City of Oakland
Department of Transportation

Oakland Walks!

2017 Pedestrian Plan Update

City of Oakland | Department of Transportation

The Vision of the 2017 Pedestrian Plan

The vision of the 2017 Pedestrian Plan Update is to make Oakland a walker's paradise: Oakland will be a place where vibrant, safe and attractive streets give everyone the opportunity to have convenient and healthy walks to places that serve both every day needs and offer access to Oakland's multiple and amazing places, including parks, the waterfront, and cultural destinations.

About this Plan

The Plan is aspirational. It sets goals, outlines related policies and programs, and establishes a prioritization strategy to implement recommendations that will improve our pedestrian environment over the next five years and beyond.

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Cover: Kerby Olsen

What is a Pedestrian?

According to California Vehicle Code Section 467:

"(a) A pedestrian is any person who is a foot or who is using a means of conveyance propelled by human power other than a bicycle.

(b) "Pedestrian" includes any person who is operating a self-propelled wheelchair, motorized tricycle, or motorized quadricycle and, by reason of physical disability, is otherwise unable to move about as a pedestrian, as specified in subdivision (a)."

Kerby Olsen

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Improving the walking environment in Oakland is important. Walking is one of the most efficient and affordable methods of getting Oaklanders to school, work, transit, and shopping. And creating a vibrant, connected pedestrian network can boost economic activity, improve safety and sustainability, and support neighborhood vitality.

At the same time, improving walking in Oakland means addressing safety. In Oakland, 48 people were killed or injured while walking between 2008-2014 in collisions that steal the lives, the loved ones, and the livelihoods of Oaklanders.

This Plan also considers equity, because these crashes did not occur evenly across Oakland: they were concentrated in the city's low income, most racially diverse neighborhoods, where more people rely on walking to transit than anywhere else

Oakland will be a place where vibrant, safe, and attractive streets give everyone the opportunity to walk to their destinations and to enjoy the convenience and health benefits of walking.

Oakland Public Library, 2016

2017 Pedestrian Plan Update

in Oakland. These streets are on Oakland's High Injury Network, and represent just 2% of streets where 36% of pedestrian-involved collisions are concentrated.

This Plan outlines an action plan to invest in and improve safety in the High Injury Network and to implement the key policy and programmatic improvements that will make streets safer and more inviting for walking throughout the city. The Plan intends to help make areas that have few services, or may need additional every day services, accessible to local communities. This will not only provide accessibility, but increase the vibrancy of destinations. A robust community engagement effort will be needed to make sure improvements are made to support this type of action wherever possible.

This is why the Plan identifies a targeted set of improvements that can be accomplished in 5 years (Chapter 5: Recommended Actions).

The vision of this Pedestrian Plan is aspirational. City of Oakland staff will work with affected communities to hear their ideas and meet their needs as much as possible when working to improve the pedestrian environment. The vision was developed by listening to residents at community meetings, as well as professionals who served on our Technical Advisory Committee (TAC) and Pedestrian Advisory Group (PAG) in Oakland (see Acknowledgements for a list of members).

In addition to this community engagement, the Plan was informed by extensive data analysis and an assessment of other cities' best practices. It sets an ambitious goal for Oakland and paints a picture of what can be achieved over the next five years and beyond, assuming adequate resources.

Oakland's Department of Race and Equity

The Department of Race and Equity, created in 2015 by a city ordinance, recognizes the existence of systematic racial disparities. Additionally, the ordinance states that it is time for the City to start addressing these underlying inequities. The Department is tasked with "integrating, on a city-wide basis, the principle of ensuring that Oakland is a 'fair and just' City, by eliminating systemic inequities caused by past and current decisions, systems of power and privilege, and policies."

One past decision with particular relevance to Oakland's Communities of Concern is the practice of "redlining." Redlining is most closely associated with the Home Owners' Loan Corporation (HOLC). HOLC was a federal program developed by the Federal Housing Administration (FHA) to address home ownership during the Great Depression, and continued until the mid-1960s. The HOLC was instructed by FHA to determine home loan investment risk in cities across the US. To do this, HOLC developed a set of maps grading neighborhoods from high risk to low, based on input from local real estate agents and lenders. This input was often based on judgments of neighborhoods solely on their racial and socioeconomic makeup—and not a history of loan default. Neighborhoods where people of color or immigrants lived were rated highest risk in the HOLC maps and colored red.

(continued on page 7)

Oakland's Department of Race and Equity

(continued.) These maps were in turn used by banks to deny loans to potential buyers seeking to live in "redlined" neighborhoods. Importantly, this meant that loans backed by the federal government that effectively subsidized private housing for millions of Americans in the 1940s were not available to anyone living in these neighborhoods.

This policy and practice prevented the accumulation of home equity for people of color and prevented investment in Black, immigrant, and/or low-income communities. This lack of investment can be seen today in Oakland's Communities of Concern.

Oakland's "Communities of Concern," a metric created by the Metropolitan Transportation Commission to identify areas with concentrations of residents who face potential disadvantages and barriers to mobility. is similar to the Redline map of Oakland. To learn more about the Communities of Concern metric, see Map 3.2.

Oakland Public Library

Needed Investment and Funding Constraints

In Oakland, almost all funding for transportation comes from outside sources and is split into two key categories:

- **Capital Funds**: These funds are for construction projects, like building new sidewalks or repaving streets. Our main capital fund sources are the 2016 Infrastructure Bond, various outside grants, and the county transportation sales taxes, Measures B and BB.
- **Operating Funds**: These funds are used for staff and maintenance, like fixing potholes, painting crosswalks, and running pedestrian safety programs. Historically, street and sidewalk maintenance was covered by state and federal gas taxes, but these sources have been steadily declining, offset by an increasing share paid by Measures B and BB. In Oakland, sidewalk repair is largely the responsibility of adjacent property owners.

Although the Infrastructure Bond (Measure KK) will not allow Oakland to bring all of its streets into a state of good repair, its passage means that the City has more flexibility in its capital budget than its operating budget. As we repave our streets, we create opportunities to redesign those streets to be safer for pedestrians. Operating dollars, on the other hand, are extremely scarce, contributing to a structural deferred maintenance problem for the City.

New programs that benefit pedestrians directly compete against street maintenance. Given Oakland's funding constraints, many of the recommendations in this Plan seek to remove obstacles to good pedestrian design, reallocate funding in more productive ways, and enter into partnerships with funders and service providers.

What we learned about **walking** in Oakland

We looked at seven years of police collision data, the most recent census data, City records, public health studies and the results of our survey. These findings are the highlights of this analysis.

Existing Conditions

27% 27% of all trips in Oakland are made by walking.

78% 78% of trips to public transit are made on foot.

1,120 Oakland has 1,120 miles of sidewalk.

31 and 31 miles of sidewalk gaps.

3x Asian Americans in Oakland are more than 3x as likely to be killed by a motorist while walking than whites.

Safety Analysis

267 Each year in Oakland, an average of 267 pedestrians are injured in motor vehicle collisions.

7 On average, 7 pedestrians are killed each year in motor vehicle collisions.

36% 36% of pedestrian injuries and deaths happen on...

2% ...just 2% of Oakland's streets.

62% Motorists are at fault for 62% of collisions with pedestrians.

Community Outreach

588 Almost 600 Oaklanders responded to our online survey about pedestrian conditions and potential improvements.

7 We attended meetings across Oakland and asked community and neighborhood groups for input.

4 We met four times with the Plan's Pedestrian Advisory Group and Technical Advisory Group, to receive and apply their input.

Kerby Olsen

Chapter Summaries

Chapter 1: Policy Framework

The Policy Framework reflects the vision of city residents and workers to improve pedestrian safety and health in Oakland. It sets the overall vision of the Plan, followed by four goals, five outcomes, and thirty-eight specific actions that implement the Plan.

Chapter 2. Safety

The Safety chapter describes Oakland's recent history of pedestrian injuries and deaths caused by collisions with motor vehicles. City staff analyzed seven years of collision history, identified in police reports, in order to identify the City's High Injury Network.

Chapter 3. Existing Conditions

This chapter describes Oakland's pedestrian facilities and walking conditions and includes a discussion of the city's demographics, both as a whole and by area. The Plan's four goals and five outcomes are each informed by data from this chapter.

Chapter 4. Needs Analysis

The Needs Analysis identifies the gap between where Oakland is now and where it needs to be. Policy, planning, and program needs were identified through Plan analysis, the Plan's community engagement process, and an analysis of the city's overall walkability.

Chapter 5. Recommended Actions

This chapter answers the question of how the City can make streets safer, more comfortable, and more convenient for people walking throughout all parts of Oakland. It presents a set of 39 recommended actions, each intended to help accomplish one or more of the Plan's four goals.

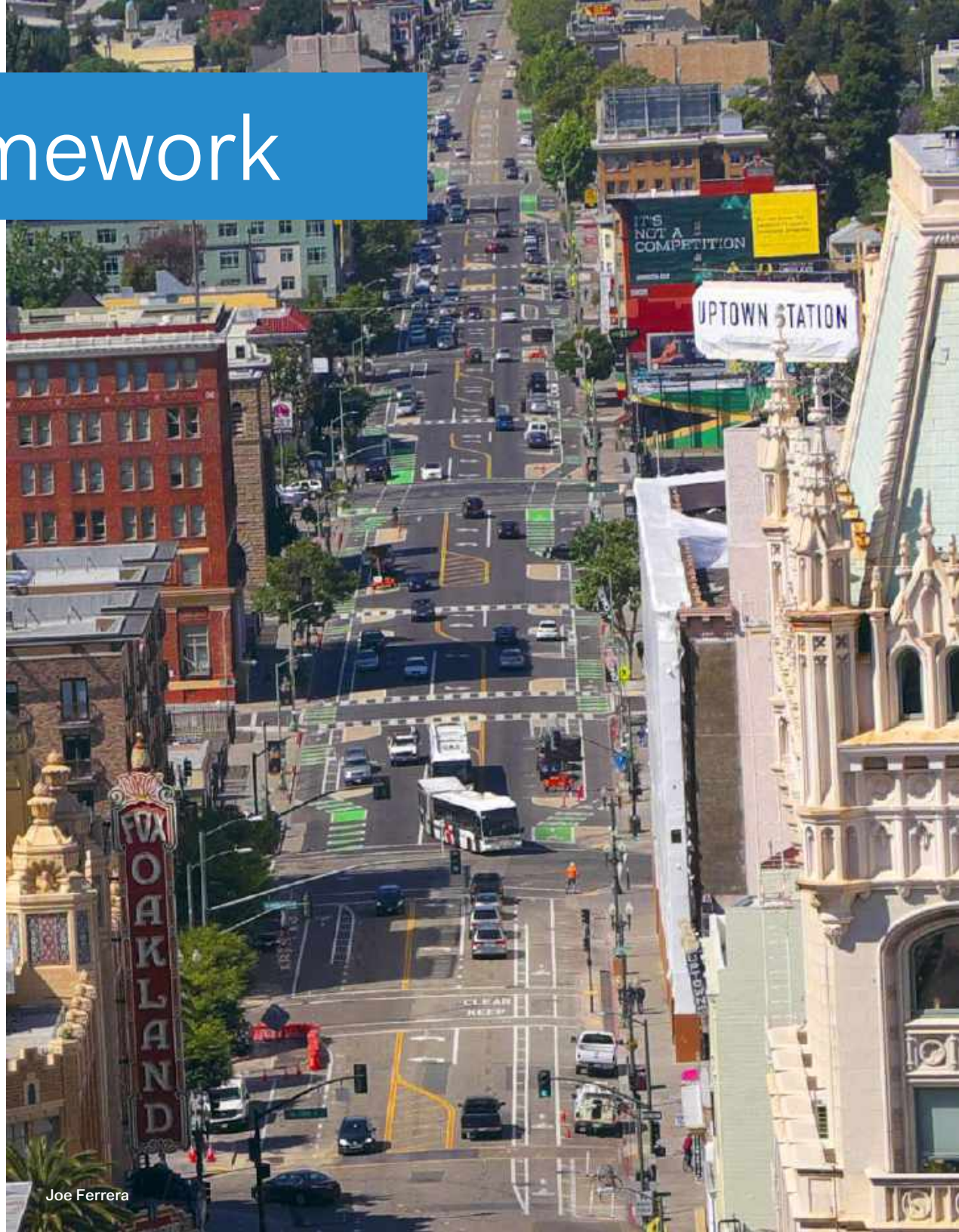
Chapter 6. Prioritizing Improvements

Implementing the improvements identified in this Plan has been estimated to cost more than 100 million dollars over five years. Given this large investment of City resources, this Plan proposes to first invest in the areas of the city most in need of improvements to the pedestrian environment, and focuses the investments on high injury corridors and intersections. There are three analyses used in this Plan to identify areas of highest need: a safety analysis, equity analysis, and walkability analysis.

Kerby Olsen

1. Policy Framework

This chapter describes the background and policy framework of the Plan. The framework is composed of an overarching vision, four goals, five objectives,and thirty-nine recommended actions.



Joe Ferrera

The City's previous Pedestrian Plan (California's first!) was written in 2002. In the intervening decade-and-a-half, many significant changes to planning in the walking realm have taken place in Oakland, including:

- Design improvements to pedestrian facilities.
- Local success repurposing excess traffic lanes for walking, such as Lake Merritt Boulevard.
- Three dozen road diets, which converted roadway space to make walking and bicycling safer.
- New standards for curb ramps and other facilities for people with disabilities.
- New technology which may lead to less need to own a car.

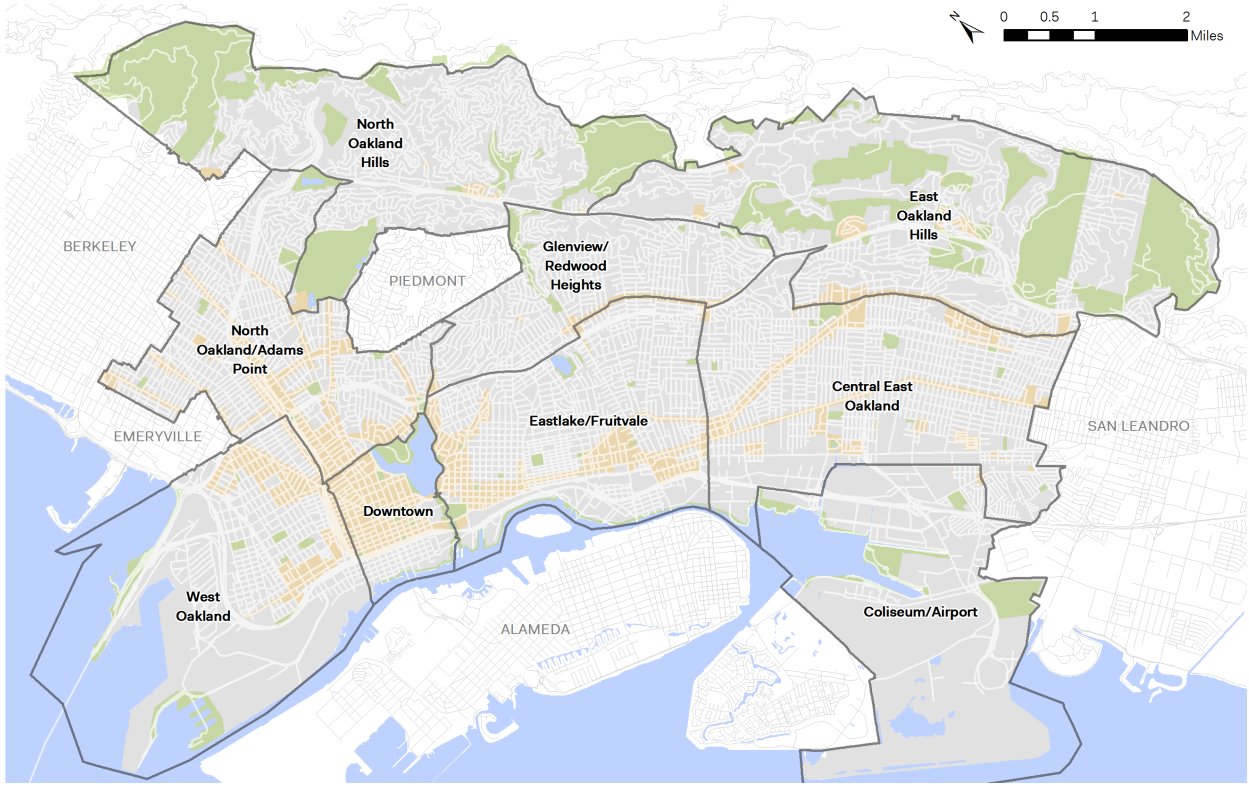
As this Plan was in development, the Oakland Department of Transportation (OakDOT) was created in 2016. The new OakDOT will centralize the responsibility for managing and improving how people get around on Oakland's city streets, sidewalks, highways, and bridges.

The Department's mission underscores that the quality of transportation options shouldn't hinge on who you are, how much you earn, or where you live in Oakland.

In order to achieve this mission, this Plan deliberately defines and prioritizes social equity in its decision-making.

In addition, this Plan builds on other City and Regional plans and local policies, including Oakland's Complete Streets Policy, Area Specific Plans, the Energy and Climate Action Plan, and crosswalk policies.

Map 1.1: Oakland's Nine Plan Areas



A full list of supporting and related documents, with descriptions can be found in Appendix A.

Policy Framework

The following graphic outlines how the Plan's organization. The vision, goals, and actions provide the foundation of the Plan. Each action is evaluated by one or more of the four goals.

Vision
The desired outcome from the 2017 Pedestrian Plan.

Goals
Four goals outline how Oakland will achieve the Plan's vision (p.13).

Outcomes
Five outcomes guide the Plan's implementation and are accompanied by discrete action items (p.14).

Recommended Actions
Actions the City will take to meet the objectives which are evaluated by the four goals (pg. 56).

This Plan establishes the following four goals for pedestrians in Oakland

S Holistic Community Safety

Make Oakland's pedestrian environment safe and welcoming.

Eighteen hundred people were injured or killed by motor vehicles on Oakland streets between 2008 and 2014. Chapter 2 outlines the city's pedestrian collision history, primary factors for collisions, and high injury corridors and intersections. Appendix B details how the City will improve safety on its highest injury corridors, and Appendix C provides a "safety toolkit" for improving the safety of streets, sidewalks and crossings.

E Equity

Recognizing a historical pattern of disinvestment, focus investment and resources to create equitable, accessible walking conditions to meet the needs of Oakland's diverse communities.

As documented in the Existing Conditions chapter, areas of Oakland with high numbers of pedestrian collisions tend to overlap with transit- and walking-dependent populations, and populations that are especially vulnerable to poor walking conditions, such as senior citizens, children and people with disabilities. These areas, which include West Oakland, Central East Oakland, Downtown, Eastlake/Fruitvale and Coliseum/Airport, are also home to some of the city's most inhospitable and inaccessible streets for walking.

R Responsiveness

Develop and provide tools to ensure that Oakland creates and maintains a vibrant pedestrian environment.

To create and maintain a vibrant pedestrian environment, the City will work to improve data collection and ensure staff is trained in national best practices for safe street design and management. Additionally, City staff will work to ensure that safety data is easily accessible to the public and will create publicly accessible tools so that communities can identify neighborhood-specific pedestrian safety strategies.

V Vitality

Ensure that Oakland's pedestrian environment is welcoming, well connected, supports the local economy, and sustains healthy communities.

Walking on a regular basis has several health benefits and may reduce the prevalence of chronic diseases such as heart disease, cancer or diabetes. Reducing or even eliminating traffic collisions on Oakland streets will make walking more inviting, but better design and more investment is needed to make walking the most attractive way to travel, both for people with transportation options and those without. Pedestrians embarking on a trip should be able to reach a variety of destinations including transit, work, school, retail, and open space without detours, delays or danger.

This Plan establishes the following five outcomes for pedestrians in Oakland

Outcome 1:
Increase Pedestrian Safety

In order to achieve this objective, the City will install near term and long term pedestrian safety improvements in the High Injury Network, develop new policies, adopt Vision Zero, upgrade signals and other infrastructure, reduce vehicle speeds, improve lighting, and explore ways to equitably enforce traffic laws.

Outcome 2:
Create Streets and Places that Promote Walking

To achieve this objective, the City will integrate safety into the design of new streets, incorporate art into pedestrian infrastructure, plant more street trees, repair sidewalks, install accessible curb ramps, and provide public open space in underutilized roadways. The City will also pursue citywide programs and partnerships with nonprofits and community groups to promote walking.

Outcome 3:
Improve Walkability to Key Destinations

Oaklanders should be able to walk safely to transit, schools, jobs, and other major destinations. To achieve this objective, the City will, where possible, improve sidewalk connections and wayfinding signage to these destinations. The City will use Walk Score® to improve walkability to key destinations.

Outcome 4:
Engage the Oakland Community in Creating Vibrant Pedestrian Environments

It is essential that the City hears from many different communities in Oakland while this Plan is being implemented. In order to ensure the Plan's success, the City will partner with neighborhood groups, use new and old media, develop a comprehensive safety education campaign, and support community-led initiatives related to creating more vibrant pedestrian environments.

