway, sidewalks, embankments, columns, and walls
- Modify or remove non-structural underpass walls to **widen pedestrian space**
- Articulate embankments as **planted or hardscape terraces** or other smaller-scale forms
- Consider incorporating public art

DESIGN TOOL 7: ARCHITECTURE + ENGINEERING



- 1 Lighting
- 2 Signage
- 3 Furnishings
- 4 Surface Treatments
- 5 Transportation Art
- 6 Planting
- 7 Architecture+Engineering
- 8 Airspace

a. Bike East Bay, Connect Telegraph Avenue, Oakland, CA. (Image: <https://bikeeastbay.org/campaigns/telegraph>)
b. Oakland Wiki, "photo (46)" on Crosswalks, crosswalk at Fruitvale and Pleasant, Oakland, CA. (photo by greenkozi, [https://localwiki.org/oakland/Crosswalks/_files/photo%20\(46\).JPG/_info/](https://localwiki.org/oakland/Crosswalks/_files/photo%20(46).JPG/_info/))

Key Reviewers

- Oakland Department of Transportation
- Oakland Public Works
- Caltrans
- East Bay Municipal Utility District (EBMUD)

Codes, Requirements & Guidelines

- Oakland Municipal Code¹
- OakDOT Design Details for Transportation Facilities²
- City of Oakland Green Stormwater Infrastructure Plan³ (2019)
- OakDOT Crash Prevention Street Design Toolkit⁴
- OakDOT Three-Year Paving Plan⁵
- OakDOT Bicycle Plan⁶
- OakDOT Pedestrian Program⁷
- Caltrans Design Standards⁸
- A **Caltrans Maintenance Agreement** is required for these improvements

Maintenance

- Hardscape materials should be **durable**; using standard colors and materials supports **easier replacement**

¹ https://library.municode.com/ca/oakland/codes/code_of_ordinances?nodeId=OAKLANDMUCO

² <https://www.oaklandca.gov/resources/oakdot-design-details>

³ https://cao-94612.s3.amazonaws.com/documents/Oakland-GSI-Plan-Final-20190930_sm.pdf

⁴ <https://cao-94612.s3.amazonaws.com/documents/CMF-toolkit-PUBLIC.pdf>

⁵ <https://www.oaklandca.gov/resources/2019-paving-plan>

⁶ <https://www.oaklandca.gov/resources/bicycle-plan>

⁷ <https://www.oaklandca.gov/topics/pedestrian-services>

⁸ <https://dot.ca.gov/programs/design>

DESIGN TOOL 8: AIRSPACE

Improvements in airspace and land running parallel to the freeway impact pedestrians below and can improve safety

- 1 Lighting
- 2 Signage
- 3 Furnishings
- 4 Surface Treatments
- 5 Transportation Art
- 6 Planting
- 7 Architecture+Engineering
- 8 Airspace



a-b. Betsy Davids and John Wehrle, Mak Roote, 2006, mural and installation, Berkeley Transit Plaza, Berkeley, CA. (Image: <http://troutinhand.com/public-space/mak-roote/>)

Elements

- **Design Tools 1 - 7** > Examples include, but are not limited to: lighting, mural programs, fencing, planting

Considerations

- Identify opportunities to bring the elements and principles described in Design Tools 1 through 7 into the airspace to develop a space that is **holistically welcoming to and safe for pedestrians**
- **Move fencing inward into airspace**, away from the columns, sidewalk, and tree lawn, to broaden pedestrian and publicly accessible space and make the full height of the trees visible to the neighborhood
- Explore **programming** options relevant to the neighboring context

Key Reviewers

- Oakland Department of Transportation
- Oakland Public Works
- Caltrans
- East Bay Municipal Utility District (EBMUD)

DESIGN TOOL 8: AIRSPACE

Improvements in airspace and land running parallel to the freeway impact pedestrians below and can improve safety

- 1 Lighting
- 2 Signage
- 3 Furnishings
- 4 Surface Treatments
- 5 Transportation Art
- 6 Planting
- 7 Architecture+Engineering
- 8 Airspace



a-b. Hardy Park and Dog Park, Hudson Street underpass, Oakland, CA. (Image: <https://www.google.com/maps/@37.8423964,-122.2579476,3a,75y,98.51h,87.5t/data=!3m6!1e1!3m4!1sOpK9aXSVC-DWD4iIVpZQHO!2e0!7i16384!8i8192>)

Codes, Requirements & Guidelines

- Caltrans Airspace and Telecommunications Licensing; Procedure for Leasing Airspace to Public Entities - Resolution G-19-43¹
- A **Caltrans Maintenance Agreement** is required for these improvements
- The Caltrans **right-of-way unit** will need to be involved for use of leased airspace
- Right-of-way certification may expand the time line or require earlier right-of-way involvement, especially if private property purchases are required, including permanent and/or temporary easements and public or private utility involvement or relocations; budget 18-24 months for right-of-way certification

Maintenance

- Neighboring airspace must undergo **routine maintenance for waste and vegetation**

¹ <https://dot.ca.gov/-/media/dot-media/programs/right-of-way/documents/rps/resolution-g-19-43-ally.pdf>

CONCEPT DESIGNS

THE BASICS

FUNDAMENTALS OF SAFETY AND MAINTENANCE



GRAPHIC TRANSFORMATION

ENHANCING EXPERIENCE THROUGH SURFACES



PLANTED PASSAGEWAY

OPTIMIZING FOR PEOPLE PASSING THROUGH



PROGRAMMED PLACE

ACTIVATE AIRSPACE WITH APPROPRIATE USES



THE BASICS: SHOWN AT OAK STREET UNDERPASS



THE BASICS FUNDAMENTALS OF SAFETY AND MAINTENANCE

Addressing basic safety and maintenance issues can go a long way to improve the perception of safety and comfort for pedestrians and bicyclists using underpasses. For instance, recognizing an underpass as pigeon habitat can lead to regularly cleaning their droppings. These tools can and should be implemented as part of any underpass improvement. They can also be effective stand-alone improvements when funding is limited or when the regulatory process is prohibitively cumbersome. While the resulting improvements are more modest than other more comprehensive design solutions, the ease of implementation, low cost, and wide applicability of these tools make them valuable strategies.

EXISTING ISSUES

- ① Broken fencing allows access and creates safety issues
- ② Chain-link fence ineffective in controlling access, collects trash and weeds
- ③ Insufficient services for unhoused people to reduce negative impacts on space
- ④ Trash and dumping infringe on pedestrian space
- ⑤ Bare soil and weedy vegetation on embankment
- ⑥ Bird droppings on column, fencing, and ground
- ⑦ Car exhaust darkens roof reducing visibility
- ⑧ Lack of pedestrian-oriented lighting
- ⑨ Litter on sidewalk and in gutter

THE BASICS: SHOWN AT OAK STREET UNDERPASS



LIGHTING

- ① Provide basic pedestrian lighting and bird spikes on columns
- ② Regularly powerwash ceiling to keep clean and brighten underpass

SIGNAGE

- ③ Add pedestrian wayfinding signage

FURNISHINGS

- ④ Repair and repaint damaged fencing
- ⑤ Where fencing does not control freeway access, replace with planters to delineate pedestrian space
- ⑥ Provide portable restrooms for unhoused people
- ⑦ Provide dumpsters for unhoused people

SURFACE

- ⑧ Regularly clean sidewalk and gutter, and remove litter
- ⑨ Paint bike lane to increase visibility in low-light conditions
Note: Oakland's Bicycle Plan proposes protected bike lanes here. Buffered bike lanes shown to illustrate "The Basics" approach.

PLANTING

- ⑩ Provide mulch on bare soil of embankment for sound attenuation

AIRSPACE

- ⑪ Support existing airspace uses that contribute to community oversight and maintenance of the underpass, such as the Oak Street Cabins temporary housing program, and well-used parking lots at this location

GRAPHIC TRANSFORMATION: SHOWN AT JACKSON ST UNDERPASS



GRAPHIC TRANSFORMATION ENHANCING EXPERIENCE THROUGH SURFACES

A unified graphic treatment of underpass surfaces can transform an underpass from an undistinguished space into a local landmark. Without major changes to architecture or infrastructure, this graphic approach leverages an engaging design and a unified graphic palette to reshape the pedestrian experience. An added benefit of this approach is the opportunity to engage communities about the graphic identity of their underpass, and to partner with artists in generating graphics. Lighting can further enhance the ambiance of the space both day and night, and can create character by projecting onto surfaces that cannot be permanently painted.

EXISTING ISSUES

- ① Barbed wire on top of chainlink fence
- ② Underutilized and under maintained adjacent use
- ③ Litter accumulates at base of fence
- ④ Narrow and obstructed sidewalk
- ⑤ High glare, vehicle oriented lighting
- ⑥ Car dominated roadbed without bicycle infrastructure

GRAPHIC TRANSFORMATION: SHOWN AT JACKSON ST UNDERPASS



LIGHTING

① Pole mounted lighting illuminates pedestrian space, lights murals at night, and projects onto overpass "ceiling" at night

SIGNAGE

② Use graphics for wayfinding, painted on ground and columns

SURFACE

③ Keep main path of pedestrian travel standard grey concrete to reduce barriers for the blind and visually impaired. Graphics in the path of travel may look like obstacles. For more information see page 14 for more resources.