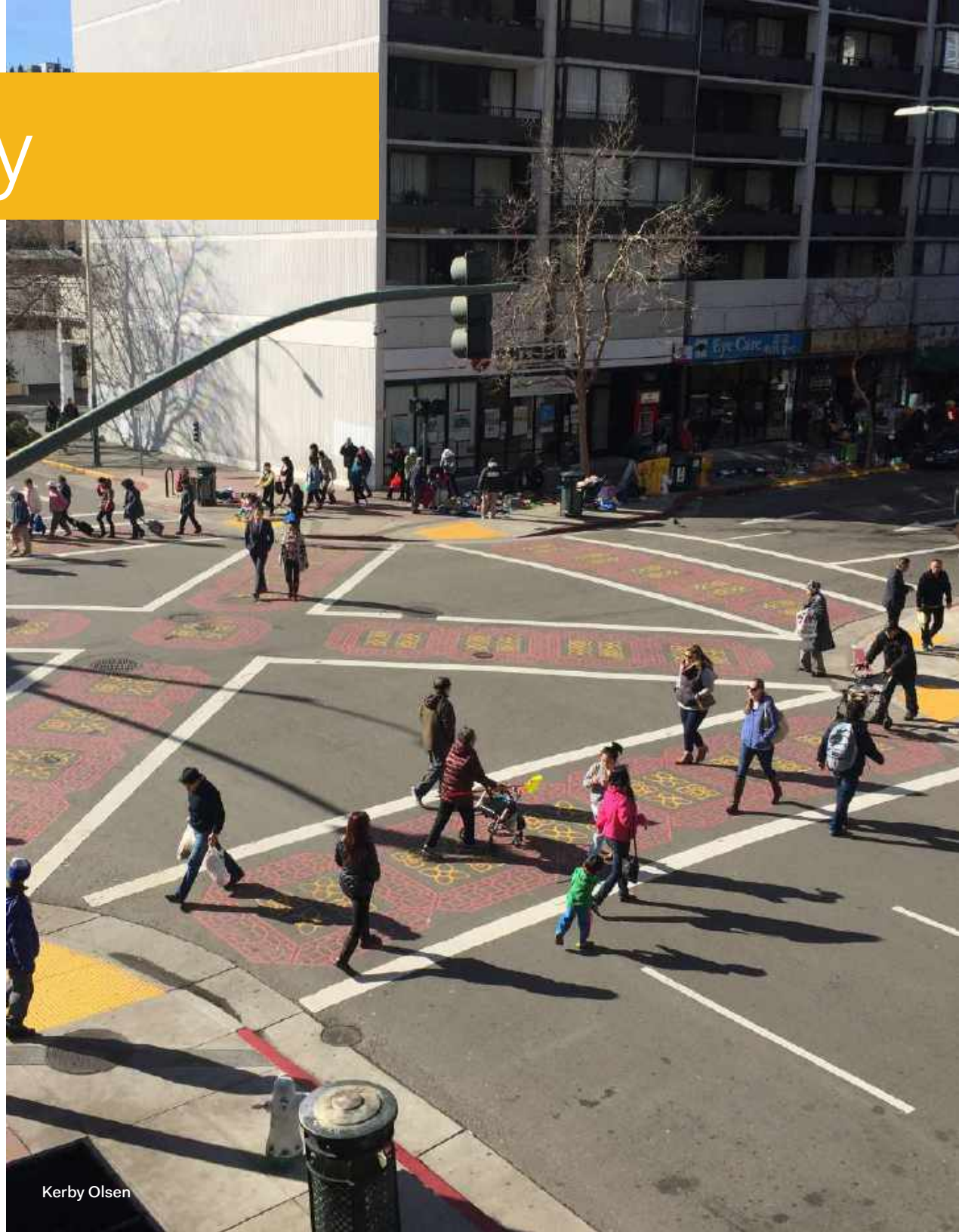
Outcome 5:

Improve Metrics, Evaluations, Funding, and Tools for Creating Pedestrian Environments

In order to achieve this objective, the City must collect data that is robust, up to date, and measured consistently. This data and associated metrics will allow the City to measure its current needs and also provide much-needed information to anticipate future investment in the pedestrian environment. The City will update its current data, conduct before-and-after evaluations, create a central transportation data inventory, develop quantitative equity metrics, conduct routine pedestrian counts, and critically examine and improve how it responds to complaints.

2. Safety

This chapter describes Oakland's recent history of pedestrian injuries and deaths caused by collisions with motor vehicles. City staff analyzed seven years of collision reports in order to identify the most dangerous streets and intersections for people walking.



Kerby Olsen

2.1 Safety Trends

Traffic collisions are a chronic hazard to the health and safety of people walking in Oakland. Over 1,800 fatal and injury-causing collisions involving motor vehicles and pedestrians occurred in Oakland between 2008 and 2014. This is an average of approximately 267 collisions annually (see Table 2.1). This number represents about 10% of all motor vehicle collisions in Oakland.[1] Forty-eight pedestrians were killed by collisions with a motor vehicle in Oakland during this seven-year period, an average of about seven people per year, and 151 (22 annually) were severely injured. While 452 individuals suffered visible injuries, another 1,210 had a complaint of pain or injury. The vast majority of these deaths and severe injuries were preventable, and resulted from a combination of poorly designed streets and human error. Oakland's pedestrian fatality rate of 1.70 deaths per 100,000 people is higher than the national average of 1.47, but lower than the California average of 1.74.[2]

Furthermore, these crashes did not occur evenly across Oakland: they were concentrated in the city's poorest, most racially diverse neighborhoods, where more people rely on walking, and walking to transit, than elsewhere in Oakland (see Table 2.4).

Table 2.1: Fatal and Injury Pedestrian Collisions by Year (2008-2014)

Severity	2008	2009	2010	2011	2012	2013	2014	Total	Avg/Yr
Fatal	10	5	7	2	10	4	10	48	6.9
Severe Injury	20	24	16	19	19	18	35	151	22
Other Visible Injury	71	49	64	60	78	63	67	452	65
Complaint of Pain Injury	179	166	192	186	176	161	150	1,210	173
Total	280	244	279	267	283	246	262	1,861	266

Source: California Highway Patrol. (2017). The Statewide Integrated Traffic Records System (SWITRS)(database query).

The High Injury Network

Thirty-six percent of pedestrian collisions in Oakland happen on just 2% of our streets. Together, these most dangerous streets are known as the City's "High Injury Network." This network of high-injury corridors and intersections was identified by analyzing seven years pedestrian crashes (2008-2014) as well as the physical characteristics of the roadway. This analysis identified 34 high-injury corridors and 37 high-injury intersections (see Table 2.2).

Fixes to the High Injury Network have the potential to greatly improve pedestrian safety. "Chapter 6: Prioritizing Improvements" details how the City will invest in these intersections and corridors.

Primary Collision Factors

When police officers investigate a collision, they record their judgment of the crash's "Primary Collision Factor" (PCF) in a crash report. According to these reports, most pedestrian collisions in Oakland in the past five years have resulted from preventable motorist behavior such as speeding (a factor in 19% of fatal or severe collisions) or driving under the influence of alcohol or drugs (41% of fatal or severe collisions).

1. This figure does not include crashes that took place on highways, whose exact location is unknown or that were reported as "Property Damage Only" (PDO).

2. Dangerous by Design. (2016). Smart Growth America. Retrieved from https://smartgrowthamerica.org/dangerous-by-design/

Table 2.2: High Injury Network (2008-2014) by Plan Area

Corridors

Street	Begins	Ends	Plan Area
12th St	Jefferson St	Oak St	Downtown
14th St	Myrtle St	Oak St	Downtown
E 15th St	21st Ave	26th Ave	Eastlake/Fruitvale
7th St	Washington St	7th St Bridge	Downtown
8th St	Franklin St	Fallon St	Downtown
94th Ave	Cherry St	Burr St	Central East Oakland
98th Ave	A St	MacArthur Blvd	Central East Oakland
9th St	Franklin St	Fallon St	Downtown
Bancroft Ave	84th Ave	98th Ave	Central East Oakland
Bancroft Ave	Church St	80th Ave	Central East Oakland
Bancroft Ave	Church St	Havenscourt Blvd	Central East Oakland
Broadway	9th St	19th St	Downtown
Foothill Blvd	Mitchell St	40th Ave	Eastlake/Fruitvale
Foothill Blvd	51st Ave	Seminary Ave	Central East Oakland
Fruitvale Ave	Alameda Ave	E 16th St	Eastlake/Fruitvale
Grand Ave	Lake Park Ave	Oakland Ave	North Oakland
Grand Ave	Valley St	El Embarcadero	Downtown

Corridors

Street	Begins	Ends	Plan Area
Hegenberger Rd	Hegenberger Lp	Hegenberger Pl	Coliseum/Airport
High St	Lyon	Kansas St	Eastlake/Fruitvale
International Blvd	High	56th Ave	Central East Oakland
International Blvd	16th Ave	28th Ave	Eastlake/Fruitvale
International Blvd	73rd Ave	91st Ave	Central East Oakland
International Blvd	1st Ave	12th Ave	Eastlake/Fruitvale
International Blvd	95th Ave	Durant Ave	Central East Oakland
International Blvd	High St	Fruitvale Ave	Eastlake/Fruitvale
MacArthur Blvd	Foothill	82nd Ave	Central East Oakland
Martin Luther King Jr Way	40th St	44th St	North Oakland/Adams Point
Martin Luther King Jr Way	29th St	40th St	West Oakland
Piedmont Ave	Warren Ave	Entrada Ave	North Oakland/Adams Point
Shattuck Ave	45th St	55th St	North Oakland/Adams Point
Telegraph Ave	William	27th St	North Oakland/Adams Point
Telegraph Ave	30th St	51st St	North Oakland/Adams Point
Telegraph Ave	William St	Broadway	Downtown
Telegraph Ave	51st St	Sr 24	North Oakland/Adams Point

Intersections

Street	Cross Street	Plan Area
12th St	Brush St	West Oakland
14th St	Market St	West Oakland
21st Ave	International Blvd	Eastlake/Fruitvale
24th St	Broadway	Downtown
27th St	Broadway	Downtown
29th St	Telegraph Ave	North Oakland/Adams Point
33rd Ave	Foothill Blvd	Eastlake/Fruitvale
34th St	Martin Luther King Jr Way	West Oakland
34th St	San Pablo Ave	West Oakland
35th Ave	International Blvd	Eastlake/Fruitvale
37th St	Telegraph Ave	North Oakland/Adams Point
48th St	Telegraph Ave	North Oakland/Adams Point
51st St	Telegraph Ave	North Oakland/Adams Point

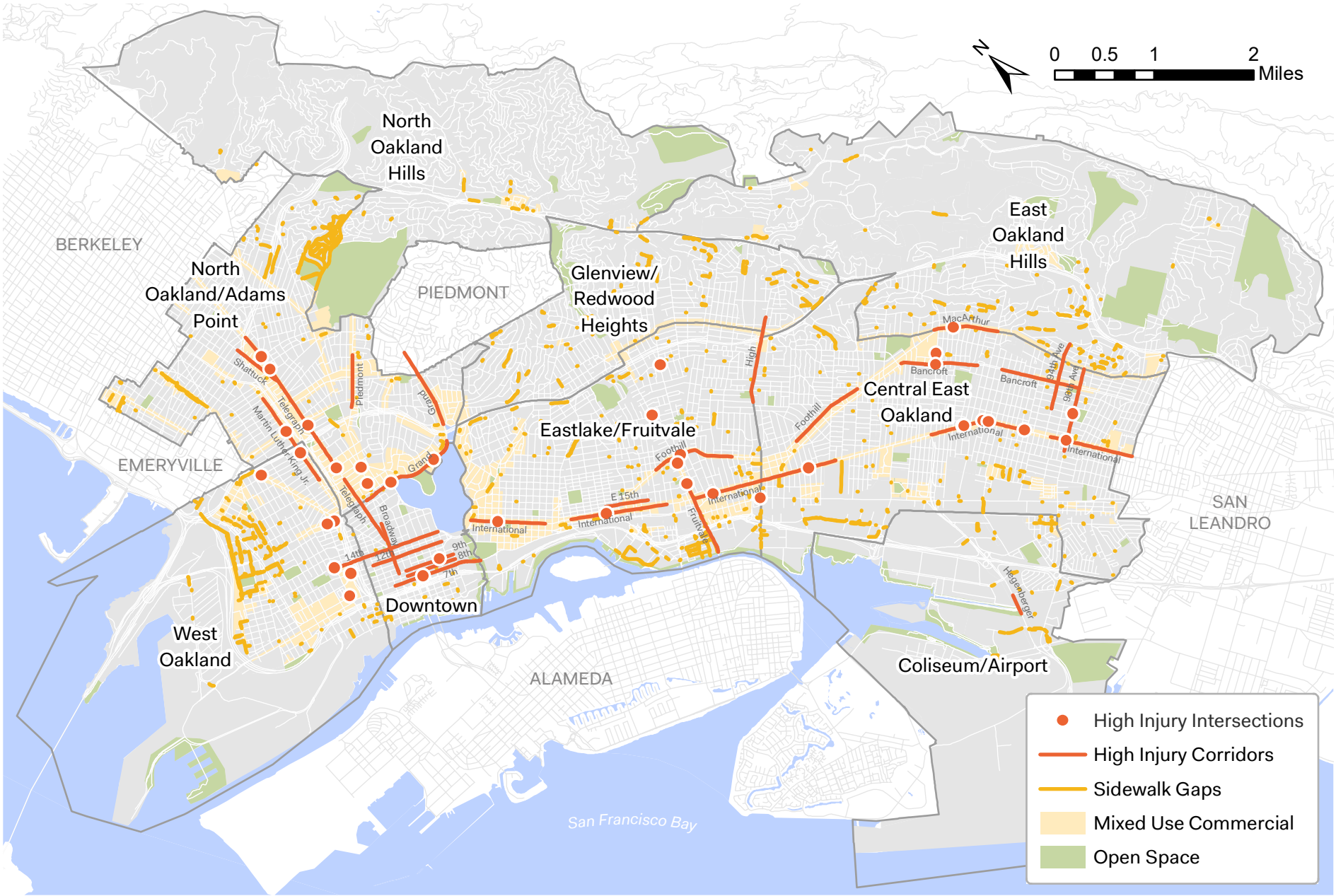
Intersections

Street	Cross Street	Plan Area
52nd Ave	International Blvd	Central/East Oakland
5th Ave	International Blvd	Eastlake/Fruitvale
73rd Ave	Bancroft Ave	Central/East Oakland
73rd Ave	Garfield Ave	Central/East Oakland
76th Ave	MacArthur Blvd	East Oakland Hills
7th St	Harrison St	Downtown
80th Ave	International Blvd	Central/East Oakland
83rd Ave	International Blvd	Central/East Oakland
84th Ave	International Blvd	Central/East Oakland
8th St	Market St	West Oakland
90th Ave	International Blvd	Central/East Oakland
98th Ave	Cherry St	Central/East Oakland
98th Ave	International Blvd	Central/East Oakland

Intersections

Street	Cross Street	Plan Area
9th St	Madison St	Downtown
Brush St	W Grand Ave	West Oakland
Coolidge Ave	School St	Eastlake/Fruitvale
E 16th St	Fruitvale Ave	Eastlake/Fruitvale
E 19th St	Fruitvale Ave	Eastlake/Fruitvale
E 27th St	Fruitvale Ave	Eastlake/Fruitvale
Grand Ave	Harrison St	Downtown
Grand Ave	Staten Ave	North Oakland/Adams Point
High St	San Leandro St	Eastlake/Fruitvale
MacArthur Blvd	Martin Luther King Jr Way	West Oakland
San Pablo Ave	W Grand Ave	West Oakland

Map 2.1: High Injury Network (2008-2014)



Primary Collision Factors (continued)

Many pedestrian collisions also occur when a driver violates a pedestrian's right-of-way, such as striking a person crossing a street during a walk signal.

Motorist violation of pedestrian right-of-way was a primary collision factor in 46% of collisions with pedestrians. Careless driving, unsafe speed and improper turning were cited as the PCF in 16% of reported crashes.

Overall, this indicates that 62% of reported pedestrian-vehicle collisions were the motorist's fault.

After alcohol or drug use, officers cited unsafe speeds as the most common PCF in collisions that resulted in fatal or severe injuries.

This finding is consistent with research published by the National Highway Traffic Safety Administration (NHTSA) showing that 5% of pedestrians are killed when struck by a vehicle traveling at 20 miles per hour or less compared to fatality rates of 40, 80 and nearly 100% if struck by a vehicle going 30, 40 and 50 mph or more, respectively.

See Table 2.3 for a listing of the top Oakland corridors (for which speed surveys exist) showing where 85% or more of traffic is traveling above the speed limit.

Pedestrian Collisions by Race

Oakland is the most racially diverse city in America,[3,4] with an overall population that is 74% non-white and approximately equal proportions of white, African American and Hispanic/Latino residents. Nonetheless, racial and ethnic traffic fatalities varies greatly, as in Table 2.4).

Studies show a strong relationship between race and the likelihood of being killed by a vehicle as a pedestrian.[5]

Table 2.3: High Speed Traffic Locations

Street	Start	End	Plan Area
Bancroft Ave	84th Ave	98th Ave	Central East Oakland
Bancroft Ave	Church St	80th Ave	Central East Oakland
Foothill Blvd	51st Ave	Seminary Ave	Central East Oakland
Foothill Blvd	Mitchell St	40th Ave	Eastlake/Fruitvale
Grand Ave	Valley St	El Embarcadero	Downtown
Grand Ave	Lake Park	Oakland Ave	North Oakland
International Blvd	16th Avenue	28th Ave	Eastlake/Fruitvale
McArthur Blvd	Foothill Blvd	82nd Ave	Central East Oakland
Shattuck Ave	45th Street	55th St	North Oakland/Adams Point

Dangerous By Design

In addition to human factors, the following physical characteristics of the roadway network have been found to be common across the high-priority collision locations (listed in no particular order).

- More than four traffic lanes (two or more each way) with no median
- No pedestrian signal or countdown signal
- No pedestrian call button
- Offset or closely spaced intersections (within 80-150 feet of one another)
- One or more bus stops

A 2015 study* of 42 high-collision intersections in Oakland identified additional characteristics that are associated with a high risk of pedestrian collisions, including:

- Parallel curb parking with a daylighting (restriction of parking near an intersection) distance of less than 15 feet
- Having at least one intersection approach without a marked crosswalk
- Having an average curb to curb street crossing distance of greater than 66 feet

* Blackston, Christina, Safety Dance: An Analysis of Characteristics of Oakland's High Pedestrian-Collision Intersections (Client Report: University of California, Berkeley, Master of City Planning, 2015).

Table 2.4: Traffic Fatalities By Race (2010-2014)

Race or Ethnicity	Fatalities (#)	Fatalities (%)	Population	Population (%)	Fatality Rate per 100,000 pop.
Asian	11	31%	66,088	16%	16.6
Black	9	25%	102,933	26%	8.7
Hispanic/ Latino	10	28%	104,122	26%	9.6
White	5	14%	106,736	27%	4.7
Other	1	3%	22,460	6%	4.5
Total	36	100%	402,339		8.9

Source: Fatality Analysis Reporting System (FARS) https://www-fars.nhtsa.dot.gov/Main/index.aspx*

The Centers for Disease Control found that nationwide, African American and Hispanic people have twice the likelihood of being killed in a pedestrian collision as people of other races and ethnicities.[5]

At the statewide level, Asian/Pacific Islanders 65 years and older have the highest death and hospitalization rates of any age group. Locally, Table 2.4 shows that pedestrians in Oakland of Asian descent die at twice the citywide rate. The Black and Hispanic populations in Oakland are almost twice as likely to die in a pedestrian collision as white populations. This data reflects that in Oakland, as in many American communities, people of color often live and walk in particular areas of the city where walking conditions may be less safe.

*Note: The data regarding traffic fatalities is not always accurate and could be underreporting traffic fatalities by race. Additionally, a study completed by the San Francisco Department of Public Health analyzed data from San Francisco General Hospital and found that patients who were admitted with severe injuries due to a transportation related collision outnumbered the data reported by the San Francisco Police Department. The data, analyzed from April 1, 2014 to March 31, 2105, showed that 515 patients with severe injuries were admitted for traffic related incidents, as compared to 200 SFPD reports that cited severe injuries. There are several reasons that could lead to underreporting, including police officers who are not trained medical professionals, highway collisions which are outside the jurisdiction of SFPD, and simply not reporting injuries to the police. The data indicates that police reports should not be the sole source for assessing traffic injuries.[6]

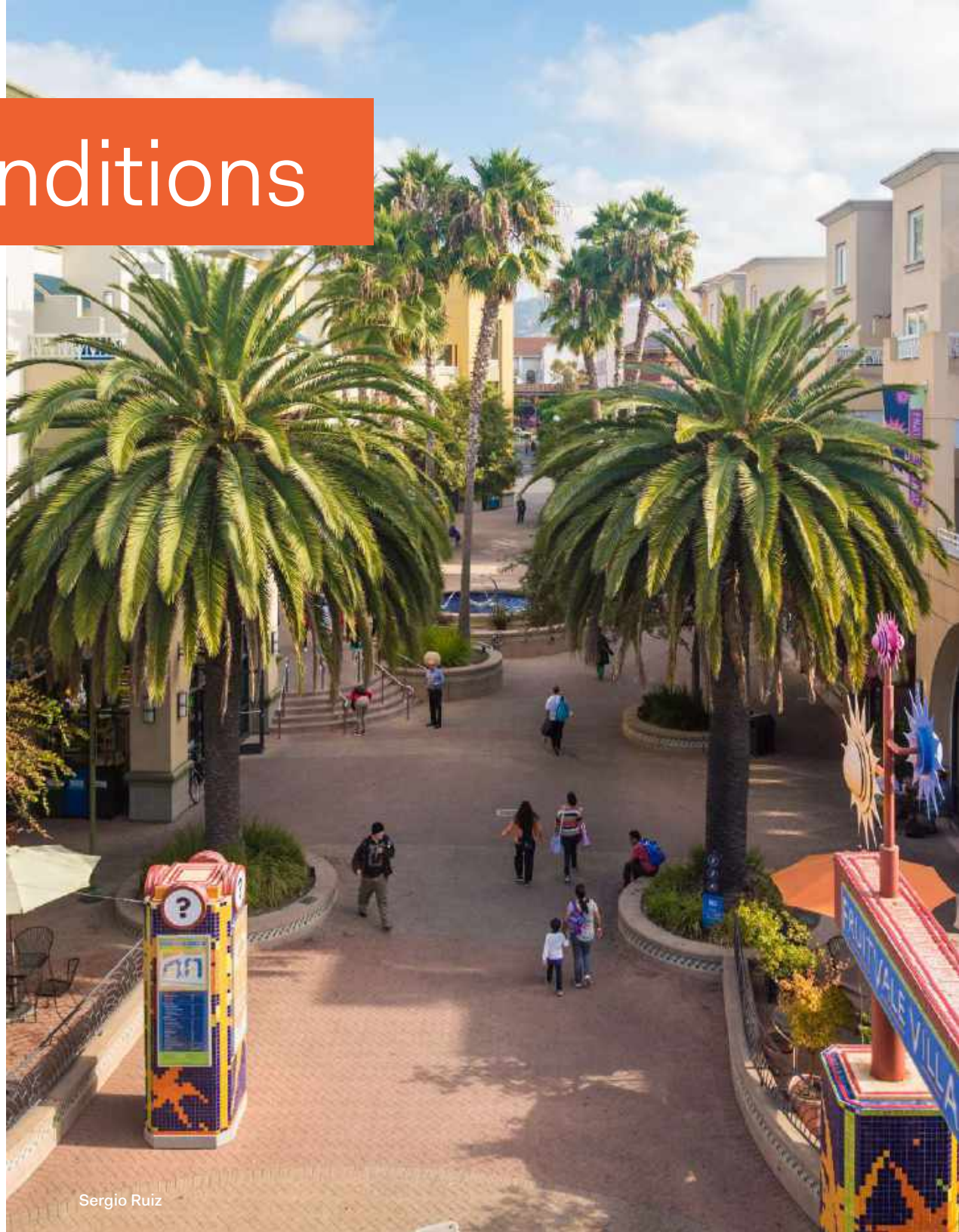
3, 4. Cima, Rosie. (2015). Priceonomics; data via American Community Survey 2013.

5. Centers for Disease Control. (2013). Motor Vehicle Traffic-Related Pedestrian Deaths — United States, 2001–2010.

6. Vision Zero SF: http://sf.streetsblog.org/wp-content/uploads/sites/3/2015/09/SevereInjuriesSF_2014_15_PSAC.pdf

3. Existing Conditions

This chapter describes Oakland's pedestrian facilities and walking conditions and includes a discussion of the City's demographics, both as a whole and by area. In addition, the City's programs and policies related to pedestrians are described here. The Plan's four goals and five outcomes are each informed by data from this chapter.



Sergio Ruiz

3.1 Citywide Trends

Walking Rates

27% of all trips in Oakland are made on foot, more than any other travel mode but driving (see Table 3.1). This includes walking trips to a destination, to another travel mode (such as public transit), and for recreation or exercise.

Oakland's walking rate is significantly higher than the statewide average of 17%. Among cities of similar size, Oakland's walking rate is higher than Long Beach (15%) and Sacramento (11%), but lower than San Francisco (44%) (see Table 3.1).

Table 3.1: Oakland Travel Mode Share

City of Oakland	
Travel Mode	**% of all trips**
Automobile	56%
Walk	27%
Transit	13%
Bicycle	2%
Comparable California Cities	
City	**% of walk trips**
San Francisco	44%
Oakland	27%
Long Beach	15%
Sacramento	11%
Statewide average	17%

Source: California Household Travel Survey, Caltrans, 2013

Car Ownership

Approximately 17% of Oakland households do not have a car, lower than Berkeley (21%) and San Francisco (30%), but higher than Alameda County (10%).

Table 3.2: Car Ownership

Geographic area	Zero car households	
	2005-2009	2010-2014
San Francisco	29%	30%
Berkeley	17%	21%
Oakland	17%	17%
Alameda County	10%	10%

Source: American Community Survey 5- Year Estimates, 2005-2009 and 2010-2014

Walking to Transit

Walking is the way Oaklanders most often reach other modes of transportation (see Table 3.3). On average, more than three-quarters of transit trips citywide begin with a walk. AC Transit has the highest percentage (95%) of riders accessing their first stop on foot. Approximately 58% of BART passengers in Oakland walk to the station. Approximately 80% of passengers access Oakland's two busiest BART stations, 12th Street/City Center and 19th Street by walking.

Table 3.3: Walking to Transit

Transit agency	Average weekday walk access	
	#	%
AC Transit	83,410	95%
BART	42, 439	58%
WETA (ferry)	260	26%
AMTRAK	34	22%
Total/Weighted Average (%)	126,143	78%

Source: AC Transit, 2015; BART, 2015; WETA, 2015; Capitol Corridor, 2015

Public Health

Over the past decade, Oakland's rates of obesity, diabetes and high blood pressure have remained the same or increased (see Table 3.4). Studies have shown a significant relationship between a city's walkability and these conditions.[8] The U.S. Department of Health and Human Services recommends that Americans get at least 150 minutes of physical activity each week. Walking can help Oakland residents get their recommended exercise and improve their health.

Violence, and the fear of violence, can make it more difficult for communities to engage in physical activity. People walking can be vulnerable to street crime due to poor lighting, secluded walking environments, or not enough street activity (also known as "eyes on the street). Some community meeting attendees indicated that fear of crime deters people from walking at night.

Table 3.4: Public Health in Oakland

Health Outcome	% Adults (2005)	% Adults (2012)	Change
Overweight or obese	52%	58%	+6%
Diabetes	7%	9%	+2%
Asthma	10%	11%	+1%
High blood pressure	27%	27%	0%

Source: Behavioral Risk Factor Surveillance System 2005, 2011, and 2012; https://www.cdc.gov/brfss/index.html

8. Smith, K.R., Brown, B.B., Yamada, I., Kowaleski-Jones, L., Zick, C.D. and Fan, J.X. Walkability and Body Mass Index. American Journal of Preventive Medicine. 2008.

3.2 Walking Facilities

Below are descriptions of common walking facilities in Oakland:

Sidewalk

The Oakland Municipal Code calls for sidewalks to be at least 5.5 feet wide and clear of obstructions. There are 1,120 linear miles of sidewalk in Oakland.

Marked Crosswalk

Marked crosswalks indicate recommended places to cross the street and help motorists see pedestrians.

Curb Ramps

Curb ramps are sloped surfaces that connect the sidewalk to the street. Oakland has been constructing curb ramps since 1987. Curb ramps are disability access features and must meet requirements about slope, width, location, and surface treatment. Ramps allow persons using a wheelchair or other mobility devices to mount and dismount sidewalk curbs. They also provide tactile warning strips to signal the street transition to persons with vision impairments. Table 3.7 *Citywide Facilities and Demographics*, describes the number of Non-ADA compliant ramps currently in Oakland.

Photos by Kerby Olsen

3.2 Walking Facilities (continued)

Below are descriptions of common walking facilities in Oakland:

Pedestrian Push-Button

Pedestrian push-bottons activate the pedestrian WALK phase at signalized intersections that do not automatically provide one.

Lighting

Sidewalk and street lighting helps people traverse sidewalks and cross streets at night. They also help to deter crime and provide a perception of personal security.

Pathways & Stairways

The City maintains 225 off-street pathways and stairways. Most are over 80 years old.

Curb Extension

Curb extensions or "bulb outs" are an enlargement of the sidewalk to make crossing the street safer. They increase drivers' ability to see people waiting to cross the street, shorten crossing distances and provide extra space for pedestrians to wait to cross.

Pedestrian Signs

Signs can help direct people walking to nearby civic buildings, points of interest or transit connections. Pedestrian-oriented signs are currently limited to the Uptown area.

Pedestrian Signal Head

These electronic signs show a figure walking when crossing is permitted or a red hand when it is not. Some, called "countdown signals," also indicate how many seconds remain to cross the street, assuming a walking speed of 3.5 feet per second.

Photos by Kerby Olsen

3.3 Walkscore

Whether a place is walkable depends in part on what daily needs and services are within walking distance. Walk Score®* is an application that categorizes whether a location is walkable (see Table 3.5). To do this, Walk Score® analyzes potential walking routes to nearby amenities including transit stops and stations, schools, grocery stores, restaurants, and parks. Points are awarded based on the distance to amenities in various categories and pedestrian friendliness. Pedestrian friendliness is measured by analyzing population density, intersection density, and block length.

This Plan used Walk Score® data to create a walkability score because it is a simple measure that many community members are familiar with. At the same time, there are limitations to using Walk Score® data. The score does not account for many factors that may influence walking trips such a topography, speed limits, sidewalk presence or width, trees, lighting, or pedestrian-friendly design. For a citywide map of Walk Score® data see Map 3.1.

Table 3.5 WalkScore Categories

Walk Score®	Description
90-100	Walker's Paradise: Daily errands do not require a car
70-89	Very Walkable: Most errands can be accomplished on foot
50-69	Somewhat Walkable: Some errands can be accomplished on foot
25-49	Car-Dependent: Most errands require a car
0-24	Car-Dependent: Almost all errands require a car

Table 3.6 Plan Area Walk Scores

Central East Oakland	67
Coliseum/Airport	19
Downtown	93
East Oakland Hills	19
Eastlake/Fruitvale	78
Glenview/Redwood Heights	57
North Oakland Hills	22
North Oakland/Adams Point	83
West Oakland	42

3.4 Programs and Policies

Oakland's pedestrian programs include a variety of ongoing investments to improve walking. This section describes walking related program, policies, and community group-led walking programs.

The **Oakland Police Department Traffic Section** has 21 sworn staff, nine of whom are assigned to the School Safety Enforcement Motorcycle Unit. The Traffic Section addresses speeding, failure to yield to pedestrians, and hit-and-run collisions. Also, the Traffic Section conducts about a dozen operations each year focused on enforcing traffic laws important for pedestrians and bicyclist safety. During these operations, officers cite motorists for infractions such as speeding and driving under the influence. These infractions are key causes of pedestrian and bicyclist collisions. The operations occur both at random locations and where complaints have identified a pattern of traffic violations.

The Oakland Police Department's Traffic Section conducts monthly enforcement actions in areas where the community is concerned about pedestrian injuries or fatalities. For instance, in the March 2016 operation, 51 citations were issued for unsafe behavior.

*All Walk Score® Data provided by Redfin Real Estate in Oakland: https://www.redfin.com/city/13654/CA/Oakland

What is Universal Access?

Universal walking access refers to streets that allow anyone to reach their destination on foot or with the help of a wheelchair or other mobility device. Additionally, missing sidewalks, sidewalk gaps, poor sidewalk quality, inaccessible stops, and lack of signals are also an important component of universal walk access. Curb ramps, pedestrian signal heads, and audible pedestrian traffic signals (APTS), help make this vision possible. Downtown Oakland has the highest concentration of corners equipped with curb ramps, but just 59% are ADA-compliant. In the North Oakland hills, 80% of curbs have no ramps at all, and only 12% of ramps meet ADA standards. The City's 2009 ADA Transition Plan, scheduled for an update in 2017, also includes a curb ramp inventory and an updated timeline for curb ramp improvements.

For more information: http://www2.oaklandnet.com/government/o/PWA/o/EC/s/ADA/DOWD005072

Parking enforcement officers also help keep pedestrians safe. They can issue citations to cars parked in red zones or blocking crosswalks and sidewalks. Parking in a red zone can block drivers' views of pedestrians, making intersections unsafe. Parking in a crosswalk or on the sidewalk can also force pedestrians into busy roadways. Oakland's 75 parking enforcement officers issue an average of 18,500 parking citations per year for parking in a red zone, crosswalk or sidewalk.

Oakland participates in a **Safe Routes to Schools (SR2S)** program funded by the Alameda County Transportation Commission. TransForm, a local non-profit that promotes walkable communities, operates this program. In the 2015/16 academic year, TransForm partnered with more than 40 schools in Oakland to identify access issues for students walking and biking to school.

The Oakland DOT's SR2S program focuses on installing quick safety improvements near schools, such as striping and signage. For costlier permanent projects, the City may pursue grants. Oakland Police Department (OPD) officers also help schools identify safe drop-off and pick-up locations. OPD's Traffic Section includes a Crossing Guard program that employs 48 crossing guards at 40 schools. See Appendix E for a full list of schools that have had walk audits, and those that have had infrastructure repairs completed.

3.4 Programs and Policies (continued)

Be Oakland Be Active (BOBA) is a collaborative program, led by the Alameda County Public Health Department, that includes the Oakland Unified School District, the Oakland Police Department and TransForm. The goal of the project is to bring comprehensive SR2S programming to all 40 low income elementary schools in Oakland. In addition to the standard education and encouragement elements that TransForm traditionally offers, the BOBA project also:

- Establishes student safety patrols at every school that has enough staff
- Provides increased enforcement from OPD
- Creates transportation safety plans for every school
- Funnels school requests for infrastructure improvements to the City
- Includes a school district-wide wellness program that allows parents and staff to sign up to be "wellness champions". Wellness champions receive stipends for implementing SR2S activities at their schools.

The BOBA grant concludes in 2018. The City and its partners anticipate re-applying at that time.

Sergio Ruiz

Pedestrians Count!

Pedestrians are an essential force when it comes to traffic-generating areas in the city of Oakland. So what areas of the city generate high pedestrian usage? How does that compare to other areas of the city? The City of Oakland monitors the volume of pedestrians, cyclists, and automobiles using the pedestrian counts map. Each blue dot on the map connects to a file that tells you the location, date, time, and duration of each count. The City has identified specific locations where they perform an annual pedestrian count at, but also performs new counts for large projects. Pedestrian counts are just one of the components that are used to identify the effectiveness of various pedestrian programs and policies in creating a vitalizing, safe, and equitable experience.

For more information:

http://www.oaklandbikemaps.info/counts/

3.5 Citywide Walking Conditions

Table 3.7 Citywide Facilities, Demographics, and Safety

Facilities	Area (sq miles)	Area (% of City)	Sidewalks (miles)	Streets (miles)	Curb ramps ADA (%)	Curb Ramps Non-ADA*	No curb ramp (%)	Signals w/ ped heads (%)	Sidewalk damaged (%)
West Oakland	6	11%	102	98	49%	28%	23%	49%	15%
Downtown	1	2%	49	39	59%	32%	9%	37%	17%
Eastlake/Fruitvale	6	10%	219	145	43%	12%	45%	44%	22%
Coliseum/Airport	6	11%	25	47	41%	5%	54%	33%	16%
Central East Oakland	8	14%	272	176	38%	12%	50%	61%	26%
East Oakland Hills	10	19%	93	143	27%	4%	69%	81%	16%
Glenview/Redwood Heights	4	7%	118	86	35%	4%	62%	33%	23%
North Oakland Hills	9	16%	17	131	12%	7%	80%	79%	17%
North Oakland/Adams Point	6	10%	225	139	51%	14%	34%	53%	24%
Citywide	56	100%	1,120	1,002	42%	13%	45%	47%	22%

*Non-ADA: Not compliant with current ADA standards.

Demographics	Total pop	African American	Asian (%)	Hispanic/ Latino (%	White (non-Hispanic) (%)	Other (%)	17 and under (%)	65 and over (%)	With a disability (%)	Severely rent burdened (%)
West Oakland	25,067	46%	12%	17%	19%	5%	23%	9%	16%	31%
Downtown	17,688	18%	42%	9%	26%	6%	7%	20%	19%	24%
Eastlake/Fruitvale	96,418	19%	30%	34%	13%	5%	22%	10%	12%	30%
Coliseum/Airport	4,037	37%	5%	49%	4%	6%	33%	8%	12%	39%
Central East Oakland	96,018	36%	6%	48%	7%	4%	30%	8%	12%	40%
East Oakland Hills	30,586	41%	10%	14%	28%	7%	20%	15%	12%	38%
Glenview/Redwood Heights	32,168	14%	17%	11%	50%	7%	20%	15%	9%	25%
North Oakland Hills	23,587	5%	14%	6%	68%	7%	19%	17%	6%	21%
North Oakland/Adams Point	76,770	21%	13%	11%	49%	6%	12%	13%	11%	23%
Citywide	402,339	26%	16%	26%	27%	6%	21%	12%	12%	

3.5 Citywide Walking Conditions

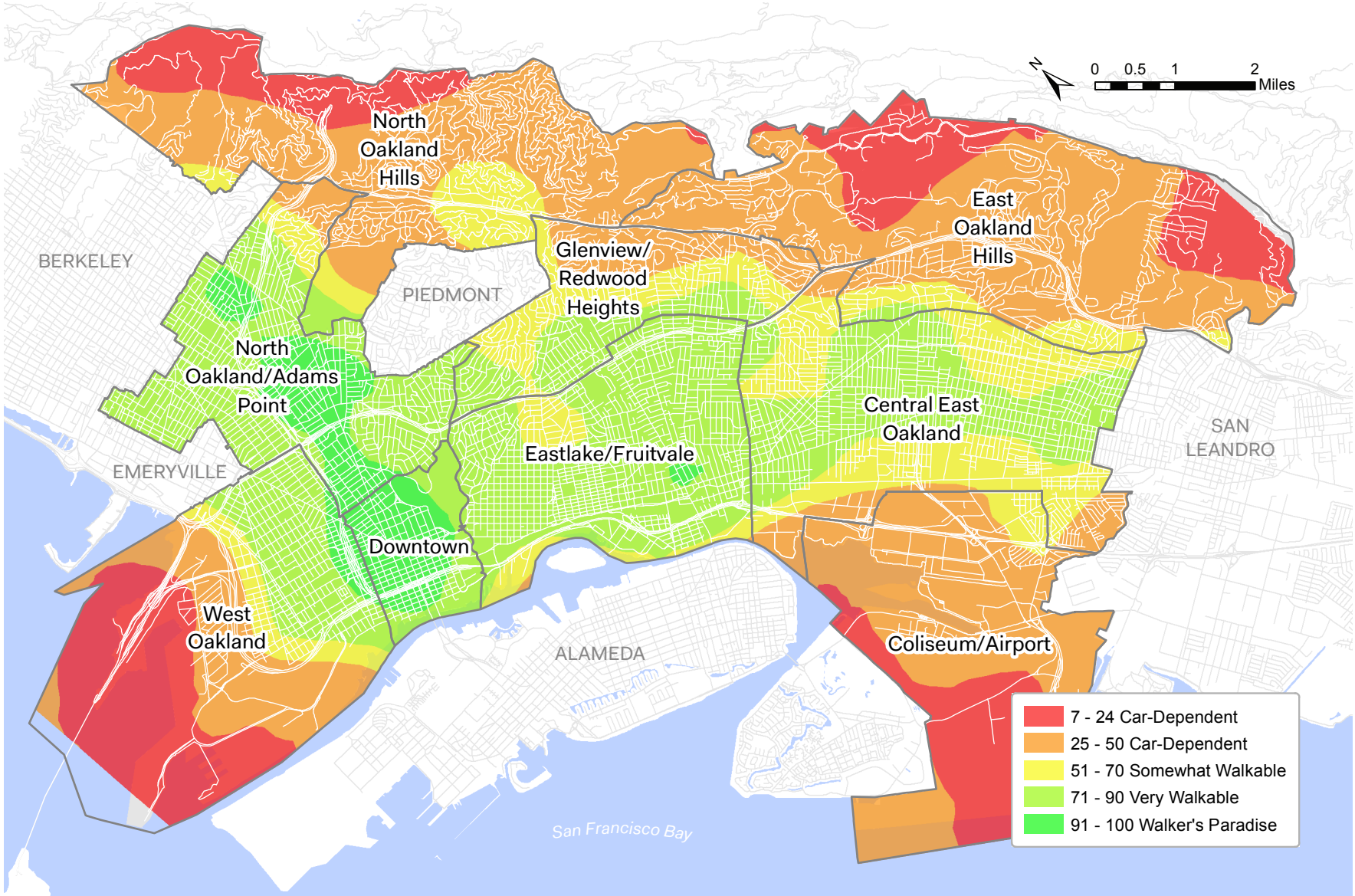
Table 3.7 Citywide Facilities, Demographics, and Safety (continued)

Safety	Avg. fatalities/ year	Avg. severe injuries/year	Total Injuries (2008-2014)	Avg. fatalities 100k/year**	Avg. injuries/ 100,000/year	Avg. Injuries/ Street Mile
West Oakland	1	3	24	2	96	0.2
Downtown	1	2	46	5	259	0.9
Eastlake/Fruitvale	2	5	66	2	69	0.3
Coliseum/Airport	0.4	0.3	4	10	89	0.1
Central East Oakland	2	6	56	2	59	0.2
East Oakland Hills	0.3	0.1	6	1	20	0.1
Glenview/Redwood Heights	0	1	11	0	34	0.1
North Oakland Hills	0	0.3	5	0	21	0.3
North Oakland/Adams Point	1	3	48	2	63	0.2
Citywide	7	22	267	2	66	0.2

Oakland Public Library

** Some Plan Areas have a larger population than others. These figures measure average fatalities and injuries in a specific Plan Area against Citywide averages.

Map 3.1: Walk Score



All Walk Score® Data provided by Redfin Real Estate in Oakland: https://www.redfin.com/city/13654/CA/Oakland

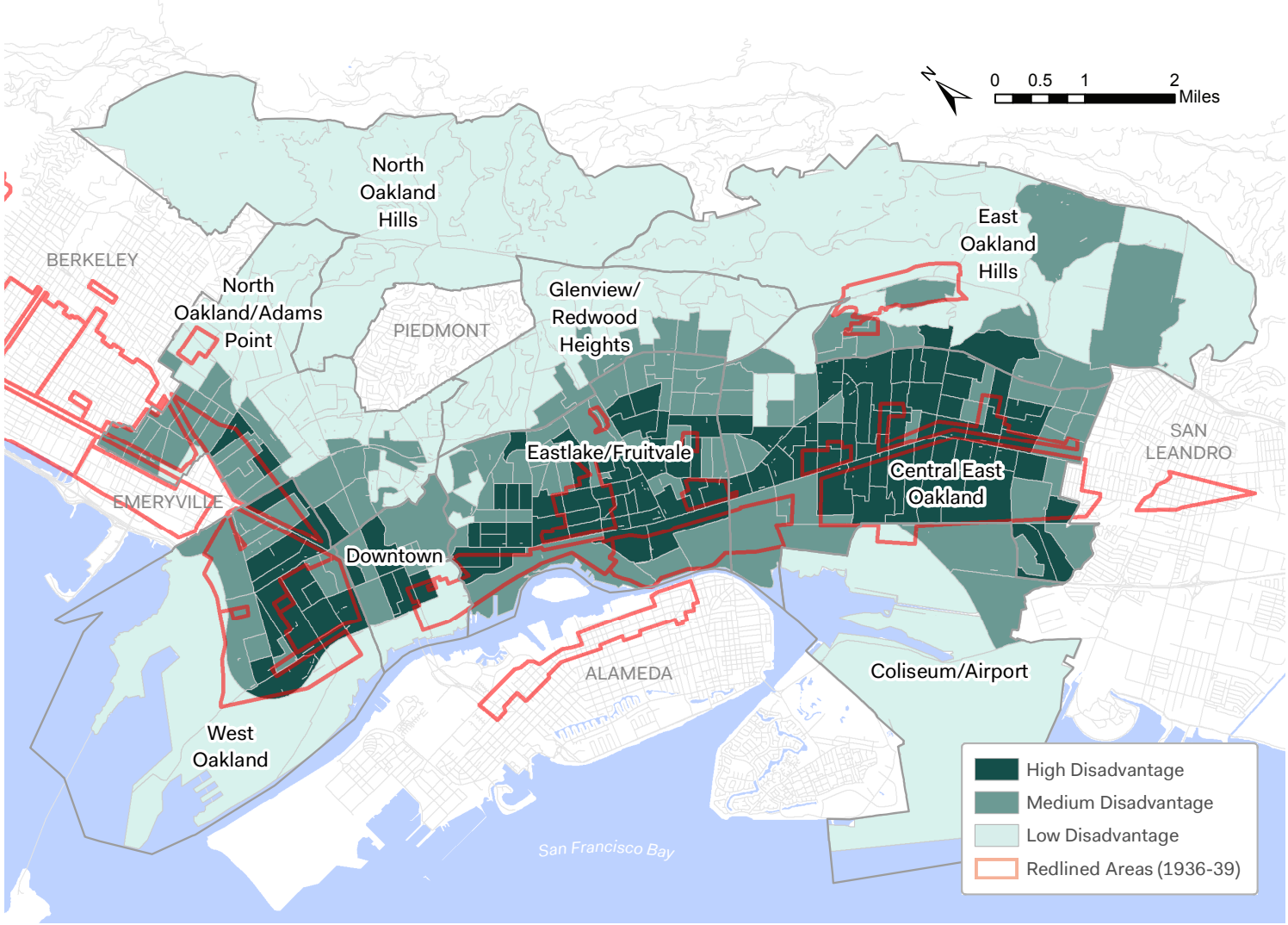
What is it?