④ Affix vinyl banner to fence

⑤ Paint columns and treat with anti graffiti coating

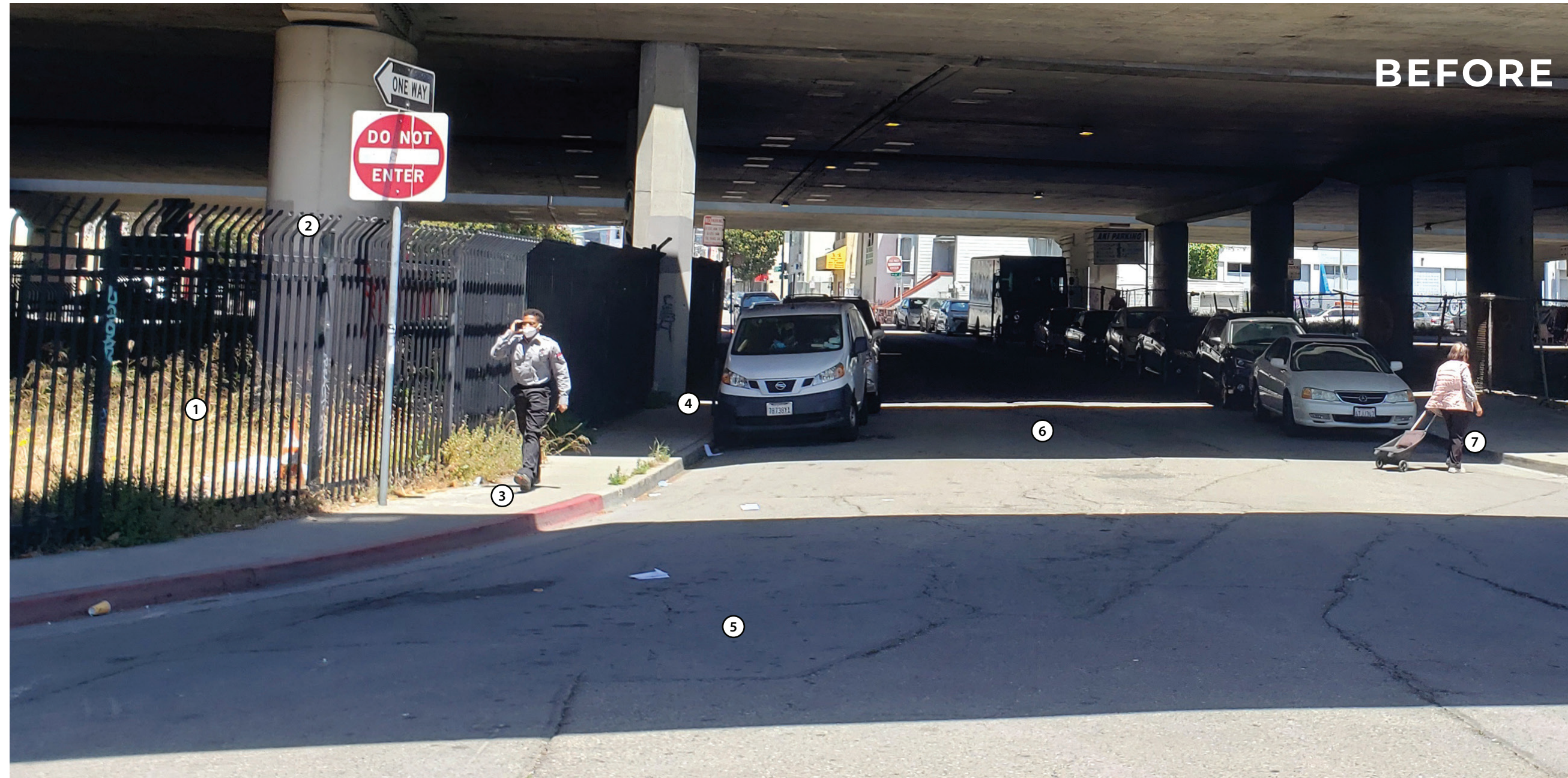
ARCHITECTURE & ENGINEERING

⑥ Move fence back to expand public space and incorporate columns into surface treatments

AIRSPACE

⑦ Extend graphic treatment to columns in adjacent airspace

PLANTED PASSAGEWAY: SHOWN AT WEBSTER ST UNDERPASS



PLANTED PASSAGEWAY OPTIMIZING FOR PEOPLE PASSING THROUGH

In many cases, an underpass is not a place to linger, but a space to pass through. Planted Passageway optimizes the underpass for people moving through the space. This design approach is appropriate to underpasses that serve as connectors between neighborhoods or serve important roles in pedestrian and bicycle networks. The City of Oakland has identified Webster Street as a future Class IV bikeway. Here, the Planted Passageway design buffers sounds from the Webster Tube traffic with a solid sound wall, adds lush, shade-tolerant vegetation, and expands pedestrian space. Planting areas are sculpted into mounds and site furnishings are limited to encourage movement rather than lingering in the space.

EXISTING ISSUES

- ① Unused space behind fence accumulates weeds and trash
- ② Tall picket fence with overhanging spikes
- ③ Narrow sidewalk
- ④ Parked cars and fence constrict pedestrian space and visibility near intersections
- ⑤ Underutilized roadway space
- ⑥ No striping to delineate car and bicycle space
- ⑦ No curb cuts or crosswalks, reducing accessibility

PLANTED PASSAGEWAY: SHOWN AT WEBSTER ST UNDERPASS



LIGHTING

① Provide pedestrian lighting that highlights planting at night

SIGNAGE

② Add pedestrian wayfinding signage

FURNISHINGS

③ Provide deep shaded seating for pedestrians to rest

SURFACE

④ Use color and detectable edges to distinguish between bike and pedestrian space

⑤ Use decorative paving to enhance pedestrian experience

PLANTING

⑥ Remove picket fence - where not required to restrict access to freeway structures - and use additional space for lush, shade tolerant planting and walking path

⑦ Use planting to delineate pedestrian and bicycle space

ARCHITECTURE & ENGINEERING

⑧ Provide solid soundwall two feet taller than line of site to traffic in Webster Tube to reduce sound pollution

⑨ Remove parking on one side of street and provide protected bikeway at grade with sidewalk.
Note: Oakland's Bicycle Plan proposes standard bike lanes here. At grade bikeway may require detectable warnings and additional study.

PROGRAMMED PLACE: SHOWN AT MADISON ST UNDERPASS



PROGRAMMED PLACE ACTIVATE AIRSPACE WITH APPROPRIATE USES

In some special cases, the space under freeways can be activated by incorporating appropriate uses. Successful uses for this airspace include parking, farmers markets, skate parks, public spaces, temporary housing, and dog parks. The design here shows a skate park under the Madison St. underpass. Adjacent housing developments, lack of local recreational space, and neighboring uses that can tolerate noise make this a good site for a skate park. A strong understanding of local context and community needs is essential to selecting a program compatible with the site and beneficial to the community. Programmed places can be a community asset if they serve real needs, but can be a liability if they are not well-used and well maintained.

EXISTING ISSUES

- ① High-glare lighting fixtures
- ② Razor wire on chain-link fence
- ③ Unused airspace becomes a liability
- ④ Litter on sidewalk and in gutter
- ⑤ Existing buffered bike lane
- ⑥ Trash in airspace from lack of regular maintenance
- ⑦ Vehicle signage infringing on narrow sidewalk

PROGRAMMED PLACE: SHOWN AT MADISON ST UNDERPASS



LIGHTING

- ① Incorporate lighting into freestanding architectural elements
- ② Provide sufficient lighting for evening use of skate park

SIGNAGE

- ③ Add pedestrian wayfinding signage and skate park signage

FURNISHINGS

- ④ Incorporate skate-friendly seating at border with sidewalk
- ⑤ Provide freestanding skate elements, avoid attaching to underpass

SURFACE

- ⑥ Provide graphic treatment on fence/wall surrounding skate park

ARCHITECTURE & ENGINEERING

- ⑦ Avoid attaching anything to underpass structure, preserve access to structure for inspections and maintenance
- ⑧ Consider enclosing skate park with rolling gate to control hours of use but preserve connection to sidewalk

AIRSPACE

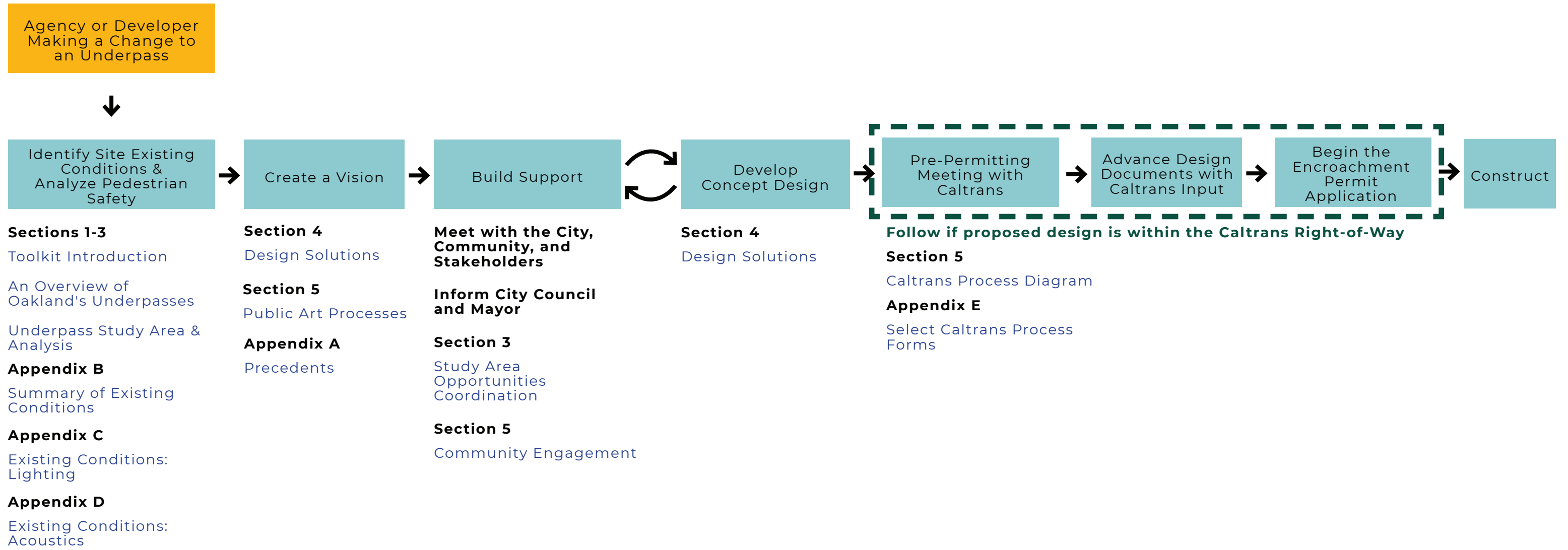
- ⑨ Conduct sufficient research and community engagement to provide airspace uses that will be well-used and provide real benefit
- ⑩ Consider maintenance and security requirements of airspace uses and plan for longterm maintenance

Note: Oakland Bike Plan proposes protected bike lane, not shown.

SECTION 5

Implementation

PROCESS DIAGRAM

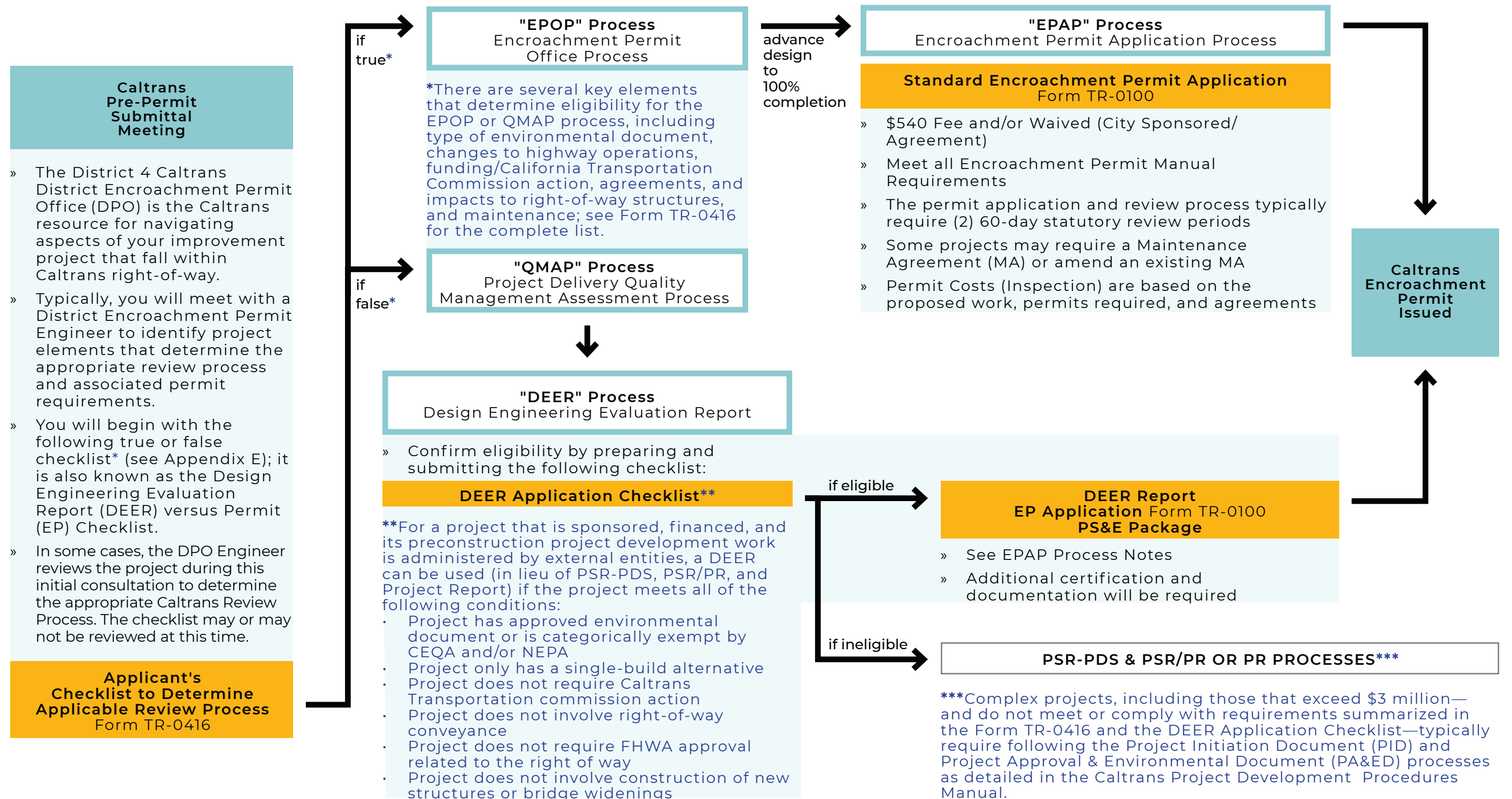


RESEARCH & IDENTIFY FUNDING RESOURCES

Section 6
Funding Sources

CALTRANS PROCESSES

Overview. The Caltrans process can range from a simple over-the-counter Encroachment Permit to a complex review process that requires approval from Caltrans Functional Units (departments). Generally, improvement projects that follow the Caltrans Highway Design Manual (HDM) and Project Development Procedures Manual (PDPM) closely, and use standard Caltrans details and materials, will simplify the process. The District 4 DPO can be reached at (510) 285-4401 or D4Permits@dot.ca.gov.



PUBLIC ART PROCESSES

Overview. The City of Oakland provides various public art avenues to consider for underpasses. Improvements in proximity to, but not on, Caltrans property can be relatively simple. In 1989, the City adopted an ordinance authorizing the allocation of 1.5% of municipal capital improvement project costs to commission and acquire public art. In 2014 the City adopted a new requirement for .5% of residential or 1% of nonresidential private development project costs for freely accessible public art on site or within the public right of way.¹

"Paint the Town"
Temporary Street Mural Program

Oakland Paint the Town
Online Application Form

- » See program guidelines²
- » Maintenance not included; murals last ~1 year
- » Community volunteers paint on the roadway
- » **Priority Neighborhoods** (Section 2) may be eligible for funding support
- » Application submission, review, and approval through **OakDOT's Safe Streets Division Bicycle & Pedestrian Program**
- » **PAAC** receives a report-out on any original public art murals with artist' design
- » Additional support provided by **Eastside Arts Alliance** and **Safe Passages**
- » Best for low-volume residential roadway underpasses; for other sites, contact OakDOT early in project development

Public Art in Private Development

Public Art for Private Development Checklist⁶

- » Requirements for public art projects proposed through private development must follow this checklist
- » See "Additional Requirements for Projects Proposed for the Public Right of Way": Community Outreach and Support Documentation; Insurance Documentation; Permissions
- » **Public Art in Private Development Ordinance 15.78.070 C (1)** allows the developer "by special application approved by the City, following review and approval from the **Public Art Advisory Committee**, complete an **alternative equivalent proposal** to install freely accessible art in the State highway right-of-way or on property owned by other public agencies."
- » City Council approval is required prior to application to the state

Deaccessioning & Infrastructure Redesign
Indefinite Removal of Art

- » Deaccessioning varies widely by individual work
- » Deaccessioning requires review and approval by the PAAC and City Council, if funded by the City
- » Separate from deaccessioning, the city also has paths for revisiting and redesigning existing work

Mosaic Trash Cans & Murals on Utility Boxes

Adopt-A-Spot
Online Application Form

- » "How to Mosaic a Trash Can,"³ is a video overview of the Mosaic Trash Can application and implementation
- » Both use the same application and are available through **City of Oakland Volunteer Services⁴**
- » Oakland's Adopt-a-Spot program manages both, which provides volunteer guidelines and resources
- » Application submission, review, and approval process is through **Oakland Public Works** (OPW)
- » **PAAC** reviews original artwork for utility boxes
- » OPW provides tools and technical assistance
- » Funding is available through **Keep Oakland Beautiful's** Small Grant Program⁵

Public Art Requirements for Public Capital Projects

Public Art Program Call for Artists
Requests for Qualifications/Proposals⁷

Public Art Advisory Committee (PAAC) Proposal Review Form⁸

- » **Public Art Advisory Committee** makes a final recommendation to **City Council**
- » **PAAC** approves and recommends all City funded public art projects, and art projects proposed for placement on City and Caltrans property
- » **Cultural Affairs Division** administers all aspects of the Public Arts Program

¹ <https://www.oaklandca.gov/topics/public-art-in-oakland>
² <https://cao-94612.s3.amazonaws.com/documents/Paint-The-Town-Guidelines1.pdf>
³ <https://www.youtube.com/watch?v=TCL4I7shWx8&t=27s>
⁴ <https://www.oaklandca.gov/services/apply-for-adopt-a-spot-online>
⁵ <https://www.keeпоaklandbeautiful.org/kob-small-grant-program.html>
⁶ <https://cao-94612.s3.amazonaws.com/documents/Oakland-Public-Art-in-Private-Development-Application-Supplemental-Checklist-2018-final.pdf>
⁷ <https://www.oaklandca.gov/services/public-art-call-for-artists>

COMMUNITY ENGAGEMENT

We must engage communities most impacted by the negative impacts of underpasses. The following steps are designed to ensure that underpass improvements adequately serve those who would be the most impacted.

Step 1. Identify appropriate staff and/or team to complete a Community Engagement Plan.

Step 2. Fill out the Oakland Department of Race and Equity's Inclusive Public Engagement Planning Guide.¹

Step 3. Identify and partner² with local stakeholders, including community-based organizations that have experience working with the community in the proposed project area. Refer to the Accessible Meeting toolkit

- » To ensure inclusion of the disability community, refer to the **Accessible Meeting Checklist** (<https://www.oaklandca.gov/documents/accessible-meeting-toolkit>) and the **ADA Effective Communications Policy** (<https://oaklandca.s3.us-west-1.amazonaws.com/government/o/PWA/o/EC/s/ADA/oak067277.pdf>)

Step 4. Identify and contact existing residents, employees, business owners, neighbors, and other stakeholders. Be sure to include all who are affected by the process/action and those who typically do not participate in government-led community engagement.