Oakland's "Communities of Concern," is a metric created by the Metropolitan Transportation Commission and is used to identify areas with concentrations of residents who face potential disadvantages and barriers to mobility. These characteristics include:

- Race/Ethnicity
- Low Income (<200% of Poverty) Population
- Limited English Proficiency Population
- Zero-Vehicle Households
- Seniors 75 and Over
- Population with a Disability
- Single-Parent Families
- Severely Rent-Burdened Households

Areas that are dark green (High Disadvantage) have populations with more than one characteristic present. For example, a person who is low income and over 75 is counted twice in this methodology; therefore the more factors present in an area, the deeper the disadvantage.

Map 3.2: Communities of Concern

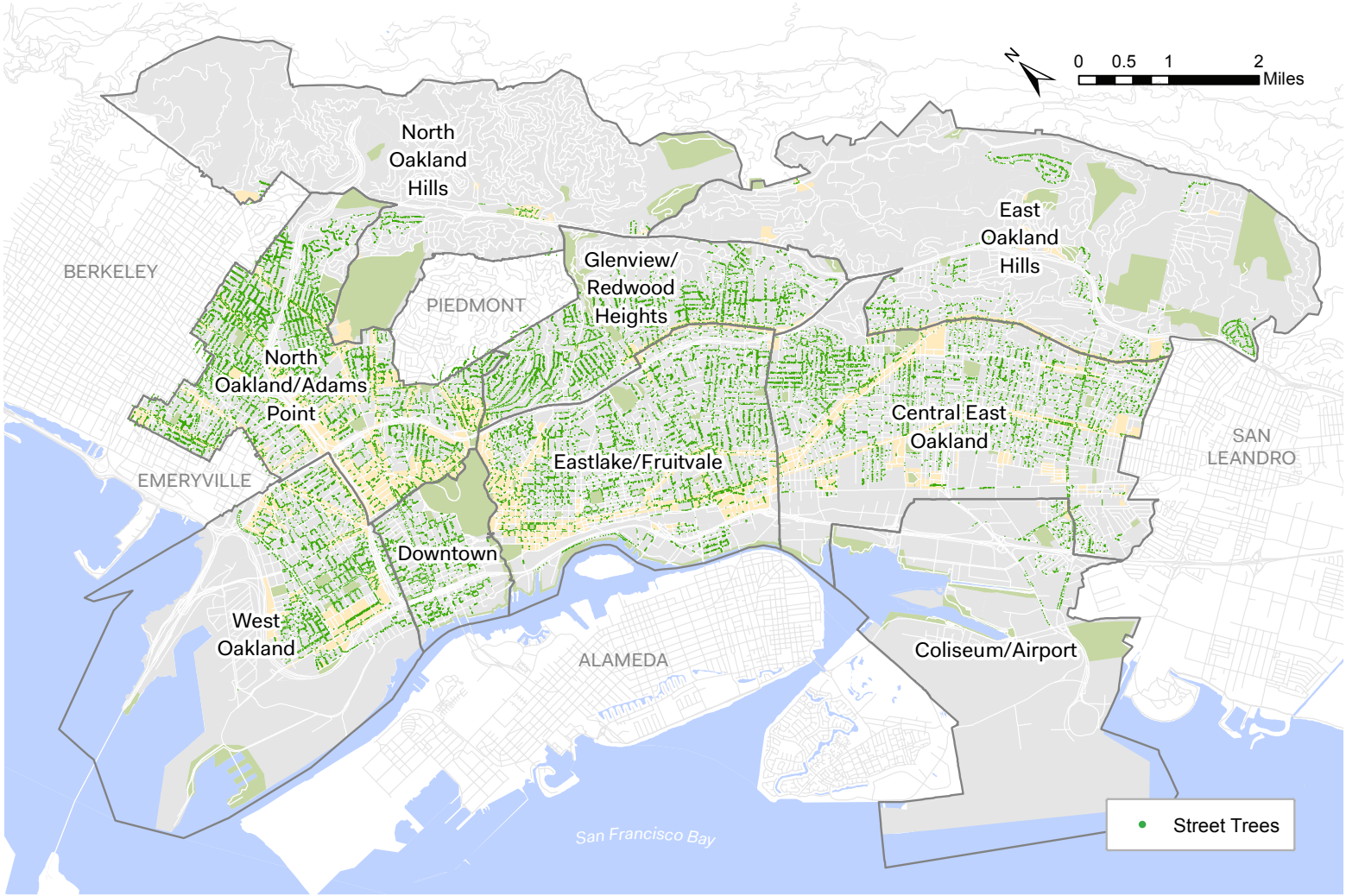


Red Lining Data: https://joshbegley.com/redlining/oakland

Street Trees

Oakland's street trees provide many benefits. They shade the sidewalk, absorb greenhouse gases, and slow traffic by making the roadway seem narrower. There are over 46,000 street-side trees in Oakland, not including those in medians and in parks.

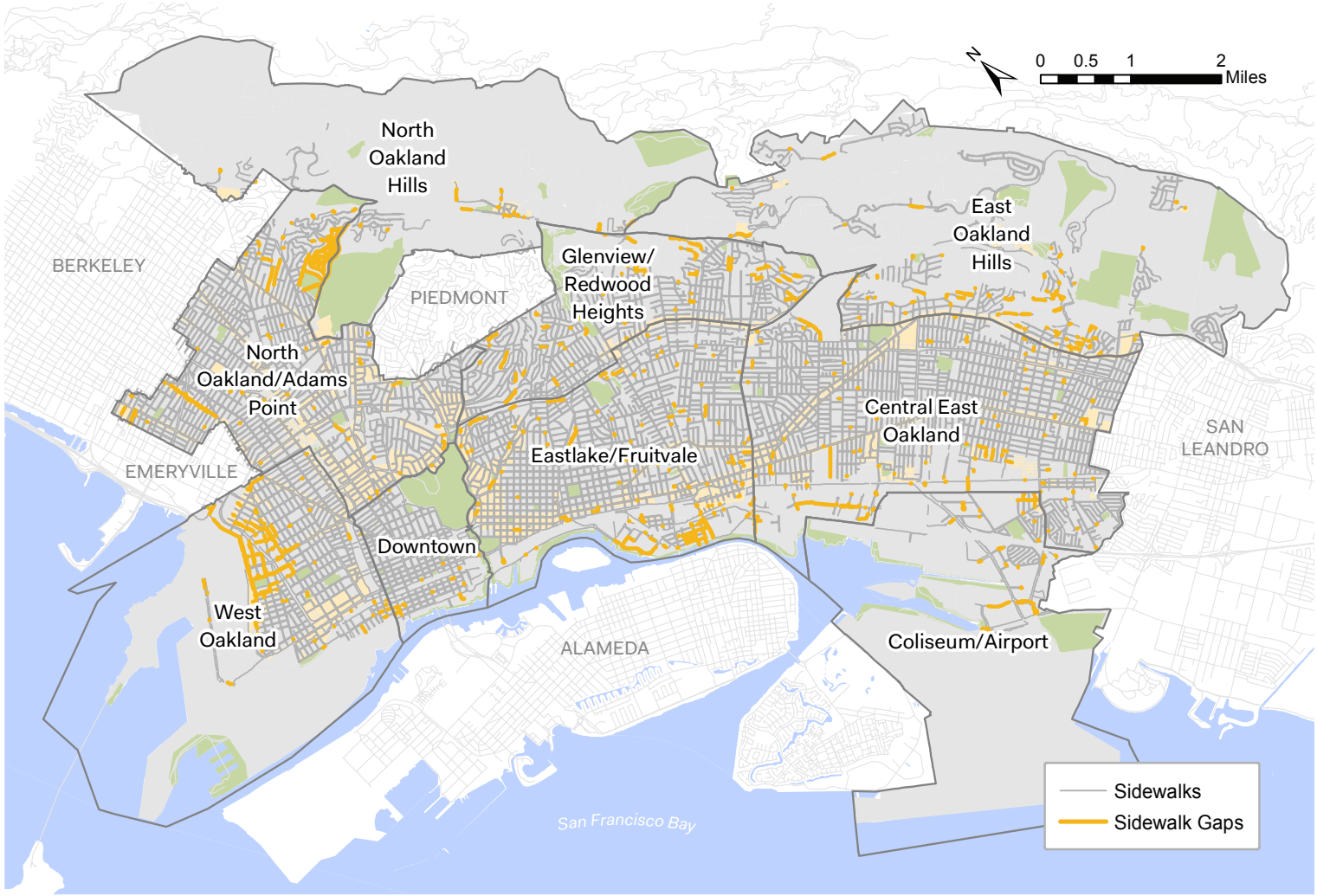
Map 3.3: Street Trees



Sidewalk Gaps

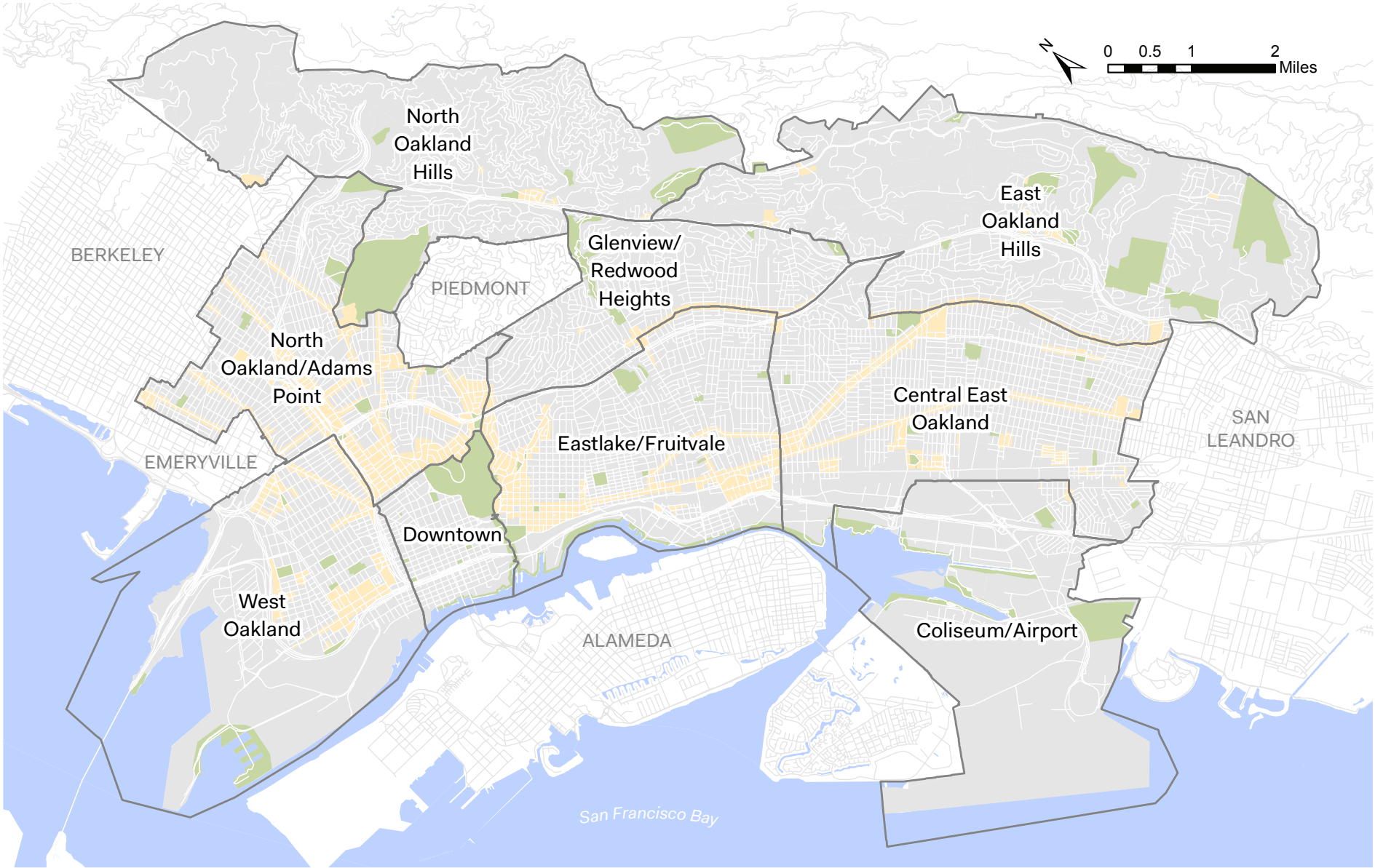
In 2006, the City surveyed all sidewalks in Oakland and documented sidewalk gaps and damage. Although dated, this data is still the most complete source of information about sidewalk conditions. At this time, there is no data available in order to estimate the cost of expanding sidewalks where none currently exist. Sidewalk gaps are places within the sidewalk network where a sidewalk doesn't exist. These gaps may be due to hillside terrain, because the adjacent street leads to a restricted area (such as a freeway), or simply because a sidewalk was never built. In total, about 162,000 linear feet of sidewalk gaps exist. The North Oakland Hills and West Oakland areas have the highest share of sidewalks missing, at 7% and 5%, respectively. By contrast, the Downtown area is only missing about 1% of its sidewalks.

Map 3.4: Sidewalk Gaps



3.6 Plan Areas

This section provides a description and key data about each of the Plan's nine areas: East Oakland Hills, Central East Oakland, Coliseum/Airport, Glenview/Redwood Heights, Eastlake/Fruitvale, North Oakland Hills, North Oakland/Adams Point, Downtown and West Oakland. The Plan Area maps also include mixed-use commercial areas, because having neighborhood destinations to walk to are essential to improving the vitality of pedestrian environments.



East Oakland Hills

East Oakland Hills includes the hilliest areas of Oakland's eastern edge, south of the North Oakland Hills and above MacArthur Boulevard. Forty-one percent of East Oakland Hills residents are African American, compared to a citywide average of twenty-six percent.

Walk Score®: 19 (Car Dependent)

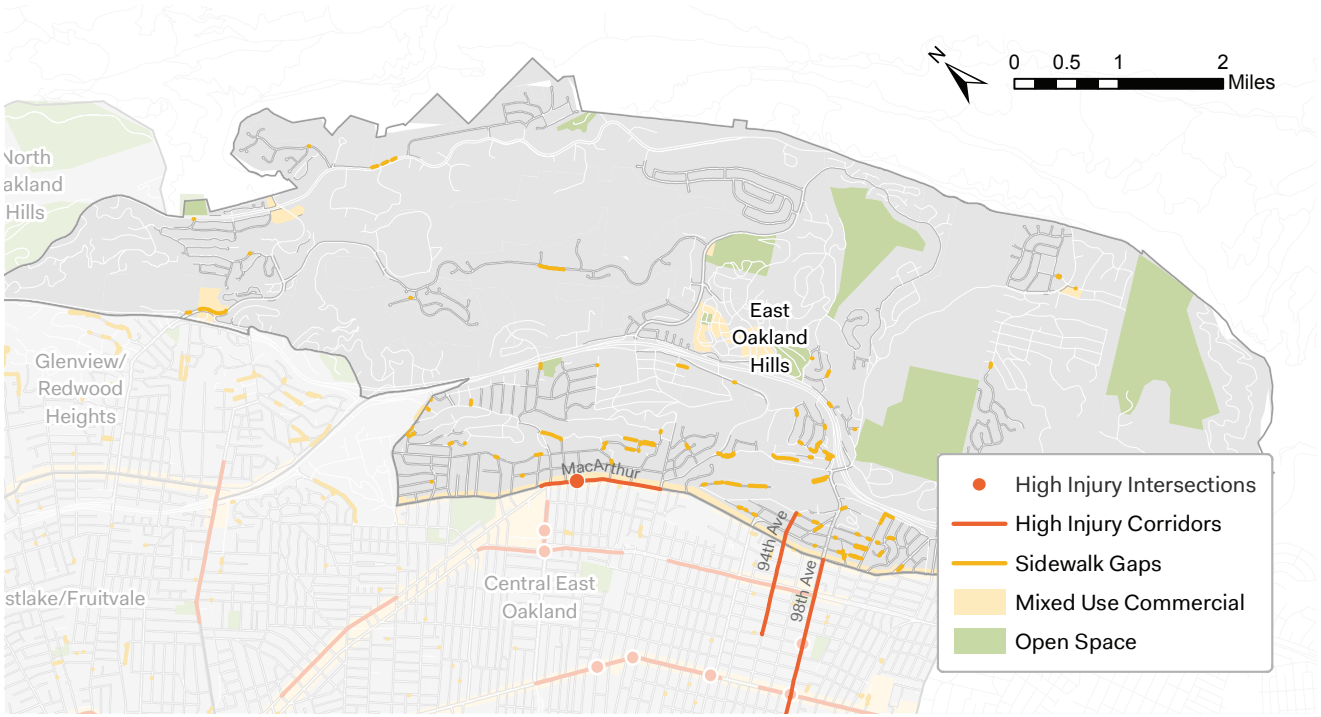


Table 3.8: East Oakland Hills Facilities, Demographics, and Safety

Facilities	Area (sq miles)	Area (% of City)	Sidewalks (miles)	Streets (miles)	Curb ramps ADA (%)	Curb ramps non-ADA (%)	No curb ramp (%)	Signals w/ ped heads	Sidewalk damaged (%)
East Oakland Hills	10	19%	93	143	27%	4%	69%	81%	16%
Citywide	56	100%	1,120	1,002	42%	13%	45%	47%	22%

Demographics	Total pop.	African American	Asian	Hispanic/ Latino*	White (non-Hispanic)	Other	17 and under	65 and over	With a disability	Severely rent burdened
East Oakland Hills	30,586 (8%)	41%	10%	14%	28%	7%	20%	15%	12%	38%
Citywide	402,339	26%	16%	26%	27%	6%	21%	12%	12%	30%

Safety	Avg. fatalities/ year	Avg. severe injuries/year	Total injuries (2008-2014)	Avg. fatalities 100k/year**	Avg. injuries/ 100,000/year	Avg. injuries/ street mile
East Oakland Hills	0.3	0.1	6	1	20	0.1
Citywide	7	22	267	2	66	0.2

* Hispanic indicates the Hispanic Ethnicity category on the Census. Any individual who described themselves as Hispanic plus a race category is included as Hispanic/Latino.
** Some Plan Areas have a larger population than others. These figures measure average fatalities and injuries in a specific Plan Area against Citywide averages.

Central East Oakland

Central East Oakland is located between the Eastlake/ Fruitvale district and the City of San Leandro, MacArthur Boulevard, and the Coliseum/Airport area. This area includes the Eastmont Mall and the commercial areas of Fairfax (on Foothill Boulevard) and Elmhurst. Commercial areas are also located along the wide, fast-moving International Boulevard. Industrial development is located near I-880; otherwise, Central East Oakland is primarily residential. Area residents are 93% non-white. Nearly a quarter of Oakland's fatal pedestrian crashes and nearly one-third of crashes that resulted in serious injury were in this area.

Walk Score®: 67 (Somewhat Walkable)

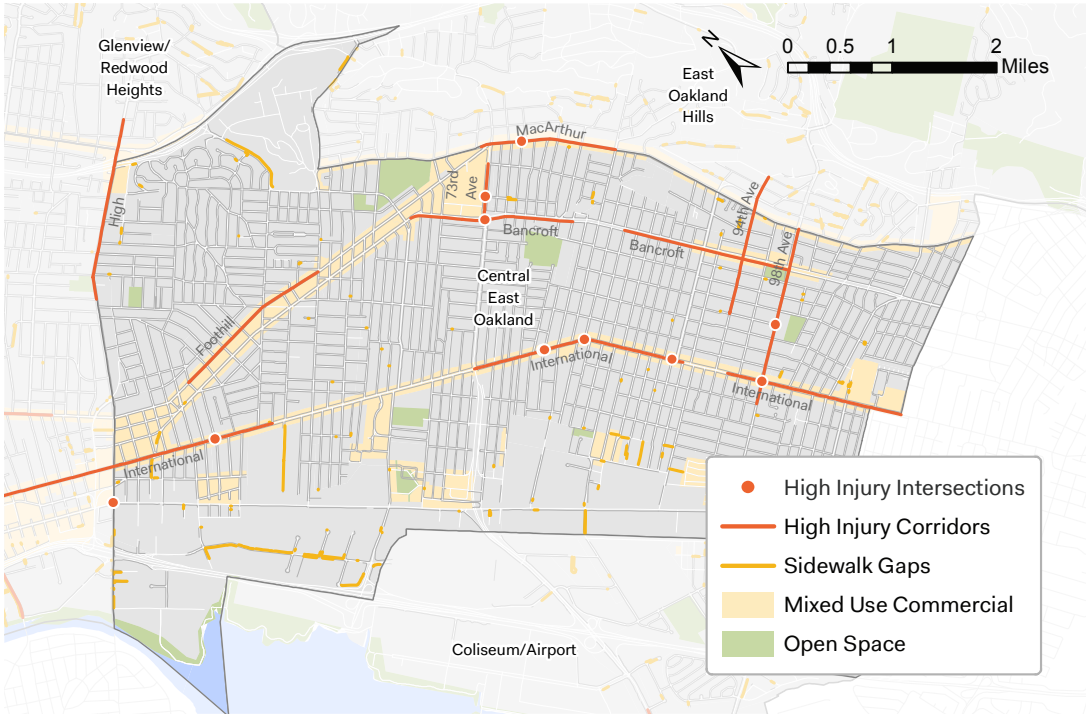


Table 3.9: Central East Oakland Facilities, Demographics, and Safety

Facilities	Area (sq miles)	Area (% of City)	Sidewalks (miles)	Streets (miles)	Curb ramps ADA (%)	Curb ramps non-ADA (%)	No curb ramp (%)	Signals w/ ped heads	Sidewalk damaged (%)
Central East Oakland	8	14%	272	176	38%	12%	50%	61%	26%
Citywide	56	100%	1,120	1,002	42%	13%	45%	47%	22%

Demographics	Total pop.	African American (%)	Asian (%)	Hispanic/ Latino* (%)	White (non-Hispanic) (%)	Other (%)	17 and under (%)	65 and over (%)	With a disability (%)	Severely rent burdened (%)
Central East Oakland	96,018 (24%)	36%	6%	48%	7%	4%	30%	8%	12%	40%
Citywide	402,339	26%	16%	26%	27%	6%	21%	12%	12%	30%

Safety	Avg. fatalities/ year	Avg. severe injuries/year	Total Injuries (2008-2014)	Avg. fatalities 100k/year**	Avg. injuries/ 100,000/year	Avg. injuries/ street mile
Central East Oakland	2	6	56	2	59	0.2
Citywide	7	22	267	2	66	0.2

* Hispanic indicates the Hispanic Ethnicity category on the Census. Any individual who described themselves as Hispanic plus a race category is included as Hispanic/Latino.

** Some Plan Areas have a larger population than others. These figures measure average fatalities and injuries in a specific Plan Area against Citywide averages.

Coliseum/Airport

Coliseum/Airport includes the Oakland Coliseum, Oakland Airport and Coliseum BART station. It is located between the City of San Leandro, the City of Alameda, the Central East Oakland area and the San Francisco Bay. Industrial development is the primary land use along I-880 and near the Oakland Airport and Oakland Coliseum. Only 33% of signals have pedestrian heads and none include countdown indicators—the lowest percentages in the city. Despite a low rate of overall collisions, there were two fatal pedestrian crashes in this area between 2008-2013. This area had the third highest average rate of injuries after Downtown and West Oakland.

Walk Score®: 19 (Car Dependent)

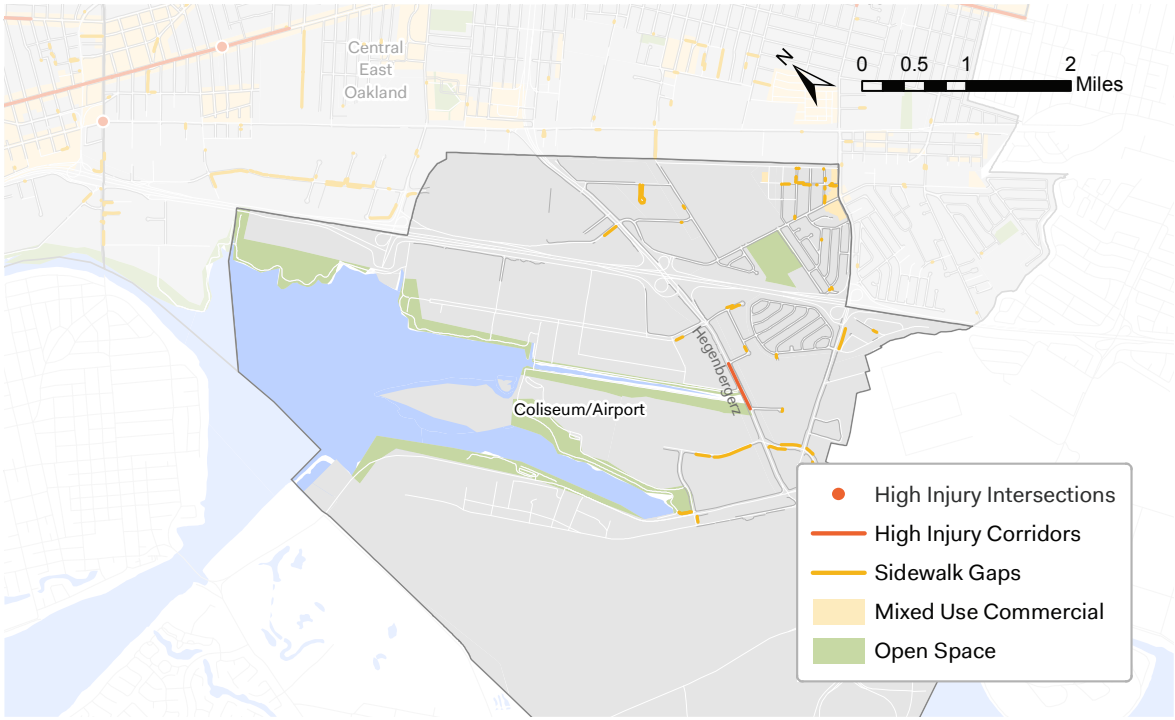


Table 3.10: Colesium/Airport Facilities, Demographics, and Safety

Facilities	Area (sq miles)	Area (% of City)	Sidewalks (miles)	Streets (miles)	Curb ramps ADA (%)	Curb Ramps non-ADA (%)	No curb ramp (%)	Signals w/ ped heads	Sidewalk damaged (%)
Coliseum/Airport	6	11%	25	47	41%	5%	54%	33%	16%
Citywide	56	100%	1,120	1,002	42%	13%	45%	47%	22%

Demographics	Total pop.	African American (%)	Asian (%)	Hispanic/ Latino* (%)	White (non-Hispanic) (%)	Other (%)	17 and under (%)	65 and over (%)	With a disability (%)	Severely rent burdened (%)
Coliseum/Airport	4,037 (1%)	37%	5%	49%	4%	6%	33%	8%	12%	39%
Citywide	402,339	26%	16%	26%	27%	6%	21%	12%	12%	30%

Safety	Avg. fatalities/ year	Avg. severe injuries/year	Total injuries (2008-2014)	Avg. fatalities 100k/year**	Avg. injuries/ 100,000/year	Avg. injuries/ street mile
Coliseum/Airport	0.4	0.3	4	10	89	0.1
Citywide	7	22	267	2	66	0.2

* Hispanic indicates the Hispanic Ethnicity category on the Census. Any individual who described themselves as Hispanic plus a race category is included as Hispanic/Latino.

** Some Plan Areas have a larger population than others. These figures measure average fatalities and injuries in a specific Plan Area against Citywide averages.

Glenview/Redwood Heights

Glenview/Redwood Heights is located below Highway 13, above MacArthur Boulevard/I-580, and south of Grand Avenue. The district comprises the hilly but walkable neighborhoods immediately east of Eastlake/Fruitvale. This area is home to the Dimond and Laurel commercial districts. Lower traffic speeds may provide comfortable environments for walking.

Walk Score®: 57 (Somewhat Walkable)

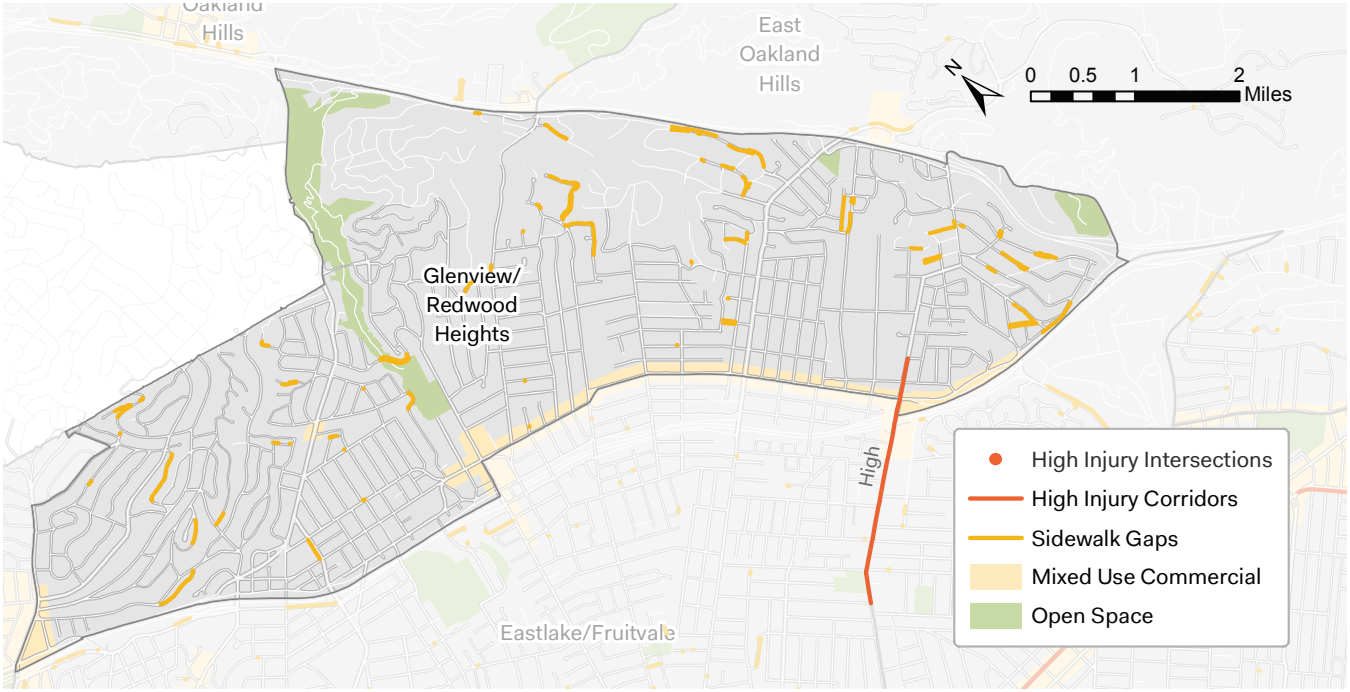


Table 3.11: Glenview/Redwood Heights Facilities, Demographics, and Safety

Facilities	Area (sq miles)	Area (% of City)	Sidewalks (miles)	Streets (miles)	Curb ramps ADA (%)	Curb ramps non-ADA (%)	No curb ramp (%)	Signals w/ ped heads	Sidewalk damaged (%)
Glenview/Redwood Heights	4	7%	118	86	35%	4%	62%	33%	23%
Citywide	56	100%	1,120	1,002	42%	13%	45%	47%	22%

Demographics	Total pop.	African American (%)	Asian (%)	Hispanic/ Latino* (%)	White (non-Hispanic) (%)	Other (%)	17 and under (%)	65 and over (%)	With a disability (%)	Severely rent burdened (%)
Glenview/Redwood Heights	32,168 (13%)	14%	17%	11%	50%	7%	20%	15%	9%	25%
Citywide	402,339	26%	16%	26%	27%	6%	21%	12%	12%	30%

Safety	Avg. fatalities/ year	Avg. severe injuries/year	Total injuries (2008-2014)	Avg. fatalities 100k/year**	Avg. injuries/ 100,000/year	Avg. injuries/ street mile
Glenview/Redwood Heights	0	1	11	0	34	0.1
Citywide	7	22	267	1.7	66	0.2

* Hispanic indicates the Hispanic Ethnicity category on the Census. Any individual who described themselves as Hispanic plus a race category is included as Hispanic/Latino.

** Some Plan Areas have a larger population than others. These figures measure average fatalities and injuries in a specific Plan Area against Citywide averages.

Eastlake/Fruitvale

Eastlake/Fruitvale is located between the Brooklyn Basin Waterfront and I-580, the south shore of Lake Merritt, and High Street. Commercial areas include Eastlake/International Boulevard, Lake Merritt Parkway, the Fruitvale BART station and International Boulevard/Foothill Boulevard. Sausal and Peralta Creeks create barriers to people walking in the area. This district is largely residential, with some industrial and commercial areas near I-880. The eastern edge of the district has industrial and marine uses. The Bay Trail runs along the Estuary, parallel to Embarcadero. The area has a higher than average proportion of Hispanic/Latino (34%) and Asian (30%) residents.

Walk Score®: 78 (Very Walkable)

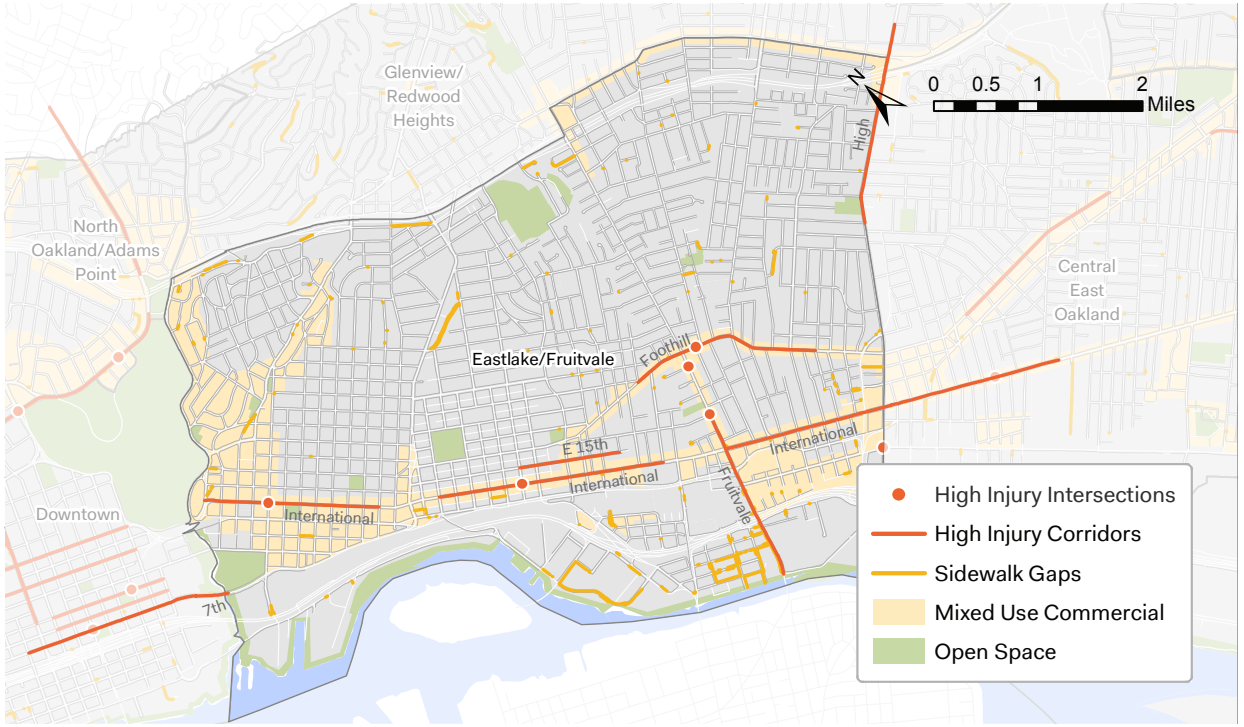


Table 3.12: Eastlake/Fruitvale Facilities, Demographics, and Safety

Facilities	Area (sq miles)	Area (% of City)	Sidewalks (miles)	Streets (miles)	Curb ramps ADA (%)	Curb ramps non-ADA (%)	No curb ramp (%)	Signals w/ ped heads	Sidewalk damaged (%)
Eastlake/Fruitvale	6	10%	219	145	43%	12%	45%	44%	22%
Citywide	56	100%	1,120	1,002	42%	13%	45%	47%	22%

Demographics	Total pop.	African American (%)	Asian (%)	Hispanic/ Latino* (%)	White (non-Hispanic) (%)	Other (%)	17 and under (%)	65 and over (%)	With a disability (%)	Severely rent burdened (%)
Eastlake/Fruitvale	96,418 (24%)	19%	30%	34%	13%	5%	22%	10%	12%	30%
Citywide	402,339	26%	16%	26%	27%	6%	21%	12%	12%	30%

Safety	Avg. fatalities/ year	Avg. severe injuries/year	Total injuries (2008-2014)	Avg. fatalities 100k/year**	Avg. injuries/ 100,000/year	Avg. injuries/ street mile
Eastlake/Fruitvale	2	5	66	2.0	69	0.3
Citywide	7	22	267	1.7	66	0.2

* Hispanic indicates the Hispanic Ethnicity category on the Census. Any individual who described themselves as Hispanic plus a race category is included as Hispanic/Latino.

** Some Plan Areas have a larger population than others. These figures measure average fatalities and injuries in a specific Plan Area against Citywide averages.

North Oakland Hills

North Oakland Hills is the hilliest area in the north part of the city. It is primarily residential and, along the ridge, parkland. This area has the lowest proportion of minority residents (68% White/Non-Hispanic) and zero-vehicle households in Oakland. It has the lowest number of sidewalk miles, curb ramps, and the least number of pedestrian fatalities per year along with Glenview/Redwood Heights. This may be because there are few walkable destinations for pedestrians and steep hills to climb.

Walk Score®: 22 (Car-Dependent)

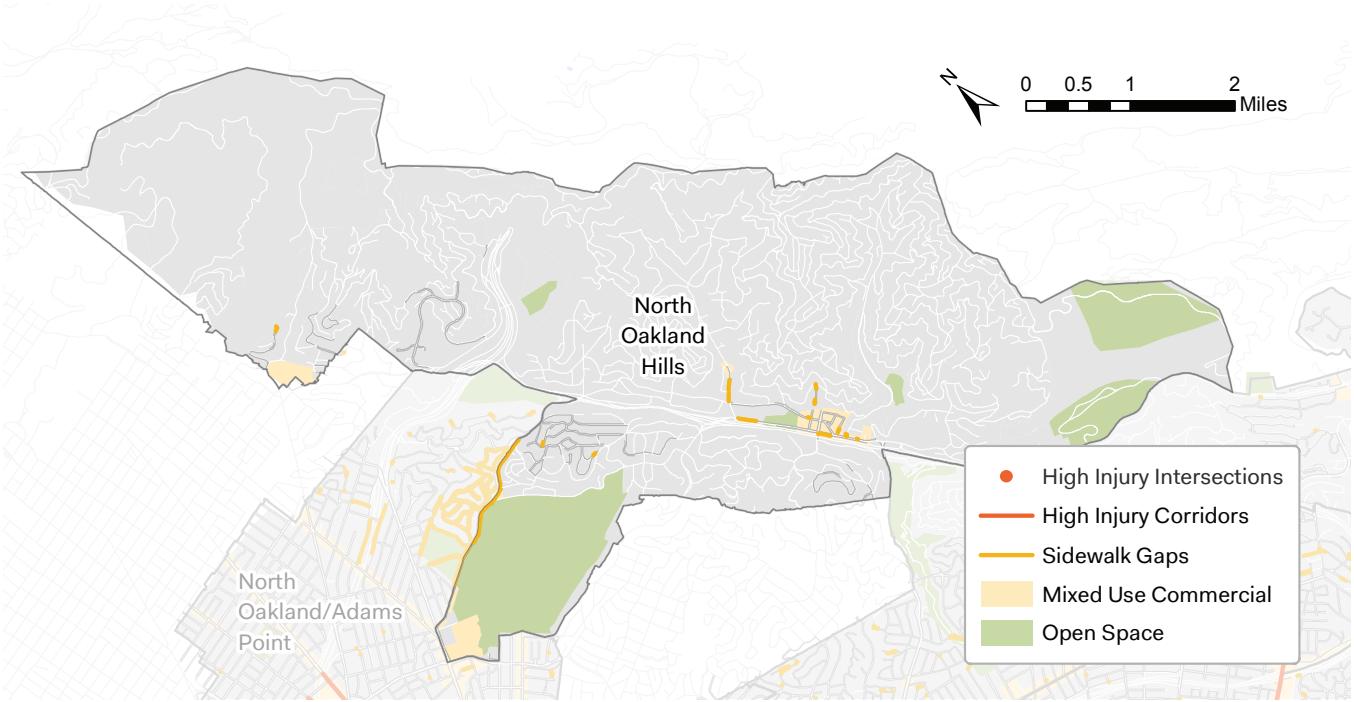


Table 3.13: North Oakland Hills Facilities, Demographics, and Safety

Facilities	Area (sq miles)	Area (% of City)	Sidewalks (miles)	Streets (miles)	Curb ramps ADA (%)	Curb ramps non-ADA (%)	No curb ramp (%)	Signals w/ ped heads	Sidewalk damaged (%)
North Oakland Hills	9	16%	17	131	12%	7%	80%	79%	17%
Citywide	56	100%	1,120	1,002	42%	13%	45%	47%	22%

Demographics	Total pop.	African American (%)	Asian (%)	Hispanic/ Latino* (%)	White (non-Hispanic) (%)	Other (%)	17 and under (%)	65 and over (%)	With a disability (%)	Severely rent burdened (%)
North Oakland Hills	23,587 (6%)	5%	14%	6%	68%	7%	19%	17%	6%	21%
Citywide	402,339	26%	16%	26%	27%	6%	21%	12%	12%	30%

Safety	Avg. fatalities/ year	Avg. severe injuries/year	Total injuries (2008-2014)	Avg. fatalities 100k/year**	Avg. injuries/ 100,000/year	Avg. injuries/ street mile
North Oakland Hills	0	0.3	5	0	21	0.3
Citywide	7	22	267	1.7	66	0.2

* Hispanic indicates the Hispanic Ethnicity category on the Census. Any individual who described themselves as Hispanic plus a race category is included as Hispanic/Latino.

** Some Plan Areas have a larger population than others. These figures measure average fatalities and injuries in a specific Plan Area against Citywide averages.

North Oakland/ Adams Point

North Oakland/Adams Point lies south of Berkeley, east of Emeryville, north and west of Grand Avenue and west of Piedmont. It includes the MacArthur and Rockridge BART stations and the Rockridge, Temescal, Koreatown/ Northgate (KONO), Grand Lake and Piedmont Avenue commercial districts. Nearly half of residents are white. A few North Oakland intersections and corridors–mostly on Telegraph Avenue are among the City's High Injury Network. Additionally, underpasses at Highway 24 and I-980 have limited lighting for pedestrians.