Step 5. Collaborate with OakDOT's Racial Equity Team to review and provide feedback on the proposed Community Engagement Plan.

Continued on next page

¹ <https://cao-94612.s3.amazonaws.com/documents/View-Report-Inclusive-Engagement-Plan.pdf>

² Partnering with Community-Based Organizations for More Broad-Based Public Engagement: https://www.ca-ilg.org/sites/main/files/file-attachments/partnering_with_comm_based_orgs_final.pdf

³ <https://www.oaklandca.gov/resources/oakdot-geographic-equity-toolbox>

Continued from previous page

Step 6. Collect demographic data related to the project area to better understand how to be culturally reflective of the community the project is in. Identify priority areas with OakDOT's Geographic Equity Toolbox.³

Step 7. Identify the future conditions in the project area that will be improved for Oakland residents. Identify alignment with City plans, policies, and programs.

Step 8. Plan and publicize community engagement utilizing inclusive engagement best practices.

Step 9. Conduct community engagement activities.

Step 10. Evaluate, summarize, and present back to key stakeholders.

SECTION 6

Funding Sources

FUNDING SOURCES

There are three main ways to fund projects:

- 1. Public Funding:** Local, regional, state, and federal grants; local ballot measures.
- 2. Private Funding:** Private development and sponsorship.
- 3. Partnerships:** Between public agencies, community-based organizations, and others invested in project goals.

The following page highlights a list of funding sources recommended by the Oakland Department of Transportation.

FUNDING SOURCES

Potential Public Funding Programs	Potential Public Funding Sources	Eligible Project Types	Funding Source Reference
Active Transportation Program (ATP)	Caltrans	Bike or pedestrian facilities; safety projects; public health and equity advancing	https://dot.ca.gov/programs/local-assistance/fed-and-state-programs/active-transportation-program
Sustainable Transportation Equity Project (STEP)	California Air Resources Board	Bike or pedestrian facilities; Active Transportation Plan; Bike Plan; Pedestrian Plan; Safe Routes to School Plan; Capacity Building (NI Programs—education, engagement, demo projects, campaigns); public health and equity advancing	https://ww2.arb.ca.gov/our-work/programs/low-carbon-transportation-investments-and-air-quality-improvement-program-1
Local Partnership Program (LPP)	California Transportation Commission	Bike and pedestrian facilities	https://catc.ca.gov/programs/sb1/local-partnership-program
Local Streets and Roads (LSR) Program	California Transportation Commission	Complete Streets Components; safety projects; bike lanes	https://catc.ca.gov/programs/sb1/local-streets-roads-program
Highway Safety Improvement Program (HSIP)	Caltrans Local Assistance / FHWA	Safety projects on bike facilities; safety projects on pedestrian facilities	https://dot.ca.gov/programs/local-assistance/fed-and-state-programs/highway-safety-improvement-program
Congestion Mitigation and Air Quality Improvement (CMAQ) Program	FHWA	Bicycle facilities	https://www.fhwa.dot.gov/environment/air_quality/cmaq/
Sustainable Communities Planning Grants	Caltrans Division of Transportation Planning	Active Transportation Plan; Bike Plan; Pedestrian Plan; Safe Routes to School Plan	https://dot.ca.gov/programs/transportation-planning/regional-planning/sustainable-transportation-planning-grants
Affordable Housing and Sustainable Communities Program (AHSC)	Strategic Growth Council and Department of Housing and Community Development	Bike and pedestrian facilities; NI Programs—education * Must connect with affordable housing component of the grant	https://hcd.ca.gov/grants-funding/active-funding/ahsc.shtml
Urban Greening	California Natural Resources Agency	Bicycle and pedestrian facilities	https://resources.ca.gov/grants/urban-greening
Clean Mobility Options	California Air Resources Board	Bike share; infrastructure improvement projects	http://www.cleanmobilityoptions.org/
Citywide Underpass Improvement Program	FY 21-23 Oakland Capital Improvement Program (CIP) eligible	Freeway underpass improvement projects	https://www.oaklandca.gov/topics/capital-improvement-program
Clean California Local Grant Program	Caltrans	Streets and roads, tribal lands, parks, pathways, transit centers, public art, transportation art	https://cleancalifornia.dot.ca.gov/local-grants

SECTION 7

Recommendations for Next Steps

RECOMMENDATIONS FOR NEXT STEPS

Moving forward, some key points to keep in mind as you work to improve your neighborhood underpasses:

- The relationship between adjacent land uses and uses within the underpass matters. A neighboring mixed use area with lots of visitors could benefit from nearby parking and pedestrian-oriented wayfinding beneath the underpass. An area with increasing housing density and minimal open space could explore programming beneath the underpass. A narrow underpass connecting two quiet residential areas may only need a new installation of excellent lighting, fresh paint, and reconsidered maintenance strategy.
- Strategies are only effective if they support and serve adjacent existing and successful business districts and communities:
 - » Active ground-floor land uses positively impact communities
 - » Make underpass spaces serve surrounding areas at different times. For example, the Rockridge BART station is multifunctional: it includes a dog and skate park and a parking area (paid parking on weekdays, free parking on weekends serving surrounding businesses)
 - » Focus resources on all elements up to and just beyond Caltrans jurisdiction (adjacent intersection improvements, lighting at entries, etc.)

APPENDIX A

Precedents

GO AVE 26

LA-MAS / CITY OF LOS ANGELES

\$ + Temporary

PROJECT COST FUNDING TIMELINE \$145,850
Transit Center
January - December 2017

PROJECT GOAL & PROCESS
Project Goal:
“Test physical design interventions and engagement strategies that are scalable on a county-wide level” by looking at affordable and temporary strategies, replicability, and partnership development “between transportation advocates, community organizations, and different government entities.”

Project Process:
- Determining Need: Intercept & Online Surveys, Social Media, Community Events
- Design: Park space, Signage, Murals, Sidewalk/Fences/Poles
- Permitting Processes
- Install: in-house fabrication and installation with residents and partners, incl. Caltrans
- Document Navigating Bureaucracy and Permitting

STAKEHOLDERS LA Metro, LADOT, Caltrans, LA Walks, Investing in Place, LA County Bicycle Coalition; Department of Recreation and Parks; City Council

Existing concerns about visibility and physical safety conditions addressed by design:

- SENSORY ISSUES & CAUSES**
1. Narrow sidewalk;
 2. Dangerous Pedestrian Crossings;
 3. Enclosed Underpasses
 4. Limited wayfinding and pedestrian signage

Strategies correlate to conditions above:
Strategy 1: Graphically defining safe pedestrian navigation, wayfinding, reinforcing sight lines to destinations (ex. transit stop)
Strategy 2: Graphically painted bollards, developing and extending crosswalk graphics into connected sidewalks
Strategy 3: Graphic painted patterns on sidewalks and walls of underpass (high contrast, black and white paint for ease of maintenance)
Strategy 4. Wayfinding using transit standards, murals, and sculptural signage.

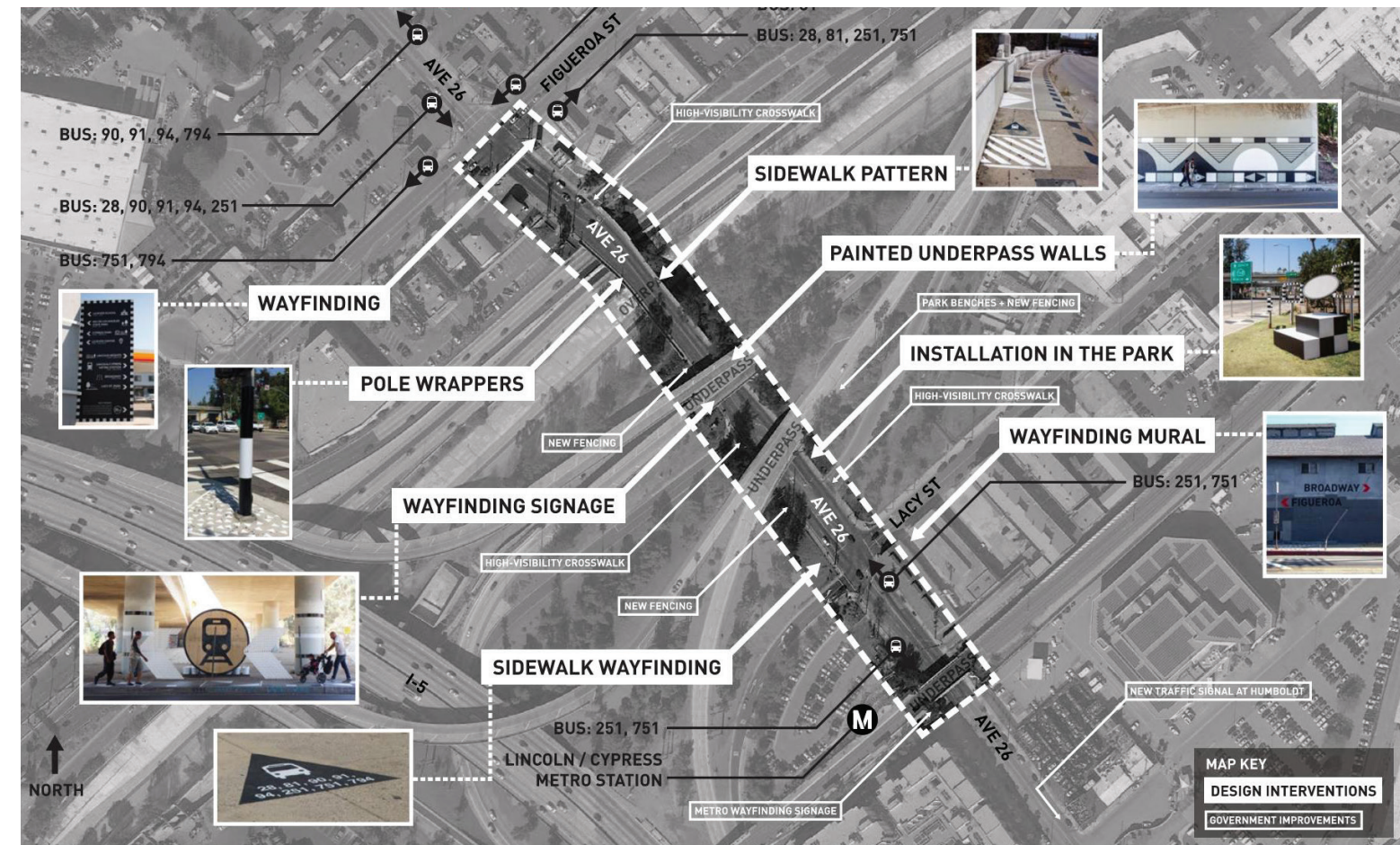
MAINTENANCE
Focused on black and white graphics in part because they are easiest to maintain
Obtained city resolution on mural maintenance
Established maintenance agreement with Bureau of Street Lighting
As temporary solutions, they may not have the same challenges as longterm/permanent solutions.

REPLICABILITY
This project was designed and documented as a guide for replicability across Los Angeles county; reports documented impact and evaluation, including public feedback.

<https://www.mas.la/go-ave-26>
https://www.theeastsiderla.com/real_estate/architecture_and_urban_design/the-first-steps-are-being-taken-to-make-avenue-26-more-pedestrian-friendly/article_dc63c779-d07a-5172-8936-be91aa69dd99.html



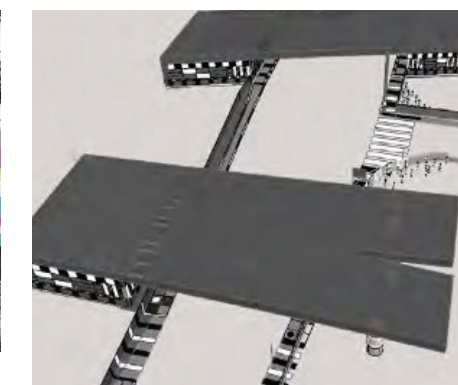
Existing Conditions



Map from Go Ave 26 Final Report of Design Interventions



Community Engagement



Overpass Strategy: Enhanced Pedestrian Visibility Area



Surface Treatments: Mural and Sidewalk Painting for Wayfinding and increasing Lightness

BROADWAY

NIMITZ FREEWAY BROADWAY UNDERPASS CITY OF OAKLAND

\$\$ + Permanent

PROJECT COST FUNDING TIMELINE

\$250,000
Artist: Team of Five
Public art funded by a 1.5% set-aside from public building projects
1998 - 2005

PROJECT GOAL & PROCESS

Project Goal:
This was an effort to “[liven] up the dim, dreary underpass, now hemmed in by chain-link fences and parking lots filled with cars and piles of rusted junk... The idea behind the underpass art is to create a more ‘pedestrian friendly’ walkway between downtown and Jack London Square...”

Process:
- City of Oakland issued Request for Qualifications (RFQ) to artists for underpass art installation.
- Ad-hoc selection panel recommended approval to one of 24 entries.
- City Council provided final approval.

STAKEHOLDERS

Local artists; City Council; City Public Art Panel; Jack London Improvement District

SENSORY ISSUES & CAUSES

Challenging intersection and underpass that is not welcoming to pedestrians. Poor lighting creates high contrast spaces over crosswalks in front of an on-ramp, leading to poor visibility. Lack of place-making does not signal to pedestrians that they are welcome. Currently the artwork is not maintained to original intent. The dark colored ceiling (from traffic) contributes to the darkness of the underpass.

SOLUTIONS & TOOLS

Gateway Art: Guardrails “buffed to a shine” weave in and out of large freeway support columns that are painted red and have 3-dimensional ornamentation. Sculptural guardrails cleaned and treated with pigeon deterrent in 2015, but pigeon population continues to be a challenge in the area.

Paving: Paving treatment was a recommendation of original artist proposal, value-engineered out of final designs and never implemented. Also raised some concerns with Public Works and Caltrans.

Surface Treatment: Red columns are uplit from caged lighting affixed to ground.
Lighting: From the ceiling, “two narrow strips of amber lights...trace the motion of the traffic on the freeway above.” 2015 upgrades include cages to prevent vandalism.
Fencing: The guardrail divides the sidewalk from individuals experiencing homelessness, and functions as an alternative to standard chain-link fencing with screening fabric, creatively separating the path from any adjacent uses.

MAINTENANCE

Jack London Improvement District cleans and maintains all public right-of-way areas along and under I-880; They have hosted workshops, walkthroughs, and surveys to understand community priorities for improvement.

Art is not 'buffed' for maintenance as originally envisioned. Proposed maintenance requirements should try to match maintenance resources or create new jobs(?). Several columns remain painted a deep red, as originally envisioned by the artists.

REPLICABILITY

This underpass is one block away from our underpass study area. This art installation serves as a reflection point for today's considerations and design approach.

Importantly, the artwork is not affixed directly to the columns, but their own supporting posts with separate footers anchored to the ground.

An art installation need to integrate, or pair with other tools, to address the sensory issues and dangerous multi-modal conditions.



Broadway Gateway art installation soon after construction.



Broadway Gateway art installation 20 years after construction.



Broadway gateway art installation does not address the intersection's complex traffic pattern, including a freeway on-ramp and the ramp into the Webster Tube, and especially dangerous high-contrast conditions for poor visibility.

<https://www.sfgate.com/bayarea/article/Art-Project-OKd-For-Oakland-Underpass-250-000-2792562.php>
<https://jacklondonoakland.org/news/2018/2/9/a-new-underpass>

EAST CAMPBELL AVENUE PORTALS

STATE ROUTE 17
CITY OF CAMPBELL

\$\$\$ + Permanent

**PROJECT COST
FUNDING
TIMELINE**

\$4.85 million
>90% federal and state programs (Metropolitan Transportation Commission One Bay Area Grant program; Valley Transportation Authority Bicycle Expenditure Plan; Transportation Development Act)
2010 - 2016

Project Goal:
Use landscape architecture, engineering, and lighting to make Campbell's busiest underpass more safe for pedestrians, between Pruneyard Shopping Center and Downtown.

**PROJECT GOAL
& PROCESS**

Project Process
- City Council authorized Public Works to release RFP for Public Art
- Selection Committee selects an artist
- City Council approved resolution authorizing City Engineer to execute contract
- Concept submitted and revised for approval to Caltrans Art Review Committee
- Civic Improvement Commission provided input on final design before City Council gave final approval

STAKEHOLDERS

City of Campbell Public Works Department senior civil engineer; Caltrans; Artist Susan Zuccola; Biggs Cardosa (prime consultant)

**SENSORY ISSUES
& CAUSES**

Narrow, 4' wide sidewalk under a 15'-3" underpass created a sense of physical vulnerability to adjacent traffic. Low lighting, insufficient protection, and loud sound of traffic. No signals that pedestrians are welcome or encouraged from a lack of signage or pedestrian-oriented use.

**SOLUTIONS &
TOOLS**

Sound Absorption, Safety Barrier: Wall preserved in between sidewalk and road.
Create more space for pedestrians: Widened sidewalk to 26' and (excavated 4,700 yd³) while protecting structural girders
Lighting: Wall lights and overhead lighting; widened sidewalk let in more light.
Gateway Placemaking: Public Art and a Landscaped Terrace provide significance to the underpass that a public destination is in walking distance of this location.

MAINTENANCE

New plantings and mulch, painted sidewalks, and public art, introduce new types of maintenance into the overpass.
Painted graphic appears will require minimal maintenance due to its simplicity.

REPLICABILITY

Cost: The cost is high, but still more affordable than removing a freeway.
Caltrans Standards: Improved upon current Caltrans underpass design standards; "all work was coordinated with Caltrans to obtain permits for improvements within Caltrans ROW and for modifying the existing Campbell Ave. Undercrossing."

a-b. East Campbell Avenue Portals Project, Campbell, CA. (Image: City of Campbell via Curbed, <https://archive.curbed.com/2016/8/11/12441906/freeway-underpass-california-walking>)
d-e. Susan Zuccola, "Grow" for East Campbell Avenue Portals Project, Campbell Avenue underpass, Campbell, CA. (Image: <https://susanzuccola.com/Grow>)
f. East Campbell Avenue Portals Project, Campbell, CA. (Image: <https://biggs cardosa.com/index.php/projects/transportation/pedestrian-bicycle/campbell-avenue-portal-project>)