Walk Score®: 83 (Very Walkable)

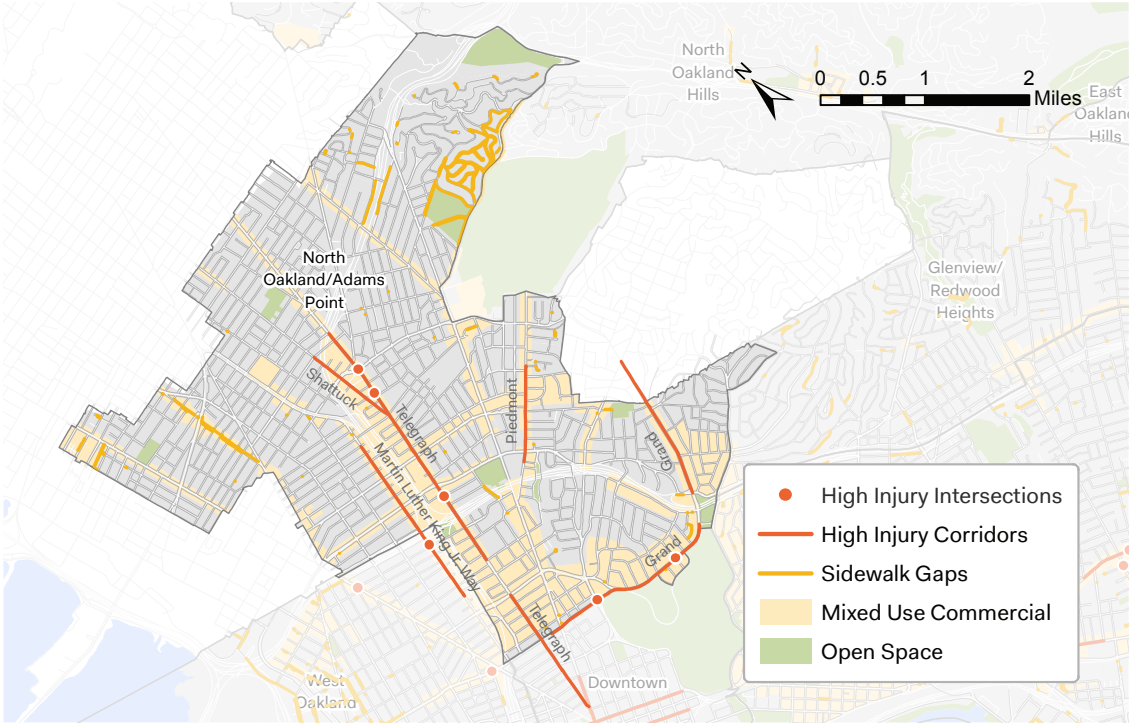


Table 3.14: North Oakland/Adams Point Facilities, Demographics, and Safety

Facilities	Area (sq miles)	Area (% of City)	Sidewalks (miles)	Streets (miles)	Curb ramps ADA (%)	Curb ramps on-ADA (%)	No curb ramp (%)	Signals w/ ped heads	Sidewalk damaged (%)
North Oakland/Adams Point	6	10%	225	139	51%	14%	34%	53%	24%
Citywide	56	100%	1,120	1,002	42%	13%	45%	47%	22%

Demographics	Total pop.	African American (%)	Asian (%)	Hispanic/ Latino* (%)	White (non-Hispanic) (%)	Other (%)	17 and under (%)	65 and over (%)	With a disability (%)	Severely rent burdened (%)
North Oakland/Adams Point	76,770 (21%)	21%	13%	11%	49%	6%	12%	13%	11%	23%
Citywide	402,339	26%	16%	26%	27%	6%	21%	12%	12%	30%

Safety	Avg. fatalities/ year	Avg. severe injuries/year	Total injuries (2008-2014)	Avg. fatalities 100k/year**	Avg. injuries/ 100,000/year	Avg. injuries/ street mile
North Oakland/Adams Point	1	3	48	1.7	63	0.2
Citywide	7	22	267	1.7	66	0.2

* Hispanic indicates the Hispanic Ethnicity category on the Census. Any individual who described themselves as Hispanic plus a race category is included as Hispanic/Latino.

** Some Plan Areas have a larger population than others. These figures measure average fatalities and injuries in a specific Plan Area against Citywide averages.

Downtown

Downtown stretches from the Oakland Estuary to Grand Avenue and from the south shore of Lake Merritt to I-980. At one square mile, this is the smallest of Oakland's nine areas. It contains three BART stations (19th Street, 12th Street, and Lake Merritt), as well as high-activity centers of Downtown, Uptown, Chinatown, Old Oakland, and Jack London Square. Twenty—one percent of Downtown residents walk to work—more than five times the citywide average. Forty-two percent of residents are Asian and Downtown has the lowest share of residents under 18 years old and the highest share of senior citizens. This area has the greatest average of pedestrian injuries per Plan Area—259, where the average is 66.

Walk Score®: 93 (Walker's Paradise)

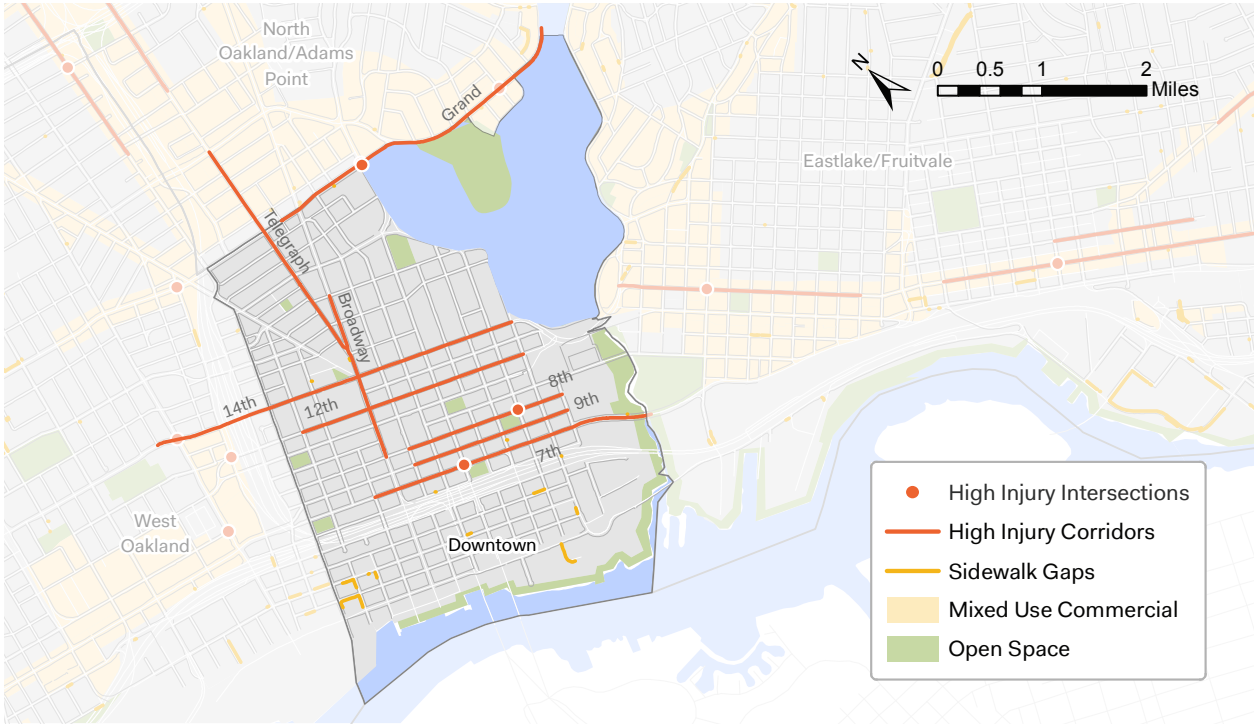


Table 3.15: Downtown Facilities, Demographics, and Safety

Facilities	Area (sq miles)	Area (% of City)	Sidewalks (miles)	Streets (miles)	Curb ramps ADA (%)	Curb ramps non-ADA (%)	No curb ramp (%)	Signals w/ ped heads	Sidewalk damaged (%)
Downtown	1	2%	49	39	59%	32%	9%	37%	17%
Citywide	56	100%	1,120	1,002	42%	13%	45%	47%	22%

Demographics	Total pop.	African American (%)	Asian (%)	Hispanic/ Latino* (%)	White (non-Hispanic) (%)	Other (%)	17 and under (%)	65 and over (%)	With a disability (%)	Severely rent burdened (%)
Downtown	17,688 (4%)	18%	42%	9%	26%	6%	7%	20%	19%	24%
Citywide	402,339	26%	16%	26%	27%	6%	21%	12%	12%	30%

Safety	Avg. fatalities/ year	Avg. severe injuries/year	Total injuries (2008-2014)	Avg. fatalities 100k/year**	Avg. injuries/ 100,000/year	Avg. injuries/ street mile
Downtown	1	2	46	5	259	1
Citywide	7	22	267	1.7	66	0.2

* Hispanic indicates the Hispanic Ethnicity category on the Census. Any individual who described themselves as Hispanic plus a race category is included as Hispanic/Latino.

** Some Plan Areas have a larger population than others. These figures measure average fatalities and injuries in a specific Plan Area against Citywide averages.

West Oakland

West Oakland is located between the Estuary to the south, the Bay to the west, I-80/Bay Bridge to the north and I-980 to the east. It is home to the West Oakland BART station and the Seventh Street commercial corridor. It is one of Oakland's oldest residential areas, amidst heavy industrial uses, including the Port of Oakland and the former Oakland Army Base. West Oakland includes seven intersections and two corridors in the City's High Injury Network. Almost half (46%) of all residents are African American and 32% of households own zero motor vehicles. More residents in West Oakland walk more than 150 minutes per week than in any other Plan Area. Sidewalks are in the poorest shape in the city and this area has the second highest average injury rate, second only to Downtown.

Walk Score®: 42 (Car-Dependent)

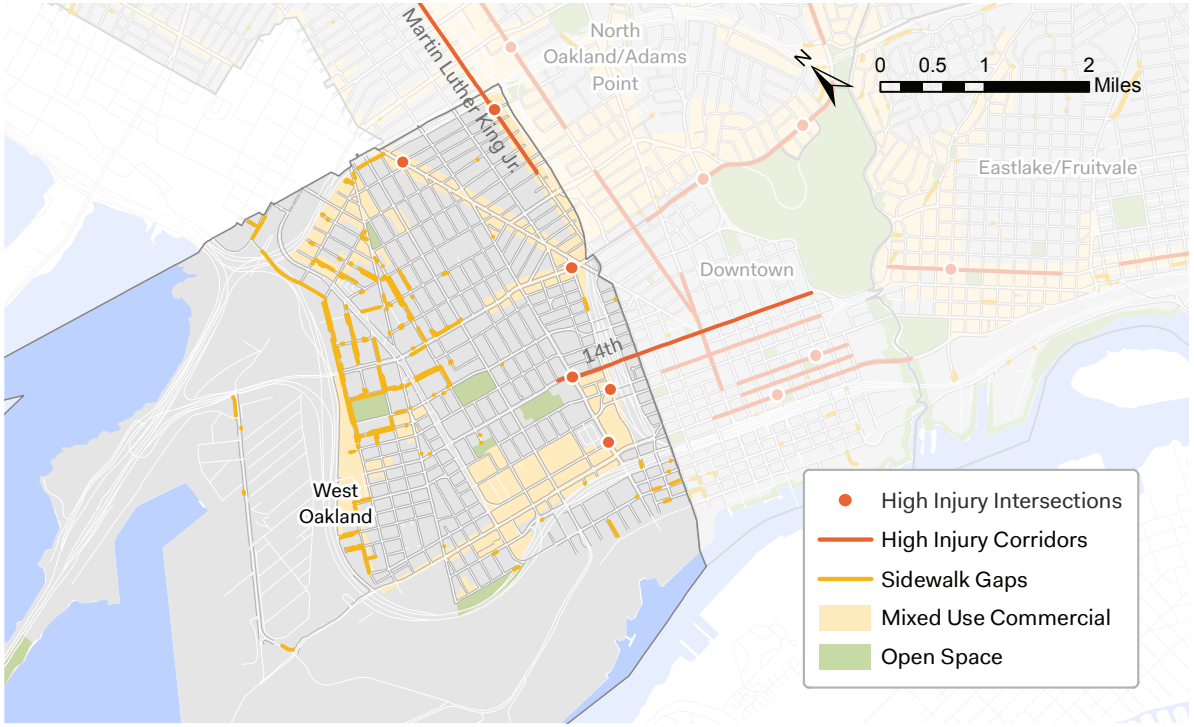


Table 3.16: West Oakland Facilities, Demographics, and Safety

Facilities	Area (sq miles)	Area (% of City)	Sidewalks (miles)	Streets (miles)	Curb ramps ADA (%)	Curb ramps non-ADA (%)	No curb ramp (%)	Signals w/ ped heads	Sidewalk damaged (%)
West Oakland	6	11%	102	98	49%	28%	23%	49%	15%
Citywide	56	100%	1,120	1,002	42%	13%	45%	47%	22%

Demographics	Total pop.	African American (%)	Asian (%)	Hispanic/ Latino* (%)	White (non-Hispanic) (%)	Other (%)	17 and under (%)	65 and over (%)	With a disability (%)	Severely rent burdened (%)
West Oakland	25,067 (6%)	46%	12%	17%	19%	5%	23%	9%	16%	31%
Citywide	402,339	26%	16%	26%	27%	6%	21%	12%	12%	30%

Safety	Avg. fatalities/ year	Avg. severe injuries/year	Total injuries (2008-2014)	Avg. fatalities 100k/year**	Avg. injuries/ 100,000/year	Avg. injuries/ street mile
West Oakland	1	3	24	2.4	96	0.2
Citywide	7	22	267	1.7	66	0.2

* Hispanic indicates the Hispanic Ethnicity category on the Census. Any individual who described themselves as Hispanic plus a race category is included as Hispanic/Latino.
** Some Plan Areas have a larger population than others. These figures measure average fatalities and injuries in a specific Plan Area against Citywide averages.

4. Needs Analysis

This chapter identifies the gap between where Oakland is now and where it needs to be. Policy, planning, and program needs were identified through Plan analysis, the Plan's community engagement process, and an analysis of the city's overall walkability. Note that as described in the Executive Summary, Oakland lacks sufficient operating dollars, which contributes to a deferred maintenance problem.

4.1 Community Engagement

What We Heard from Oaklanders

Oaklanders participated in our survey about their concerns and priorities. Respondents to the survey indicated that speeding, poor lighting, and broken or missing sidewalks were their biggest barriers to walking. They ranked traffic calming and improved lighting as the most important safety improvements. Street fairs and educational campaigns against unsafe driving were the most important programs or policies.

We also met with and heard from the following community groups:

- United Seniors of Oakland and Alameda County
- Asian Health Services
- West Oakland Neighborhood Crime Prevention Council (NCPC)
- Allen Temple Seniors in East Oakland
- Fruitvale Unity NCPC
- San Antonio NCPC
- Northgate NCPC

Meetings with the Technical Advisory Committee (TAC) and Pedestrian Advisory Group (PAG)

Staff held four meetings with the TAC and PAG to inform the development of this Plan. The TAC and PAG asked the City to add case studies to the Plan, identify performance measures for success, review best practices from other cities, and link the pedestrian environment to land use. Both committees requested that safety improvements be focused on engineering solutions instead of pedestrian behavior.

Other Concerns Heard at Community Meetings

Some Oakland residents who spoke at the Neighborhood Crime Prevention Council (NCPC) meetings recounted instances of their walks being blocked by garbage that had been illegally dumped. Some residents also spoke about the presence of homeless encampments as a deterrence to walking. Other meeting attendees indicated that fear of crime is the biggest deterrent to walking at night.

4.2 Policy Needs

Policies can help translate the broad focus of plan efforts like the 2017 Pedestrian Plan into discrete priorities, especially if deemed appropriate by elected officials. Policies provide necessary direction for staff to implement projects and programs that support Plan goals and objectives.

Adopt a Vison Zero Policy and communication strategy.

Vision Zero is a policy with a goal to eliminate all traffic fatalities and severe injuries, while increasing safe, healthy, equitable mobility for all. First implemented in Sweden in the 1990s, Vision Zero brings multidisciplinary stakeholders together to acknowledge that traffic deaths and severe injuries are preventable and to set a shared goal of eliminating traffic deaths and severe injuries in a set time frame with clear, measurable strategies. As an important proactive step toward eliminating all traffic injuries and fatalities in Oakland, the City's elected officials could direct staff to hire a Vision Zero coordinator, convene a committee of transportation, planning, police, fire, school and public health representatives to work toward adopting a citywide Vision Zero Policy, and take the steps recommended by the committee to achieve Vision Zero in Oakland.

4.2 Policy Needs (continued)

Implement a Pedestrian Signal Policy that prioritizes pedestrian safety.

Traffic signals regulate the essential right of way for city streets and hold a critical role in creating new rules for safety on Oakland's streets. Signals must also be engineered to balance the needs of transit, pedestrians, bicycles, and the changing flow of vehicles at different times of the day. While Oakland has 667 signalized intersections, 47% have pedestrian signals (known as "ped heads") and only 15% of these signals are timed for walking speed and include countdown signals. This Plan's safety analysis revealed a concentration of pedestrian crashes at signalized intersections. A review of signal timing at these intersections could identify the extent to which operational characteristics such as turning vehicles during pedestrian walk phases, length of pedestrian walk time, and long signal cycles, are contributing to pedestrian-vehicle crashes.

Develop, enforce, and refine a Temporary Traffic Control Policy for construction activities that impact the pedestrian environment.

Chapter 6 of the California Manual on Traffic Control Devices (MUTCD) specifies that bicyclists and pedestrians must be safely accommodated through construction zones. In 2017, the City issued supplemental guidance, specifying that sidewalk detours are generally not acceptable in downtown Oakland nor in areas where pedestrian activity occurs.[9] Maintaining, enforcing, and refining this policy is a need for the City.

9. To learn more about Oakland's Temporary Traffic Control policy visit: http://www2.oaklandnet.com/oakca1/groups/pwa/documents/memorandum/oak062315.pdf.

What's the deal with "beg buttons?"

At some intersections in Oakland, the traffic signals do not allow a pedestrian to cross unless someone presses a button on the signal pole. At these "pedestrian-actuated signals," pedestrians have to "beg" the signal to let them cross—hence the term "beg button."

Oakland's traffic signal policy states that downtown intersections should always include a pedestrian crossing phase. This means that you should never have to press the button to get a pedestrian walk signal in downtown Oakland. Even if you see a "beg button," you don't have to beg! Below are some other traffic signal features that are being incorporated into new, or significantly upgraded, traffic signals:

Signal Type:

Rest in walk: Signal stays in pedestrian walk mode along major streets until there is sufficient time to cross the street.

Hot response walk time trigger extension: Allows pedestrians to trigger a "Walk" phase once a minimum allowable green time is provided for conflicting vehicles.

Leading pedestrian intervals: Gives pedestrians a head start across signalized intersections where frequent conflicts with turning motor vehicles occur.

Establish policies to clarify that enforcing traffic safety should not be based on racial profiling.

In 2014, the City of Oakland partnered with Stanford's SPARQ (Social Psychological Answers to Real-world Questions) program to examine the relationship between the Oakland Police Department (OPD) and the Oakland community and to develop evidence-based strategies for any racial disparities that emerged. The report found that OPD officers stopped, searched, handcuffed, and arrested more African Americans than whites and that African American men were four times more likely to be searched than whites during a traffic stop. This was consistent even when the researchers controlled for variables such as the crime rate.[10] Enforcement, while an important tool in pedestrian safety, must be applied in a method that does not create further racial disparities. Acknowledging these known issues, Oakland could establish a policy that enforces traffic safety without further impacting racial disparities or racial profiling.

Work with advocates to change state laws related to speed limits and automated speed enforcement. Additionally develop local policies augmenting the California Manual on Uniform Traffic Control Devices.

To set speed limits in Oakland, the DOT must follow state law which requires that speed limits be set based on the "prevailing speed." The prevailing speed is determined by a field survey along a road of vehicle speeds and calculation of the 85th percentile speed. For example, if 100 vehicle speeds are plotted, the speed limit would be set to the speed at or near the speed of the 15th fastest vehicle. Minor rounding is allowed, but nothing more than 5 mph. This is why many traffic engineers are reluctant to perform additional speed surveys. In California there is an exception the prevailing speed/85th percentile law: school zones are exempt from speed surveys and can mandate 25 mph when children are present.

Currently, automated speed enforcement (ASE) is not legal in the state of California, although it has worked in several other municipalities as a tool that can reduce speed. Oakland could work with advocates to change state law to allow ASE. This could also avoid the implicit bias that can occur in police enforcement given that the camera sees a license plate, not a face.

The California Manual on Uniform Traffic Control Devices (CA MUTCD) provides uniform standards and specifications for all official traffic control devices in California. While the manual is the official guide for traffic control, it often lacks local context. Oakland could develop specific standards that augment existing CA-MUTCD guidance, such as establishing a maximum distance between protected pedestrian crossings in commercial districts, along residential arterials, and near schools.

10. See Strategies for Change: Research Initiatives and Recommendations To Improve Police-Community Relations in Oakland, CA (June 2016) and Data for Change: A Statistical Analysis of Police Stops, Searches, Handcuffings, and Arrests in Oakland, Calif., 2013-2014 (June 2016).

4.3 Planning and Analysis Needs

In developing the 2017 Pedestrian Plan, several areas were identified for further evaluation, study, and analysis.

Implement improvements to high injury corridors and intersections

"Chapter Two: Safety" identifies the High Injury Network. These streets make up only 2% of Oakland's street networks yet result in 36% of pedestrian collisions. The High Injury Network was identified by analyzing seven years of pedestrian crashes (2008-2014) and the physical characteristics of the roadway. Overall, this analysis identified 34 high-injury corridors and 37 high-injury intersections (see Table 2.2). The City should identify long term and shorter term countermeasures to improve pedestrian safety at these locations.*

Staff should update the list of corridor and intersection locations for improvements over time. This will allow staff the flexibility to add new projects as the initial list of projects are completed or as new needs are identified. Changes or additions to the list will be made in accordance with the prioritization method established in Chapter 6.

*Note: Recommendations pertaining to types of capital projects cost, timeline or phasing, and potential funding sources that are necessary to implement 2017 Pedestrian Plan goals are contained in the Appendix B, and are not considered to be adopted as part of this Plan's scope.

Update City Tree Plan

The iconic symbol of the City of Oakland is an oak tree, like the one that graces City Hall's front lawn. Trees provide shade, create a visual buffer against motor vehicle traffic, and make walking more interesting. Numerous studies have found that people drive slower on streets with trees, thus reducing the number and severity of collisions with people walking. In general, planting should be focused in roadway medians and bulb-outs throughout the city, while investment in the maintenance should be increased for existing and new street trees. At the same time, a broader evaluation and prioritization of resources is needed: the City could complete a full tree inventory and create an urban forest master plan, which could include recommended street tree planting locations. Recognizing that Oakland has limited budget for operations, the City could work with community members to develop innovative ideas on tree maintenance.

Update ADA Transition Plan

Creating a fully accessible city is not only a policy goal, it's a legal requirement. Oakland's streets and sidewalks are the source of many of the City's liability claims and lawsuits because they are cracked, uneven, or in need of updating.** Oakland could update its ADA Transition Plan and identify, prioritize, and construct the projects needed to implement the Plan. Additionally, focusing on other pedestrian facilities not identified in the ADA Transition Plan such as lighting, access to bus stops, benches, bus shelters and other resting places, and sidewalk condition serves people with disabilities as well as other vulnerable populations such as the elderly and children.

**Trip and Fall Claim & Lawsuit Payouts

Calendar Year	#	Total Dollar Amount Paid	Average payout
2008	30	$240,480.00	$8,016
2009	37	$985,035.74	$26.622.59
2010	35	$542,851.75	$14,671.67
2011	30	$534,662.00	$17,822.07
2012	24	$1,183,142.16	$49,297.59
2013	19	$791,017.28	$41,632.49
2014	19	$477,620.65	$25,137.93
Total	194	$4,754,809.58	$24,509.33

Adopt A Spot Public Art

Public art can help to create a vibrant and welcoming environment for people walking, while also serving as a public expression of Oakland's artistic talent. Oakland's award-winning Adopt a Spot program supports individuals, neighborhood groups, civic organizations, and businesses in ongoing cleaning and greening of parks, streets, trails, medians and other public spaces. Volunteers have adopted hundreds of sites around Oakland. Public Works can provide tool loans, debris collection services, and technical assistance. Oakland volunteers add beauty and character to the streets by adopting and adorning City-owned litter containers with tile mosaics and painted murals.

Marina Kukso

For More Information:

http://www2.oaklandnet.com/government/o/PWA/o/FE/s/ID/OAK024735#Adopt a Spot

Evaluate lighting to improve pedestrian security

A well-lit street is a street that feels safe. In a city with limited resources, improved lighting installations should focus on locations with higher-than-average pedestrian volumes, such as downtown sidewalks and bus stops. At the same time, a lighting study that works with the Oakland community could measure the current lumen levels on Oakland sidewalks, determine where minimum levels are not being met, and identify needed investments to bring all sidewalks up to minimum standards using pedestrian-scale lighting or improved street lighting. Based on the study findings, new lamps could be installed and existing ones adjusted to create well-lit corridors for walking throughout Oakland.

4.4 Program Needs

Programs help the City prioritize and systematize implementation of specific categories of projects. The following programs have been identified as success stories in other cities and could be incorporated into the City's Pedestrian Program to help execute the Plan goals. Additionally, to achieve the Equity Goal in this Plan, Oakland could consider equity analyses to inform program needs. This could include exploring how public space art programs could prioritize art in low income communities and communities of color, or to consider language translation in a way finding program. In developing program needs, Oakland could develop programs by prioritizing those who are most vulnerable.

Establish a 25 mph zone program

How fast a driver operates his or her vehicle is one of the single most important determinant of whether a crash will occur and the severity of the damage and injuries it could cause. A pedestrian struck by a vehicle going 30 mph has a 20% chance of dying, while one struck by a car going 25 mph has only a 12% chance of death. Combining safety analysis and community input, a

4.4 Program Needs (cont.)

program to establish 25 mph zones on prioritized streets—and to implement engineering solutions to self-enforce lower speeds—could save lives in Oakland neighborhoods.

Create a public space program

Art allows us to see the extraordinary in the ordinary. In cities, nothing is more ordinary than transportation infrastructure. Many cities are placing art into everyday transportation infrastructure such as crosswalks. Oakland DOT could create a policy on creative crosswalks and community led art to encourage creativity and place making in the City's right of way.

Develop a program to support low-income property owners in repairing sidewalks

Oakland's sidewalks are the source of many of the City's liability claims. Many of Oakland's sidewalks are cracked, uneven, or in need of significant updating. But sidewalks are the property owners' responsibility, and replacing concrete sidewalks can be an incredible expense on cost-burdened property owners. Currently, the City offers property owners the option of using a City contractor to repair the sidewalks, which costs significantly less than a private contractor. Additionally, the property owner can opt to have a lien put on their property so that the sidewalk repair is captured at the time of sale. While the City has the authority to require that property owners pay for repaired sidewalks, the City could learn from successful programs in cities like New York, where the City assists low-income property owners in repairing their sidewalks through low-interest loans, or the City could establish a fund for low-income property owners.

Expand neighborhood traffic calming program

Oakland's existing neighborhood traffic calming program could be expanded to proactively identify neighborhood traffic calming opportunities and prioritize implementation according to need.

Develop a Safe Routes to Transit program

A corollary to a Safe Routes to School program, an Oakland Safe Routes to Transit program would partner closely with Oakland's transit agencies to identify pedestrian connectivity and safety improvements at and around bus stops and transit stations. Combining forces with Oakland's transit agency partners might also increase funding opportunities.

Support development of a citywide pedestrian wayfinding program

How do you know where you're going in Oakland? Clear signage that directs both visitors, vulnerable populations such as persons with disabilities, and regulars to common destinations supports walking in Oakland and could be a program priority.

Add maintenance staff to maintain roadway features that reduce speeds and make pedestrian crossings safer

The City of Oakland currently receives more requests for maintenance of pedestrian facilities than can be met in a timely manner, so there is little opportunity to be proactive about preventative maintenance checks. Maintenance needs include refreshing crosswalks (particularly on pavement of poor quality and in areas with large volumes of truck traffic), ensuring that the walk phases of traffic signals are sufficient and that the walk/don't walk function is operational, and responding quickly to reports of non-functioning equipment. Oakland could hire additional full time staff over the course of five years to refresh crosswalks and maintain signal equipment.

Chinatown Pedestrian Scrambles

Oakland Chinatown did not always have the decorative crosswalks seen today. A man who was hit and killed at the corner of Webster and 8th street, galvanized Julia Liou of Asian Health Services and the Chinatown community to transform the pedestrian environment. Asian Health Services serves the Asian and Pacific Islander community by guaranteeing access to health care services regardless of income, language, immigration status or culture. Although Asian Health Services had never participated in pedestrian advocacy before, the link between health and transportation was clear: a safer pedestrian environment could encourage more walking and reduce fatalities. Liou spearheaded the advocacy for pedestrian scrambles and convinced City Council members and policy makers to support the design changes. Former Councilman Danny Wan also championed the project and convinced the Chinatown Chamber of Commerce that a safer pedestrian environment would bring more visitors by foot and be good for business.

Kerby Olsen

A trial at 8th and Webster convinced Oakland traffic engineers that the design was safe for drivers and pedestrians. The success spurred Liou, the Chinatown Chamber of Commerce, and Councilmember Wan to apply for a federal grant to expand the scope in what became known as Revive Chinatown. This community-led process identified the project design and the Qiling good-luck charm on corresponding signage. The Metropolitan Council awarded a $2.2 million dollar grant in 2004 to transform four crosswalks, add pedestrian scale lighting, and re-time pedestrian signals. The new crosswalks have resulted in a friendlier, more visible and economically vital pedestrian environment.

4.5 Data & Process Needs

To implement the Plan, the City could develop and implement better data management practices and improved workflow processes. These improvements will help guide planners and engineers in identifying needed safety treatments, developing prioritization assessments, and guiding overall decision-making. Predictable processes can also be used to convey this decision-making back to the community to provide accountability.

Develop quantitative equity metrics

Oakland could develop quantitative equity metrics to guide project development and capital improvement prioritization and to evaluate program effectiveness.

Apply Pedestrian Strategy and Solutions Toolbox

Many intersections in Oakland have similar characteristics and similar safety outcomes. A pedestrian safety toolkit would help planners and engineers quickly identify appropriate safety treatments based on the characteristics of the intersections and underlying safety concerns, taking into consideration factors such as overall vehicle speeds and pedestrian crash history (See Appendix C).

Treatments include updating signals to include

4.5 Data & Process Needs (continued)

exclusive pedestrian phasing (sometimes referred to as a pedestrian scramble), installing raised pedestrian crossings, and refuge islands amongst other tools.

The toolkit provides cost estimates for various interventions. This toolkit also serves as a useful reference for community members interested in improving safety in their neighborhoods, as it clearly identifies a feasible set of possible engineering solutions.

Create and maintain a transportation safety data inventory

Oakland's decisions about where and how to invest in pedestrian safety improvements should be informed by data analysis. Creating and maintaining a transportation safety data inventory is a necessary step toward a data-driven organization. Ensuring that this data inventory is also easily available to the public will help democratize this vital information and hold decision-makers accountable.

Oakland Public Library, 2014

5. Recommended Actions

This chapter describes recommended actions that will help Oakland accomplish the Plan's four goals during the next five years. Actions are grouped by outcome, and cost estimates are provided for capital and operations.

5.1 Becoming a More Walkable City

This chapter answers the question: how can the City make streets safer, more comfortable and more convenient for people walking throughout all parts of Oakland? It presents a set of 39 recommended actions, each intended to help accomplish one or more of the Plan's four goals:

Equity (E): Recognizing a historical pattern of disinvestment, focus investment and resources to create equitable, accessible walking conditions to meet the needs of Oakland's diverse communities.

Holistic Community Safety (S): Make Oakland's pedestrian environment safe and welcoming.

Vitality (V): Ensure that Oakland's pedestrian environment is welcoming and well connected, supports the local economy, and sustains healthy communities.

Responsiveness (R): Develop and provide tools to ensure that Oakland creates and maintains a vibrant pedestrian environment.

Each action meets one or more of the four goals that achieve the vision of the 2017 Pedestrian Plan. The actions are organized around the following outcomes:

Outcome 1: Increase Pedestrian Safety

Outcome 2: Create Streets and Places that Promote Walking

Outcome 3: Improve Walkability to Key Destinations

Outcome 4: Engage the Oakland Community in Creating Vibrant Pedestrian Environments

Outcome 5: Improve metrics, evaluations, funding and tools for creating pedestrian environments

The recommendations outlined in this chapter are derived from Plan findings, survey responses, community meeting input, advisory committee guidance, and the Plan's Vision and Goals. These recommendations are intended for implementation over the next five years (Plan horizon).

5.2 Costs

This section provides cost estimates of the actions under each outcome. Costs are reported in the following categories:

- **Capital:** Expenses to deliver projects thought likely to attract outside grant funding, including design and construction. This work could be performed by outside contractors or City staff.
- **Operating:** The cost to maintain roadway features that reduce speeds and make pedestrian crossings safer. Additionally, the cost of creating new staff positions needed to carry out the Plan's recommended actions.

For each of the recommended actions laid out in the previous chapter, Table 5.1 shows the estimated costs that are expected to be eligible for grants, new costs that would not likely attract outside funding, and the total cost.

Delivering the Plan's recommended actions is expected to cost a total of $109 million (see Table 5.1). Of this, $40 million are costs for which the City of Oakland typically is successful in attracting outside grant funding.

In contrast, $59 million of the anticipated total cost is for new program development and maintenance staff, of which $52 million is not expected to be covered by outside grants.

While local revenue sources such as Measure B/BB funds can cover about $5 million of these costs, the City estimates $52 million is needed to plan, develop, and maintain Oakland's pedestrian realm at a level that makes walking feel safe and inviting to people in all Oakland neighborhoods (see Table 5.2).

Table 5.1: Total Estimated Lifecycle Costs

Capital	Operating	Total
$ 52,600	$ 56,740	$ 109,340

*Costs (in 1000s)

Table 5.2: External Funding Sources

	Est Need	Grant Eligible	Measure B/BB	I-Bond	Remainder
Capital	$ 52,600	$ 40,000	$ -	$ 12,600	$ -
Operating	$ 56,740	$ -	$ 5,000	$ -	$ 51,740
Total	$ 109,340	$ 40,000	$ 5,000	$ 12,600	$ 51,740

Lifecycle Costing

Lifecycle costing is a way of estimating the cost of a particular investment by considering not just the initial purchase price, but also operation and maintenance costs throughout its expected lifetime.

For capital expenditures such as sidewalks, crosswalks and traffic signals, this may mean investing in longer lasting materials to reduce overall maintenance costs (e.g., concrete rather than asphalt). These projects may be more costly to construct, but because they will be less expensive to operate and maintain, they may cost the City less over the life of the investment. Involving maintenance staff during facilities' design stages can help with this assessment.

Example Table

No.	Action	Equity (E)	Safety (S)	Vitality (V)	Responsiveness (R)	Capital	Operating
1.	*Example Action*		x			$ 15,000	$ -
2.	*Example Action*			x	x	$ 900	$ 54

*Costs (in 1000s)

Outcome 1: Increase Pedestrian Safety

In order to achieve this outcome, the City will install pedestrian safety improvements in high injury corridors, develop new policies, adopt Vision Zero, upgrade signals and other infrastructure, work to reduce vehicle speeds, improve lighting, and explore ways to equitably enforce traffic laws.

No.	Action	E	S	V	R	Capital	Operating
1.	Implement improvements to High Injury Corridors and Intersections		x			$ 15,000	$ -
2.	Adopt a Vison Zero Policy and communication strategy					$ 900	$ 150
3.	Implement a pedestrian signal policy that prioritizes pedestrian safety		x			$ -	$ 20
4.	Implement a temporary traffic control protocol for new developments that impact the pedestrian environment		x			$ -	$ 10
5.	Establish 25 mph zone program		x	x		$ -	$ 20
6.	Improve security for pedestrians through lighting	x	x			$ 7,400	$ -
7.	Work with the Department of Race and Equity and the Police Department to enforce traffic safety that does not further impact racial disparities or racial profiling	x	x			$ -	$ -
8.	Work with advocates to change state laws related to speed limits and automated speed enforcement. Additionally, develop local policies augmenting the California Manual on Uniform Traffic Control Devices.		x			$ -	$ 40
9.	Implement the pedestrian safety toolkit		x			$ 3,000	$ 20
10.	Maintain roadway features that reduce speeds and make pedestrian crossings safer		x			$ -	$ 55,000
	Total					**$ 26,300**	**$ 55,260**

Key:
E = Equity
S = Safety
V = Vibrancy
R = Responsibility

Outcome 2: Create Streets and Places that Promote Walking

To achieve this objective, the City will integrate safety into the design of new streets incorporate art into pedestrian infrastructure, plant more street trees, repair sidewalks, install accessible curb ramps and other features to improve the pedestrian environment for vulnerable populations, and provide public open space in underutilized roadways. The City will also pursue citywide programs and partnerships with nonprofits and community groups to promote walking.

No.	Action	E	S	V	R	Capital	Operating
11.	Integrate pedestrian safety into street design guidelines when developed		x	x		$ -	$ 10
12	Update the street tree element of the City Tree Plan	x		x		$ 400	$ -
13.	Integrate art and playfulness into pedestrian infrastructure			x		$ -	$ 10
14.	Update the ADA Transition Plan and carry out its recommendations		x	x		$ 7,500	$ -
15.	Create a public space program	x		x		$ -	$ 40
16.	Partner with public health advocacy groups to promote the health benefits of walking			x		$ -	$ 20
17.	Find resources for the City's Façade Improvement Program to support a program to support low-income property owners in repairing sidewalks	x	x	x		$ -	$ 50
18.	Partner with violence prevention advocates, OPD, and other community groups to address the link between safety and walking	x	x	x		$ -	$ 20
19.	Find resources to do regular illegal dumping cleanup	x	x	x		$ -	$ -
	Total					**$ 7,900**	**$ 150**

Key:
E = Equity
S = Safety
V = Vibrancy
R = Responsibility

Outcome 3: Improve Walkability to Key Destinations

To improve walkability to key destinations, the City will develop a prioritization strategy to best focus the benefits of the Safe Routes to School program, establish a similar program focused on first and last mile access to transit, support wayfinding efforts that can be used by vulnerable populations, and identify strategies for improving the walking environment in and near Caltrans-owned rights-of-way, such as underneath freeway overpasses, on and off ramps, and streets where the surface grade is un-even due to railroad tracks. Additionally, the City will use Walk Score® to improve walkability to key destinations and to enhance areas where car-ownership and usage is lower than the citywide average.

No.	Action	E	S	V	R	Capital	Operating
20.	Develop a prioritization strategy for implementing the City's Safe Routes to Schools program		x	x		$ 5,600	$ 20
21.	Create a Safe Routes to Transit Program		x	x		$ -	$ 30
22.	Support the development of a Citywide Pedestrian Wayfinding program			x		$ -	$ 20
23.	Identify missing sidewalk connections and prioritize for improvement	x	x	x		$ 4,000	$ -
24.	Improve pedestrian environment under and over freeways	x	x	x		$ 2,000	$ 20
25.	Increase travel options between transit and major job, education, neighborhood retail, and neighborhood centers	x	x	x		$ 2,000	$ -
	Total					**$ 13,600**	**$ 90**

Key:
E = Equity
S = Safety
V = Vibrancy
R = Responsibility

Outcome 4: Engage the Oakland Community in Creating Vibrant Pedestrian Environments

To achieve this objective, the City will reinvigorate existing communication methods and establish new protocols for engaging about pedestrian projects and enabling community-determined pedestrian projects. The City will also partner with groups that specialize in addressing specific vulnerable populations, for example, the Mayor's Commission on Persons with Disabilities, to understand to the experiences of persons with disabilities.

No.	Action	E	S	V	R	Capital	Operating
26.	Use old and new media including social media and other web tools to connect with Oaklanders on pedestrian topics				x	$ -	$ 20
27.	Partner with neighborhood groups to perform walk audits	x	x	x		$ -	$ 60
28.	Expand neighborhood traffic calming programs citywide	x	x	x		$ 3,800	$ 40
29.	Support constituent-led initiatives to improve safety	x	x	x		$ 900	$ 20
30.	Develop a comprehensive campaign for safety education		x		x	$ 100	$ 40
	Total					**$ 4,800**	**$ 180**

Key:
E = Equity
S = Safety
V = Vibrancy
R = Responsibility

Sergio Ruiz

Outcome 5: Improve Metrics, Evaluations, Funding and Tools for Creating Pedestrian Environments

For this outcome, the City will develop and implement a host of data collection, data analysis, and data reporting efforts, as well as ensure adequate staff training in pedestrian design standards to ensure that the Plan implementation is efficient, accountable, effective, and equitably distributed.

No.	Action	E	S	V	R	Capital	Operating
31.	Update and maintain the City's sidewalk inventory				x	$ -	$ 90
32.	Evaluate and implement process improvements to the City's complaint-based traffic maintenance program	x			x	$ -	$ 20
33.	Integrate before and after pedestrian safety evaluations into all transportation projects				x	$ -	$ 400
34.	Conduct routine pedestrian counts				x	$ -	$ 400
35.	Train staff in national best practices for safe street design and management				x	$ -	$ 60
36.	Create a transportation safety data inventory and make it easily accessible to the public		x		x	$ -	$ 80
37.	Improve process for pedestrian safety improvement requests	x			x	$ -	$ 10
38.	Work with the Department of Race & Equity to define equity for Oakland and develop quantitative equity metrics	x			x	$ -	$ 40
39.	Use data-driven approaches to prioritize and routinize pedestrian safety improvements	x	x		x	$ -	$ 10
	Total					**$ -**	**$ 1,110**

Key:

E = Equity

S = Safety

V = Vibrancy

R = Responsibility

6. Prioritizing Improvements

This chapter describes the methodology that will be used by staff to maintain and update the City's High Injury Network. There are three analyses used in this Plan to identify and prioritize areas of highest need:

(1) A safety analysis
(2) An equity analysis
(3) A walkability analysis

BayRaised

6.1 Methodology

Implementing the improvements identified in this Plan has been estimated to cost more than 100 million dollars over five years. Given this large investment of City resources, this Plan proposes to first invest in the areas of the city most in need of improvements to the pedestrian environment. Staff will use this methodology to maintain and update the High Injury Network. While all corridors listed are a high priority, this methodology will aid staff in determining which intersections and corridors to invest in first. The safety and equity analysis are more heavily weighted (by a factor of five) than the proximity to destinations analysis. There are three analyses used in this Plan to identify areas of highest need:

Safety Analysis

What are the environmental factors? How severe are the pedestrian injuries?

\+

Equity Analysis

Which communities are the most and the least disadvantaged?

\+

Proximity to Destination Analysis

Is the area car dependent? Or is it a walker's paradise?

= **Priority Corridors & Intersections**

6.2 Safety Analysis

This Plan performed a safety analysis to identify the City's high injury corridors and intersections (see Map 2.1 High Injury Network). This analysis evaluated the safety performance of intersections and corridors across the city using collision data from 2008-2014. The safety prioritization score (Safety Score), is determined using two different scores:

- Severity Score
- Risk Factor Score by Location

These scores are added together to create a Safety Score for each intersection and corridor:

Safety Score	Priority
0	Low
1	Medium
2	High

Severity Score

The first score is based on where collisions have historically occurred. Intersections and corridors with a history of fatal and severe pedestrian injuries are weighted more heavily than those with only minor injuries. Crashes within 50 feet of an intersection were assigned to an intersection, and crashes occurring more than 50 feet away from an intersection were assigned to a corridor.

Risk Factor Score by Location

By analyzing historical pedestrian collisions in Oakland, risk factors were identified for corridors and for intersections. These are listed below in Table 6.1. Some risk factors apply to both intersections and corridors and others apply only to an intersection or corridor.

Each intersection and corridor was then assigned a score based on the number of risk factors present. The more risk factors, the higher the score. This score was added to the Severity Score for a maximum score of 2.

Table 6.1 Breakdown of Risk Factor Score by Location

Risk Factor	Intersection	Corridor
Arterial Functional Classifications	X	X
Four or More Undivided Lanes		X
Four or More Lanes on Major Street	X	
Lack of Median Presence		X
High Frequency of Transit Stops		X
Lack of Pedestrian Countdown Presence at Signals	X	X
Lack of Pedestrian Signal Head Presence at Signals	X	X
Lack of Pedestrian Actuation at Signals	X	X
Offset/Closely-Spaced Intersections	X	

TakaTaira Photos, 2016

6.3 Equity Analysis

An equity analysis was used to identify the areas of the city where residents face potential socioeconomic disadvantages. This equity analysis used the same factors developed by the Metropolitan Transportation Commission (MTC) to identify the Bay Area's "Communities of Concern." MTC identified these communities using a set of eight demographic characteristics. These are:

- Race/Ethnicity
- Low Income (<200% of Poverty) Population
- Limited English Proficiency Population
- Zero-Vehicle Households
- Seniors 75 and Over
- Population with a Disability
- Single-Parent Families
- Severely Rent Burdened Households

Equity Score	Priority
0	Low
1	Medium
2	High

For this Plan, an equity index was calculated by summing each of the eight population characteristics in a Census Block Group[11] and then dividing the sum by the population of the Block Group. For example, a person who is low income and over 75 is counted twice in this methodology; therefore the more factors present in an area, the deeper the disadvantage. The equity score ranges from 0-2, where 2 represents the areas in the city with the most disadvantage and 0 represents the least. For a Map of Oakland's Communities of Concern see Map 3.2. The following are the areas in Oakland represent the most disadvantaged areas in the city:

- Central/East Oakland
- Eastlake/Fruitvale
- West Oakland
- Coliseum/Airport
- Downtown

Oakland Public Library, 2016

11. A Census Block Group is a geographical unit used by the United States Census Bureau which is between the Census Tract and the Census Block. It is the smallest geographical unit for which the bureau publishes sample data, i.e. data which is only collected from a fraction of all households.