Previous Condition



Walled and Illuminated Pedestrian Portals



Overall Improvements



APPENDIX B

Study Area Underpasses: Existing Conditions Summary Table

	OAK STREET	MADISON STREET	JACKSON STREET	WEBSTER STREET
UNDERPASS HEIGHT & DEPTH	14'5" high 130' deep	14'10" high 152' deep	>15' high 149', 22' deep	14'7" to 14'10" high 37'6", 149', 26', 26'9" deep
SIDEWALK WIDTH	East: 9'2" West: 9'	East: 8'9" to 9'2" West: 8'9" to 9'2"	East: 9' West: 8'	East: 9'6" West: 3' - 4'6"
ADJACENT USES	East: Embankment West: Oak Street Community Cabins, Parking. Freeway on- and off-ramps introduce additional tension between pedestrian crossings and freeway traffic. Barrier between the Cabins (temporary housing) and adjacent activity is low compared to typical residential situations.	East: Oak Street Community Cabins (north of freeway), parking beneath and south of freeway West: Parking. Barrier between the Cabins (temporary housing) and adjacent activity is low compared to typical residential situations.	East: Parking West: Embankment, fenced off, which is currently used for a tent encampment. Chair, shaded by mature tree, located at southern end of encampment for an individual to collect money from cars stopping at the freeway off-ramp.	East: Parking West: Vegetated, fenced median next to Alameda-bound Webster tube
FENCING & GATES	East: Chain-link fence (6'), permeable metal picket fence (7'6" - 8') West: Chain-link fence (6'), with privacy screening at/near Cabins; gates secured with locks, chains, and electronic keypads	East: Chain-link fence (6') with privacy screening at Cabins West: Chain-link fence (6') plus coiled barbed wire; gates secured with chains, locks, and electronic keypads; refuse collects along fencelines	East: Chain-link fence (6'8'); two forms of barbed wire (coil, 3 rows) West: Chain-link fence (6'); individuals in the tent encampment use found materials for privacy	East: Chain-link fence (6'); West: Metal fencing with sharp, bent "candy cane" tips (8'6")
VEGETATION	East: Sloped embankment, bare soil in shade and wild growth in sun West: Mature trees parallel to the freeway; overgrown vegetation on both sides	Row of mature trees runs parallel along north and south of freeway; voluntary plants along fenceline and curb	East: voluntary plants grow above eye level and encroach where the sidewalk and crosswalk meet West: Vegetation is particularly dense at the embankment; ivy and mature pine trees create deep shade; pine needles cover bare soil; extensive massing of large shrubs	Median in between surface level underpass and Webster tube, covering the grade change, covered with groundcover
SIGNAGE & STRIPING	Signage for drivers leaving off-ramp for landmark orientation, for approaching freeway on-ramp. Crosswalks exist at each approach to underpass. One crosswalk split by median. Restrictive pedestrian signage.	Restrictive pedestrian signage along fencing beneath underpass. Crosswalks exist at each approach to underpass.	Jack London district signage is used across the street (SW corner of 5th street), elevated on light fixture. Freeway on-ramp signage at median. Restrictive pedestrian signage. Striping at all intersections. Pedestrian signals not installed at some intersections.	Striping and/or signage is lacking at the northwestern sidewalk crossing Webster Street, and southeast sidewalk crossing 5th Street. Neighborhood directional signage is in place for oncoming traffic.
ACOUSTICS	Existing noise measurement DNL on street: 73 dBA; at underpass: 75 dBA Existing noise measurement Avg Leq(h) on street: 68 dBA, at underpass 70d BA	Existing noise measurement DNL on street: 76 dBA; at underpass: 78 dBA Existing noise measurement Avg Leq(h) on street: 71 dBA, at underpass 73 dBA	Existing noise measurement DNL on street: 75 dBA; at underpass: N/A Existing noise measurement Avg Leq(h) on street: 70 dBA, at underpass N/A	Existing noise measurement DNL on street: 75 dBA; at underpass: 77 Existing noise measurement Avg Leq(h) on street: 70 dBA, at underpass 72
LIGHTING & VISIBILITY	Embankment area is dark during day and night; this contrast reduces the sense of safety and security for pedestrians	Portions of the sidewalks adjacent to underpass entrances do not meet City illumination standards, reducing pedestrian safety and security	Crosswalk illumination adjacent to I-880 on-ramp entrance does not meet City illumination standards, reducing pedestrian safety. Embankment area is dark day and night. This contrast reduces the sense of safety and security for pedestrians.	Large portions of the sidewalks do not meet City illumination standards, reducing pedestrian safety and security.
UNIQUE CONDITIONS	Oak Street Community Cabins adjacent to sidewalk; on- and off-ramp exits, with associated signage and vehicular speeds; the embankment's dense vegetation and bare soil beneath the underpass in the shade	Oak Street Community Cabins adjacent to sidewalk; signage within sidewalk; use of barbed wire; depth of visibility for pedestrians looking east and west	Barbed wire. Embankment with a tent encampment. Secondary overpasses on medians in addition to the primary overpass depth creates additional intersections for vehicles and pedestrians to navigate and additional infrastructure-scaled objects, some of which lack crossing signals. Extensive presence of vegetation, which blocks drivers' visibility on off-ramp of pedestrians at sidewalk corner.	Greatest depth of underpass area with narrowest road width. Adjacent use to the west is cars driving parallel to sidewalk, heading into the tube. Both north and south entrances have unusual pedestrian crossing conditions. Only one lane of traffic.

APPENDIX C

Existing Conditions Report: Lighting

LIGHTING ROADWAY CLASSIFICATION & CRITERIA



Roadway Classification Diagram*

LEGEND

- Major Roadway
- Collector Roadway

* City of Oakland classification

CITY OF OAKLAND STREET LIGHTING GUIDELINES					
Roadway & Area Classification		Minimum Standards		Optimum Standards	
		Illuminance (Footcandles)	Uniformity Ratio (Avg. to Min.)	Illuminance (Footcandles)	Uniformity Ratio (Avg. to Min.)
Major	Downtown	2.0	3 to 1	3.5	2 to 1
Collector	Downtown	1.5	4 to 1	2.5	3 to 1

Per City of Oakland Streetlighting Warrants, updated 2013

OAK STREET EXISTING LIGHTING CONDITION



LEGEND

- Surface-Mounted LED Downlight
- Pole-Mounted LED Cobrahead
- + Luminaire
- Day / Night Illumination Levels (footcandles)
- ☀ Denotes Full Sun Condition

Oak Street Existing Lighting Diagram*

LIGHTING CRITERIA

- City of Oakland Classification: Major Roadway, Downtown Area.
- City of Oakland Minimum Standards: Illuminance - 2.0 footcandles, Uniformity Ratio - 3:1
- City of Oakland Optimum Standards: Illuminance - 3.5 footcandles, Uniformity Ratio - 2:1

*Day illumination levels as of 12 PM, 21 October 2020. Night illumination levels as of 8 PM, 20 October 2020.

MADISON STREET EXISTING LIGHTING CONDITIONS



LEGEND

- Surface-Mounted LED Downlight
- Pole-Mounted LED Cobrahead
- + Luminaire
- Day / Night Illumination Levels (footcandles)
- ☀ Denotes Full Sun Condition

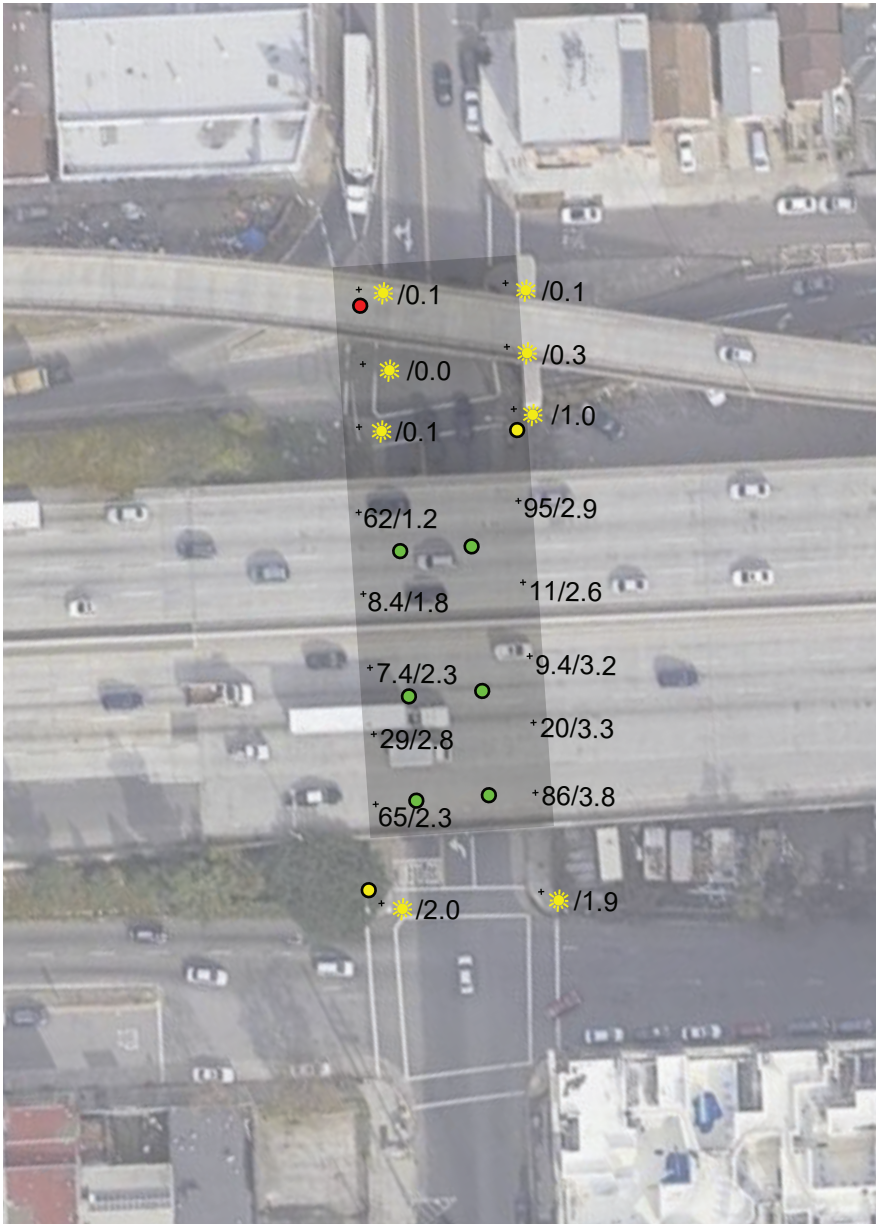
Madison Street Existing Lighting Diagram*

LIGHTING CRITERIA

- City of Oakland Classification: Major Roadway, Downtown Area.
- City of Oakland Minimum Standards: Illuminance - 2.0 footcandles, Uniformity Ratio - 3:1
- City of Oakland Optimum Standards: Illuminance - 3.5 footcandles, Uniformity Ratio - 2:1

*Day illumination levels as of 12 PM, 21 October 2020. Night illumination levels as of 8 PM, 20 October 2020.

JACKSON STREET EXISTING LIGHTING CONDITIONS



- LEGEND
- Surface-Mounted LED Downlight
 - Pole-Mounted LED Cobrahead
 - + Luminaire
 - Day / Night Illumination Levels (footcandles)
 - ☀ Denotes Full Sun Condition

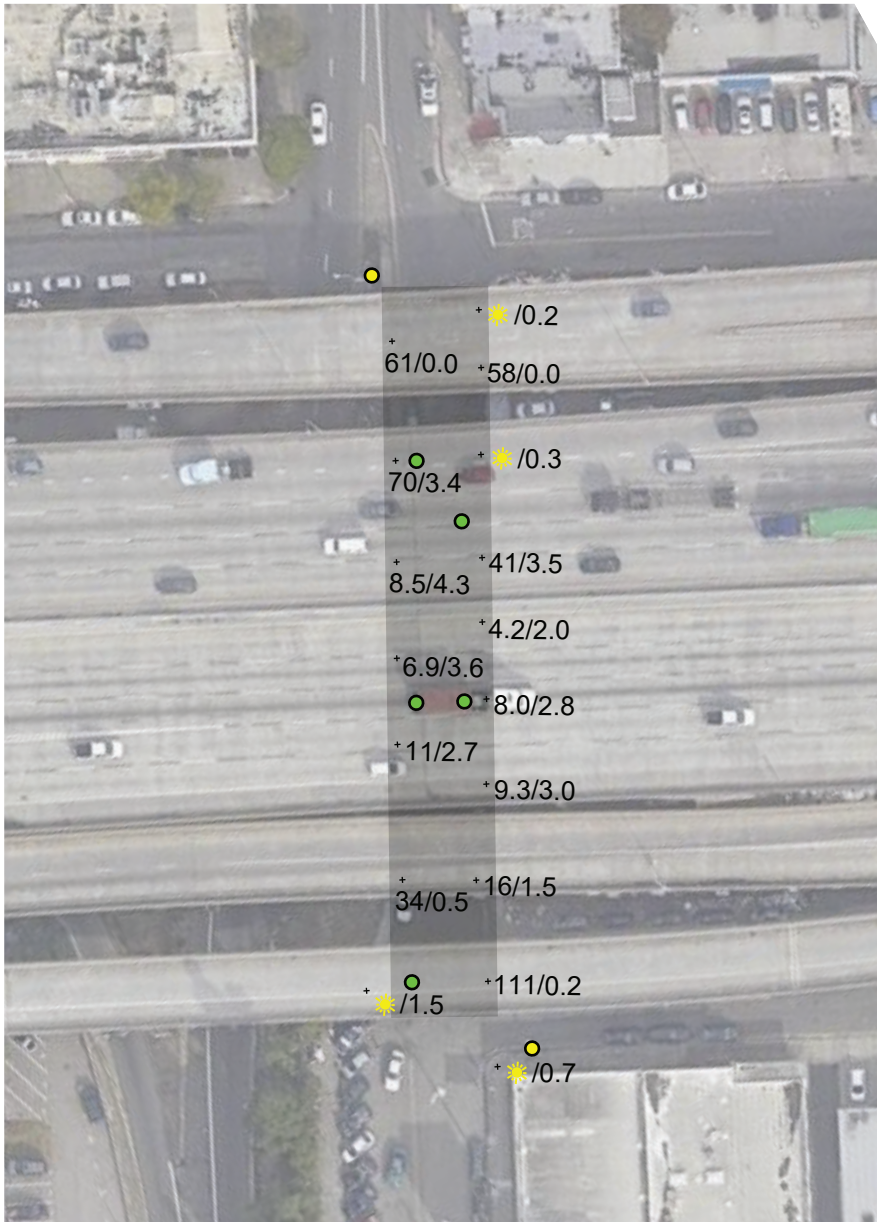
Jackson Street Existing Lighting Diagram*

LIGHTING CRITERIA

- City of Oakland Classification: Collector Roadway, Downtown Area.
- City of Oakland Minimum Standards: Illuminance - 1.5 footcandles, Uniformity Ratio - 4:1
- City of Oakland Optimum Standards: Illuminance - 2.5 footcandles, Uniformity Ratio - 3:1

*Day illumination levels as of 12 PM, 21 October 2020. Night illumination levels as of 8 PM, 20 October 2020.

WEBSTER STREET EXISTING LIGHTING CONDITIONS



LEGEND

- Surface-Mounted LED Downlight
- Pole-Mounted LED Cobrahead
- + Luminaire
- Day / Night Illumination Levels (footcandles)
- ☀ Denotes Full Sun Condition

Webster Street Existing Lighting Diagram*

LIGHTING CRITERIA

- City of Oakland Classification: Major Roadway, Downtown Area.
- City of Oakland Minimum Standards: Illuminance - 2.0 footcandles, Uniformity Ratio - 3:1
- City of Oakland Optimum Standards: Illuminance - 3.5 footcandles, Uniformity Ratio - 2:1

*Day illumination levels as of 12 PM, 21 October 2020. Night illumination levels as of 8 PM, 20 October 2020.

APPENDIX D

Existing Conditions Report: Acoustics

23 August 2021

Chris Kent
PGAdesign
444 17th Street
Oakland, CA 94612
kent@pgadesign.com

**Subject: “Walk This Way” Underpass Improvement Toolkit
Environmental Noise Measurements
Salter Project 20-0358**

Dear Chris:

As requested, we conducted environmental noise measurements at the project sites. The purpose of this study is to quantify the existing and future noise environments, compare them to relevant standards, and provide conceptual design recommendations.

RELEVANT STANDARDS AND GUIDELINES

City of Oakland Noise Element

The City of Oakland Noise Element contains a land-use compatibility matrix for the types of projects that are recommended at a site based on the existing environmental noise levels, as shown in the table from the City of Oakland General Plan below. Noise levels are given as L_{dn} or CNEL¹. For reference, the State of California requires interior noise levels from exterior noise sources to be DNL 45 dB in residences. The CALGreen interior noise requirement for commercial spaces is a maximum $Leq(h)$ ² of 50 dB during the loudest hour of the day.

¹ DNL (Day-Night Average Sound Level) – A descriptor for a 24-hour A-weighted average noise level. DNL accounts for the increased acoustical sensitivity of people to noise during the nighttime hours. DNL penalizes sound levels by 10 dB during the hours from 10 PM to 7 AM. For practical purposes, the DNL and CNEL are usually interchangeable. DNL is sometimes written as L_{dn} .

² L_{eq} – The equivalent steady-state A-weighted sound level that, in a stated period of time, would contain the same acoustic energy as the time-varying sound level during the same period.



LAND USE CATEGORY	COMMUNITY NOISE EXPOSURE (L_{DN} OR CNEL, dB)					
	55	60	65	70	75	80
Residential						
Transient lodging—motels, hotels						
Schools, libraries, churches, hospitals, nursing homes						
Auditoriums, concert halls, amphitheaters						
Sports arenas, outdoor spectator sports						
Playgrounds, neighborhood parks						
Golf courses, riding stables, water recreation, cemeteries						
Office buildings, business commercial and professional						
Industrial, manufacturing, utilities, agriculture						

Adapted from State of California—General Plan Guidelines, 2003 (Appendix C); Governor’s Office of Planning and Research

INTERPRETATION

NORMALLY ACCEPTABLE: Development may occur without an analysis of potential noise impacts to the proposed development (though it might still be necessary to analyze noise impacts that the project might have on its surroundings).

CONDITIONALLY ACCEPTABLE: Development should be undertaken only after an analysis of noise-reduction requirements is conducted, and if necessary noise-mitigating features are included in the design. Conventional construction will usually suffice as long as it incorporates air conditioning or forced fresh-air-supply systems, though it will likely require that project occupants maintain their windows closed.

NORMALLY UNACCEPTABLE: Development should generally be discouraged; it may be undertaken only if a detailed analysis of the noise-reduction requirements is conducted, and if highly effective noise insulation, mitigation or abatement features are included in the design.

CLEARLY UNACCEPTABLE: Development should not be undertaken.

Outdoor Activity Speech Intelligibility

The Environmental Protection Agency (EPA) published guidelines³ to protect public health from environmental noise. The findings suggest that noise levels at outdoor areas where people spend limited amounts of time should be limited to $L_{eq}(h)$ 55 dB. With regards to speech intelligibility, an outdoor $L_{eq}(h)$ of 60 dB allows for normal conversation at distances of up to six feet with 95% sentence intelligibility. Furthermore, a maximum $L_{eq}(h)$ of 70 dB is identified for intermittent noise, in order to prevent hearing damage from longer exposure.

The World Health Organization (WHO) also published guidelines for community noise⁴ to identify the effects of ambient noise levels on speech communication. In quiet environments, speech levels at one meter are typically 45 to 50 dBA, and can be up to 30 dB higher when shouting. For complete sentence intelligibility, the difference between the speech and ambient noise level should be 15 to 18 dB. Sentences may be 100% intelligible in ambient noise environments up to 55 dBA with a raised voice; and in ambient noise environments up to 65 dBA with a strained voice. For vulnerable groups (e.g., elderly, hearing impaired), lower ambient noise levels are often needed to achieve acceptable levels of speech intelligibility.

³ “Information on Levels of Environmental Noise Requisite to Protect Public Health and Welfare with an Adequate Margin of Safety.” The U.S. Environmental Protection Agency Office of Noise Abatement and Control. March 1974.

⁴ “Guidelines for Community Noise.” World Health Organization. April 1999.



MEASUREMENTS

We installed long-term (LT) noise monitors near five I-880 underpass locations from 25 September to 2 October 2020 to measure the existing noise environment. We also conducted short-term (ST) (i.e., 15 minute) measurements at the I-880 underpass locations. See **Figure 1** for the measurement locations. See **Table 1** for a summary of the measured and calculated noise levels.

Table 1: Existing Noise Measurements

Location	DNL (dBA)		Avg Leq(h) (dBA)	
	On Street	At Underpass ⁵	On Street	At Underpass ⁵
LT-1/ST-1 Broadway	75	81	70	76
LT-2/ST-2 Webster St	75	77	70	72
LT-3/ST-3 Jackson St	75	N/A ⁶	70	N/A
LT-4/ST-4 Madison St	76	78	71	73
LT-5/ST-5 Oak St	73	75	68	70

DISCUSSION

According to the land-use compatibility matrix, the existing noise environments at the I-880 underpasses are “clearly unacceptable” for playgrounds and neighborhood parks, which would be the closest appropriate category. The only “conditionally acceptable” use would be for industrial, manufacturing, utilities, and agriculture.

Our short-term measurements show that the noise environments at the underpasses are 2 to 6 dB higher than nearby sections of the same street. Our detailed analysis also indicated that noise at the underpasses contain more low frequency energy, which is commonly perceived as a rumble. This can be attributed to noise from I-880 above radiating through the concrete slab, as well as the noise build-up within the underpass concrete structure. At Broadway, proximity to the I-880 on-ramp was also a contributing factor to the higher measured noise levels.

The guidelines for speech intelligibility proposed by the EPA and WHO suggest the noise levels at the underpasses exceed recommendations for adequate communication. This would require occupants to speak in raised voices to communicate. Furthermore, noise levels commonly exceeded 100 dBA during high noise level events (e.g., sirens, motorcycle).

⁵ Calculated using offsets from the street-level long term measurements

⁶ We could not conduct a short-term measurement at Jackson Street due to construction activity.

The noise environment at the site is generally not conducive to prolonged occupation. For circulating pedestrians spending a limited amount of time in this environment, these transient noise levels could be considered acceptable. However, speech communication would be hindered, which might be essential during potential emergencies.

To achieve some noise reduction and reduce the likelihood of excessive speech interference at these sites, consider the following strategies:

- Incorporate sound-absorptive treatments to the underside structure of the highway
- Provide solid barriers to shield occupants from traffic noise that are localized and constructed in areas where people would commonly congregate (e.g., pedestrian tunnel)
- Modify pedestrian and traffic circulation patterns

NEXT STEPS

We look forward to your feedback and comments based on our preliminary findings. We expect that our next steps would focus on developing more detailed noise-reducing strategies (based on those listed above) to achieve acceptable acoustical environments.

*

*

*

This concludes our environmental noise measurements results and recommendations. Please call or write with any questions or comments.

Best,

SALTER



Blake Wells, LEED GA
Associate



Felipe Tavera
Associate



SALTER © 2020
FOR ACOUSTICAL DESIGN INFORMATION ONLY

WALK THIS WAY UNDERPASS IMPROVEMENT MEASUREMENT LOCATIONS

FIGURE 1

Salter #
20-0358

BMW/FTD
10.15.20

APPENDIX E

Select Caltrans Process Forms

APPLICANT'S CHECKLIST TO DETERMINE APPLICABLE REVIEW PROCESS

No.	Scope	True	False
1	Project has an approved environmental document (CE, ND, EIR, EIS, etc.) or project is CE by CEQA and/or NEPA and has completed studies or public outreach.		
2	Project design and submittal is complete (at 100%) and the EPAP includes all required supporting documents, reports, etc.		
3	Project doesn't involve any ROW conveyances (e.g., dedications, relinquishments, modifications to ROW limits, etc.).		
4	Project doesn't propose constructing new structures (e.g., earth retaining structures such as retaining walls, tie backs, soil nails, sound walls, culverts, etc.) that are not per Caltrans Standard Plans.		
5	Project doesn't propose conduits greater than 60" in diameter to be installed by trenchless methods or tunneling (diameter 30" and above) with depth of cover less than 15 feet.		
6	Project doesn't propose high priority utilities, liquid and gas carrier pipes on or through bridges/structures.		
7	Project doesn't propose structural modifications of Caltrans structures (certain superficial attachments are not considered structural modifications).		
8	Project doesn't propose new permanent stormwater treatment facilities, create 5000 sq. ft. or more of new non-highway impervious surface or create 1 acre or more of newer highway impervious surface.		
9	Project is not proposed in known slip/slide prone areas and proposed work will not adversely impact geological stability.		
10	Project doesn't require agreements to be executed with Caltrans, or, an agreement is required but Caltrans standard templates can be used (e.g., maintenance, lease, Joint Use Agreements, etc.).		
11	Project doesn't propose non-standard roadway design features (lane widths, super elevation, etc.) requiring a Design Standard Decision Document (Not applicable to utility-only projects).		
12	Project doesn't require CTC action for other than funding approval (e.g., relinquishments, new public road connections, etc.).		
13	Project doesn't propose new sound walls on bridges or modifications to existing sound walls on bridges.		
14	Project doesn't propose increasing highway capacity or converting operational nature of highway lanes (e.g. converting to HOT or Toll lanes, etc.).		
15	Project's total construction costs within the existing or future State highway right-of-way is \$1 million or less. (Not applicable to utility-only projects)		

I hereby certify that the above information provided related to this project is true and correct to the best of my knowledge and belief. I further understand and agree that if information contrary to aforementioned table at any stage during the Caltrans review process or if the project scope changes the results of any of the above elements, project may have to be managed through a different Caltrans Review Process and may be subject to delays, revisions, or denials.

 Name of Applicant

 Signature of applicant

 Date

Instructions:

1. This checklist is used to determine the appropriate Caltrans review process for encroachment projects on the State Highway System.
2. Applicants of projects that involve ground disturbance or have structure-related work are required to complete and attach this checklist with their EPAP submittal.
3. If "True" is checked for all the items in this checklist, the project will be managed through the EPOP. If any of the questions is checked "False", the project will be managed through the QMAP, with the following exceptions:
 - a. If # 2 is checked "False", the applicant should complete the design and resubmit their EPAP to the DPO. The DPO can be contacted for additional information or to request a free consultation to understand the requirements.
 - b. If # 15 (construction costs) is the only item checked "False", the District Encroachment Permit Engineer in consultation with the impacted functional units will determine the appropriate Caltrans review process.
4. If additional information is needed on any of the elements listed in the checklist, please contact the appropriate DPO:
<https://dot.ca.gov/programs/traffic-operations/ep/district-contacts>
5. This checklist may be reviewed with the applicant at the initial consultation/pre-permit submittal meetings to determine the appropriate Caltrans review process.

Abbreviations:

1. **CE:** Categorical Exempt
2. **ND:** Negative Declaration
3. **EIR:** Environmental Impact Report
4. **EIS:** Environmental Impact Statement
5. **CEQA:** California Environmental Quality Act
6. **NEPA:** National Environmental Policy Act
7. **EPAP:** Encroachment Permit Application Package
8. **ROW:** Right-of-way
9. **CTC:** California Transportation Commission
10. **HOT:** High Occupancy Travel
11. **EPOP:** Encroachment Permits Office Process
12. **QMAP:** Project Delivery Quality Management Assessment Process
13. **DPO:** District Encroachment Permit Office

Design Engineering Evaluation Report Guidelines

These guidelines replace the Permit Engineering Evaluation Report review process and requirements for the project delivery program specified in the Project Development Procedures Manual.

For a project that is sponsored, financed, and its preconstruction project development work is administered by external entities, a Design Engineering Evaluation Report (DEER) can be used in lieu of PSR-PDS, PSR-PR, and Project Report if the project meets all the following conditions:

- Project has approved environmental document (CE, ND, EIR, EIS, etc.) or project is CE by CEQA and/or NEPA and has completed studies or public outreach.
- Project only has a Single-Build Alternative
- Project does not require CTC action
- Project doesn't involve any ROW conveyances from the Department to the local agencies (e.g. dedications, relinquishments, modifications to State ROW limits, etc.)
- Project doesn't require FHWA approval for Relinquishments or NPRCs involving a modification to the access control
- Project doesn't involve construction of new structures or bridge widenings.

The DEER application checklist is included in the Appendix I and the DEER Template is added to the Caltrans Electronic Forms System (CEFS).

Appendix I

Design Engineering Evaluation Report Application Checklist

This checklist is used to determine whether a Design Engineering Evaluation Report (DEER) can be used for project approval of encroachment projects on the State Highway System.

No.	Scope Criteria	Yes	No
1	Project has approved environmental document (CE, ND, EIR, EIS, etc.) or project is CE by CEQA and/or NEPA and has completed studies or public outreach.		
2	Project only has a Single-Build Alternative.		
3	Project does not require CTC action.		
4	Project doesn't involve any ROW conveyances from the Department to the local agencies (e.g. dedications, relinquishments, modifications to State ROW limits, etc.).		
5	Project doesn't require FHWA approval for Relinquishments or NPRCs involving a modification to the access control.		
6	Project doesn't involve construction of new structures or bridge widenings.		

If the answer is "Yes" to all of six criteria, the project can use the DEER for project approval.

Abbreviations:

1. **CE:** Categorical Exemption/Categorical Exclusion
2. **CEQA:** California Environmental Quality Act
3. **EIR:** Environmental Impact Report
4. **EIS:** Environmental Impact Statement
5. **ND:** Negative Declaration
6. **NEPA:** National Environmental Policy Act
7. **CTC:** California Transportation Commission
8. **FHWA:** Federal Highway Administration
9. **NPRC:** New Public Road Connection
10. **ROW:** Right-of-way

Questions & Comments:
Audrey Harris at aharris2@oaklandca.gov

Project Website:
<https://www.oaklandca.gov/projects/walk-this-way>

Client

City of Oakland
Department of Transportation



City of
Oakland | Department of
Transportation

Project Team

PGAdesign | Landscape Architects
BKF Engineers | Civil Engineers
HLB Lighting | Lighting Design
Salter Acoustics | Acoustic Engineers

PGAdesign
LANDSCAPE
ARCHITECTS

Project Sponsor

Metropolitan Transportation
Commission