6.4 Proximity to Destinations

Walk Score® is an application that categorizes whether a location is walkable. Walk Score® determines if a place is walkable by analyzing potential walking routes to nearby amenities including transit stops and stations, schools, grocery stores, restaurants, and parks. Points are awarded based on the distance to amenities in various categories and pedestrian friendliness. Pedestrian friendliness is measured by analyzing population density, intersection density and block length.

This Plan used Walk Score® data to create a walkability score because it is a simple measure that many community members are familiar with.

The Plan prioritizes areas that are more walkable (Walker's Paradise) because a higher Walk Score® indicates more pedestrian attractions such as schools, transit, grocery stores and parks.

Table 6.2 Walk Score® Categories

Walk Score®	Description
90-100	Walker's Paradise Daily errands do not require a car
70-89	Very Walkable Most errands can be accomplished on foot
50-69	Somewhat Walkable Some errands can be accomplished on foot
25-49	Car-Dependent Most errands require a car
0-24	Car-Dependent Almost all errands require a car

Walk Score® data was normalized to create a prioritization score with the following scale:

Walk Score®	Walk Score®	Priority
0-49	0	Low
50-89	1	Medium
90-100	2	High

6.5 Pedestrian Priority Analysis for High Injury Intersections and Corridors

Table 6.3 High Injury Corridors

Tier	Street Name	Start	End	Weighted Safety Score	Weighted Equity Score	Walk Score®	Total
High	International Blvd	High St	Fruitvale Ave	7.90	8.57	1.85	18.33
High	Foothill Blvd	Mitchell St	40th Ave	8.69	7.51	1.75	17.95
High	Broadway	9th St	19th St	8.05	7.62	1.99	17.66
High	International Blvd	High St	56th Ave	9.14	6.70	1.67	17.50
High	MacArthur Blvd	Foothill Blvd	82nd Ave	7.92	7.04	1.50	16.46
High	International Blvd	73rd Ave	91st Ave	7.50	7.45	1.49	16.44
High	8th St	Franklin St	Fallon St	7.01	7.39	1.91	16.31
High	International Blvd	16th Ave	28th Ave	8.05	6.30	1.73	16.07
High	Foothill Blvd	51st Ave	Seminary Ave	7.27	7.29	1.50	16.06
High	Martin Luther King Jr Way	29th St	40th St	7.33	6.65	1.72	15.70
High	9th St	Franklin St	Fallon St	6.38	7.39	1.91	15.68
High	Bancroft Ave	Church St	80th Ave	6.95	7.06	1.52	15.53
High	98th Ave	A St	MacArthur Blvd	7.14	6.81	1.40	15.35
High	International Blvd	95th Ave	Durant Ave	7.04	6.59	1.57	15.20
High	International Blvd	1st Ave	12th Ave	6.44	6.96	1.73	15.12
High	14th Ave	Myrtle St	Oak St	6.44	6.61	1.91	14.95
High	Telegraph Ave	William St	27th St	7.53	5.45	1.93	14.91
High	94th Ave	Cherry St	Burr St	6.77	6.85	1.28	14.89
High	15th St	21st Ave	26th Ave	5.34	7.73	1.74	14.81
High	Fruitvale Ave	Alameda Ave	E 16th St	5.73	7.28	1.77	14.78
Medium	7th St	Washington St	7th St Bridge	6.06	6.64	1.81	14.51
Medium	Grand Ave	Valley St	El Embarcadero	7.95	4.68	1.85	14.48
Medium	Bancroft Ave	84th Ave	98th Ave	6.37	6.81	1.25	14.42
Medium	12th St	Jefferson St	Oak St	5.60	6.66	1.94	14.21

Table 6.3 High Injury Corridors (continued)

Tier	Street Name	Start	End	Weighted Safety Score	Weighted Equity Score	Walk Score®	Total
Medium	High St	Lyon St	Kansas St	6.25	6.23	1.53	14.02
Medium	Bancroft Ave	Church St	Havenscourt Blvd	4.67	7.39	1.68	13.74
Medium	Martin Luther King Jr Way	40th St	44th St	5.50	6.09	1.75	13.35
Medium	Hegenberger Rd	Hegenberger Pl	Hegenberger Lp	5.95	5.88	0.96	12.79
Medium	Telegraph Ave	30th St	51st St	6.61	3.90	1.84	12.35
Medium	Telegraph Ave	William St	Broadway	6.45	3.93	1.87	12.26
Medium	Piedmont Ave	Warren Ave	Entrada Ave	3.44	6.53	1.98	11.95
Medium	Shattuck Ave	45th St	55th St	5.34	3.99	1.82	11.16
Medium	Grand Ave	Lake Park Ave	Oakland Ave	6.24	2.39	1.82	10.46
Medium	Telegraph Ave	51st St	SR 24	4.17	3.22	1.76	9.15

Table 6.4 High Injury Intersections

Tier	Street 1	Street 2	Weighted Safety Score	Weighted Equity Score	Walk Score®	Total Score
High	80th Ave	International Blvd	10.00	7.75	1.52	19.27
High	83rd Ave	International Blvd	8.58	7.96	1.52	18.06
High	98th Ave	Cherry St	8.38	7.52	1.34	17.23
High	E 16th St	Fruitvale Ave	7.13	8.09	1.86	17.08
High	High St	San Leandro St	6.50	8.57	1.80	16.87
High	7th St	Harrison St	5.50	9.18	1.96	16.64
High	34th St	San Pablo Ave	7.71	6.65	1.66	16.01
High	90th Ave	International Blvd	7.92	6.61	1.48	16.00
High	29th St	Telegraph Ave	8.75	5.26	1.86	15.87
High	9th St	Madison St	5.50	8.34	1.86	15.70
High	8th St	Market St	6.50	7.31	1.84	15.65

Table 6.4 High Injury Intersections (continued)

Tier	Street 1	Street 2	Weighted Safety Score	Weighted Equity Score	Walk Score®	Total Score
High	E 19th St	Fruitvale Ave	5.50	8.09	1.72	15.31
High	84th Ave	International Blvd	5.86	7.96	1.50	15.31
High	5th Ave	International Blvd	6.71	6.78	1.76	15.25
High	Brush St	W Grand Ave	7.50	5.89	1.82	15.21
High	35th Ave	International Blvd	4.68	8.57	1.92	15.17
High	52nd Ave	International Blvd	8.38	5.15	1.58	15.11
High	73rd Ave	Bancroft Ave	6.71	6.66	1.64	15.01
High	34th St	Martin Luther King Jr Way	6.58	6.65	1.72	14.95
High	14th St	Market St	5.71	7.31	1.82	14.84
High	27th St	Broadway	6.50	6.39	1.88	14.77
Medium	33rd Ave	Foothill Blvd	6.71	6.15	1.72	14.58
Medium	98th Ave	International Blvd	5.50	7.44	1.54	14.48
Medium	73rd Ave	Garfield Ave	6.13	6.65	1.62	14.39
Medium	12th St	Brush St	5.13	7.31	1.82	14.26
Medium	76th Ave	Macarthur Blvd	6.50	6.29	1.42	14.21
Medium	San Pablo Ave	W Grand Ave	6.50	5.89	1.82	14.21
Medium	E 27th St	Fruitvale Ave	5.04	7.47	1.64	14.14
Medium	24th St	Broadway	5.75	6.39	1.92	14.06
Medium	Macarthur Blvd	Martin Luther King Jr Way	6.50	5.69	1.72	13.91
Medium	21st Ave	International Blvd	6.58	5.42	1.72	13.72
Medium	37th St	Telegraph Ave	6.50	4.05	1.84	12.39
Medium	Grand Ave	Harrison St	5.71	4.53	1.92	12.16
Medium	Coolidge Ave	School St	4.50	5.42	1.44	11.36
Medium	51st St	Telegraph Ave	6.92	2.42	1.76	11.10
Medium	48th St	Telegraph Ave	6.50	2.42	1.88	10.80
Medium	Grand Ave	Staten Ave	5.50	2.73	1.78	10.01

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Fruitvale Unity NCPC
San Antonio NCPC
Northgate NCPC

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Nearly 600 Oakland residents and merchants responded to a 20-question survey developed to better understand the experiences of people walking in Oakland (see Appendix F). The survey was available in English, Spanish, Chinese, and Vietnamese.

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Kerby Olsen

City of Oakland
Department of Transportation

Appendix A

Oakland Walks! 2017 Pedestrian Plan Update

City of Oakland | Department of Transportation

Oakland Public Library

Appendix A

Policies and Plans Adopted by the City of Oakland

Appendix A1: Complete Streets Policy

OAKLAND CITY COUNCIL

Resolution Number 84204 C.M.S.

RESOLUTION ADOPTING A COMPLETE STREETS POLICY TO FURTHER ENSURE THAT OAKLAND STREETS PROVIDE SAFE AND CONVENIENT TRAVEL OPTIONS FOR ALL USERS

WHEREAS, the term "Complete Streets" describes a comprehensive, integrated transportation network, with roadways designed and operated to enable safe, attractive, and comfortable access and travel for all users, including: pedestrians, bicyclists, persons with disabilities, seniors, children, motorists, movers of commercial goods, operators of public transportation, public transportation users of all abilities, and emergency responders; and

WHEREAS, the City of Oakland recognizes that the planning and coordinated development of Complete Streets infrastructure provides benefits for local governments in the areas of infrastructure cost savings; public health; and environmental sustainability; and

WHEREAS, the City of Oakland, through its "Transit First Policy" (Resolution No. 73036 C.M.S.), acknowledges the benefits and value for the public health and welfare of reducing vehicle miles traveled and improving opportunities transportation by walking, bicycling, and public transportation; and

WHEREAS, the City of Oakland currently supports and pursues Complete Streets through the Bicycle Master Plan, Pedestrian Master Plan, General Plan Land Use and Transportation Element, CEQA Thresholds of Significance, and other plans and policies; and

WHEREAS, adoption of a "formal" Complete Streets Policy will allow the City of Oakland to better coordinate existing multimodal transportation planning, design, and operation activities under a single ''Complete Streets" framework; and

WHEREAS, balanced transportation systems that offer an array of safe and convenient choices to travelers makes communities more livable; and

WHEREAS, the State of California has emphasized the importance of Complete Streets by enacting the California Complete Streets Act of 2008 (also known as AB 1358), which requires that when cities or counties revise general plans, they identify how they will provide for the mobility needs of all users of the roadways, as well as through Deputy Directive 64, in which the California Department of Transportation explained that it "views all transportation improvements as opportunities to improve safety, access, and mobility for all travelers in California and recognizes bicycle, pedestrian, and transit modes as integral elements of the transportation system"; and

WHEREAS, the California Global Warming Solutions Act of 2006 (known as AB 32) sets a mandate for the reduction of greenhouse gas emissions in California, and the Sustainable Communities and Climate Protection Act of 2008 (known as SB 375) requires emissions reductions through coordinated regional planning that integrates transportation, housing, and land-use policy, and achieving the goals of these laws will require significant increases in travel by public transit, bicycling, and walking; and

WHEREAS, numerous California counties, cities, and agencies have adopted Complete Streets policies and legislation in order to further the health, safety, welfare, economic vitality, and environmental wellbeing of their communities; and

WHEREAS, the Metropolitan Transportation Commission, through its One Bay Area Grant (OBAG) program, described in Resolution 4035, requires that all jurisdictions, to be eligible for OBAG funds, need to address complete streets policies at the local level through the adoption of a complete streets policy resolution or through a general plan that complies with the California Complete Streets Act of 2008; and

WHEREAS, the Alameda County Transportation Commission, through its Master Program Funding Agreements with local jurisdictions, requires that all jurisdictions must have an adopted complete streets policy, which should include the "Elements of an Ideal Complete Streets Policy" developed by the National Complete Streets Coalition, in order to receive Measure B pass-through and Vehicle Registration Fund funding; and

WHEREAS, the City of Oakland therefore, in light of the foregoing benefits and considerations, wishes to improve its commitment to Complete Streets and desires that its streets form a comprehensive and integrated transportation network promoting safe and convenient travel for all users while preserving flexibility, recognizing community context, and using design guidelines and standards that support best practices; now, therefore be it

RESOLVED, that the City of Oakland adopts the Complete Streets Policy contained in Exhibit A, attached hereto and incorporated herein by reference; and be it

FURTHER RESOLVED, that staff will undertake a review of the City of Oakland General Plan circulation element with respect to the incorporation Complete Streets policies and principles consistent with the California Complete Streets Act of 2008 (AB 1358) and with the Complete Streets Policy adopted by this resolution, and that the General Plan will be amended, if necessary, to reflect the findings of this review; and be it

FURTHER RESOLVED, the proposal relies on the previously certified Final Environmental Impact Reports (EIRs) for the Land Use and Transportation Element of the General Plan (1998), and the Bicycle Master Plan (2007) and the Mitigated Negative Declaration for the Pedestrian Master Plan (2002). Thus, no further environmental review is required. As a separate and independent basis, the proposal is also exempt from CEQA pursuant to CEQA Guidelines Section 15183 "Projects Consistent with a Community Plan, General Plan or Zoning" and/or 15061(b)(3)(General Rule-no possibility of significant environmental impact). The Environmental Review Officer is directed to file a Notice of Determination/Exemption with the County Clerk.

IN COUNCIL, OAKLAND, CALIFORNIA: FEB 5, 2013

PASSED BY THE FOLLOWING VOTE:
AYES - BROOKS, GALLO, KALB, KAPLAN, KERNIGHAN, SCHAAF, McELHANEY, and REID - 8
Noes - 0
Absent - 0
Abstention - 0

Exhibit A
Complete Streets Policy of the City of Oakland

This Complete Streets Policy was adopted by Resolution Number 84204 C.M.S. by the City Council of the Oakland on January 3, 2013.

The City of Oakland recognizes the necessity of providing safe and convenient pedestrian, bicycle and public transportation travel options in order to protect all road users, reduce negative environmental impacts, promote healthy living, and advance the well-being of Oakland citizens. As such, the City of Oakland will plan, design, construct, operate, and maintain appropriate facilities for pedestrians, bicyclists, transit users of all abilities, children, the elderly, and people with disabilities as a routine component of new construction, reconstruction, retrofit, and maintenance projects subject to the exceptions contained herein.

A. Complete Streets Principles

1. Complete Streets Serving All Users and Modes. The City of Oakland expresses its commitment to creating and maintaining Complete Streets that provide safe, comfortable, and convenient travel along and across streets (including streets, roads, highways, bridges, and other portions of the transportation system) through a comprehensive, integrated transportation network that serves all categories of users, including pedestrians, bicyclists, persons with disabilities, motorists, movers of commercial goods, users and operators of public transportation, emergency responders, seniors, children, youth, and families.

2. Context Sensitivity. In planning and implementing street projects, all departments and agencies of the City of Oakland will maintain sensitivity to local conditions in both residential and business districts as well as urban, suburban, and rural areas, and will work with residents, merchants, and other stakeholders to ensure that a strong sense of place ensues. Improvements that will be considered include sidewalks, shared use paths, traffic control signals, exclusive bicycle paths, bicycle lanes, bicycle routes, paved shoulders, street trees and landscaping, planting strips, accessible curb ramps, crosswalks, refuge islands, pedestrian signals, signs, street furniture, bicycle parking facilities, public transportation stops and facilities, transit signal prioritization, and other features assisting in the provision of safe travel for all users, particularly those features identified in the City of Oakland Bicycle Master Plan and Pedestrian Master Plan.

3. Complete Streets Routinely Addressed by All Departments. All relevant departments and agencies of the City of Oakland will work towards making Complete Streets practices a routine part of everyday operations, approach every relevant project, program, and practice as an opportunity to improve streets and the transportation network for all categories of users, and work in coordination with other departments, agencies, and jurisdictions to maximize opportunities for Complete Streets, connectivity, and cooperation.

4. All Projects and Phases. Complete Streets infrastructure sufficient to enable reasonably safe travel along and across the right of way for each category of users will be incorporated into all planning, funding, design, approval, and implementation processes for any construction, reconstruction, retrofit, maintenance, operations, alteration, or repair of streets (including streets, roads, highways, bridges, and other portions of the transportation system), except that specific infrastructure for a given category of users may be excluded if an exception is approved via the process set forth in section C.I of this policy.

B. Implementation

5. Design. The City of Oakland will generally follow its own accepted or adopted design standards as prescribed in the Oakland Municipal Code (OMC). In particular, the Director of Public Works or his/her designee is responsible for developing and publishing Complete

Street standards for the design and construction of the Street System with a goal of balancing user needs, and for updating the standards from time to time to reflect emerging best practices and innovative design options as appropriate for City of Oakland context. Such standards shall apply to all streets regardless of whether they are private streets or public streets.

6. Network/Connectivity. The City of Oakland will incorporate Complete Streets infrastructure into existing streets to improve the safety and convenience of all users, with the particular goal of creating a connected network of facilities accommodating each category of users, and increasing connectivity across jurisdictional boundaries and for anticipated future transportation investments.

7. Implementation Next Steps. The City of Oakland will take the following specific next steps to implement this Complete Streets Policy:

   A) Plan Consultation and Consistency: Maintenance, planning, and design of projects affecting the transportation system will be consistent with local bicycle, pedestrian, transit, multimodal, and other relevant plans, to the extent these local plans reflect complete street principles.

   B) Stakeholder Consultation: Develop and/or clearly define a process to allow for stakeholder involvement on projects and plans including, to the extent possible relying upon and refining existing advisory groups and stakeholder engagement channels. In particular, the Bicycle and Pedestrian Advisory Committee (BPAC) and Mayor's Commission on Persons with Disabilities will play important roles to support implementation of this Complete Streets policy within the City of Oakland.

   C) Complete Streets Design Standards and Guidelines: Develop and maintain a comprehensive set of Street Design Standards and Guidelines to promote complete streets principles in all types and phases of projects within the City of Oakland. The Design Guidelines will be developed by the Director of Public Works or his/her designee in accordance with the Public Works Agency authority over street standards.

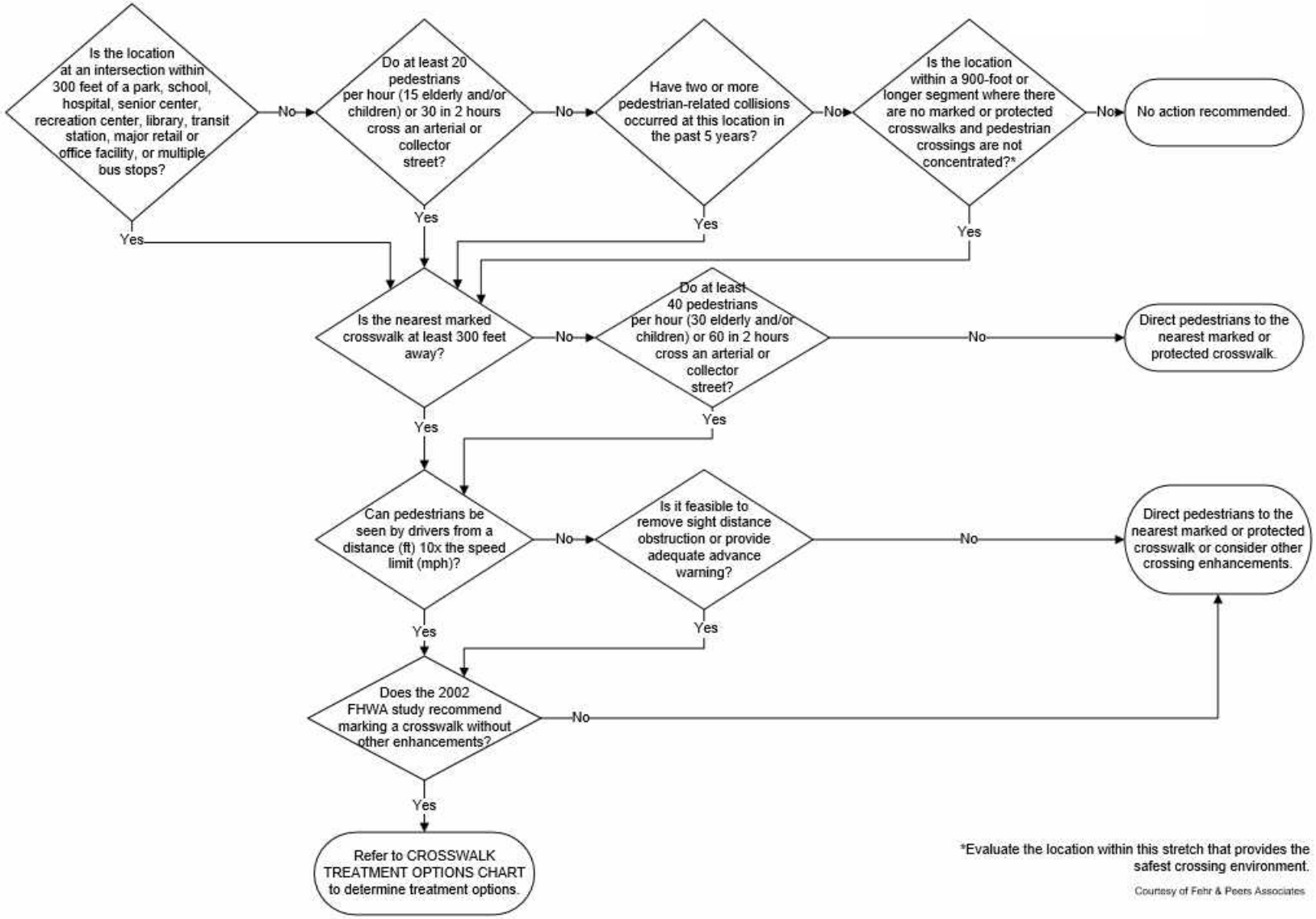
8. Performance Measures. The Director of Public Works or his/her designee will compile the performance evaluations of well the streets and transportation network of Oakland are serving each category of user by (1) establishing specific performance measures pertaining to Complete Streets; (2) collecting and updating data to evaluate measures on a regular basis; and (3) making the results of Complete Streets performance analyses available publicly as completed. All relevant agencies or departments will contribute available data and other information to these performance evaluations by collecting baseline data and collecting follow-up data on a regular basis to ensure that the City of Oakland serves each category of roadway user.

C. Exceptions

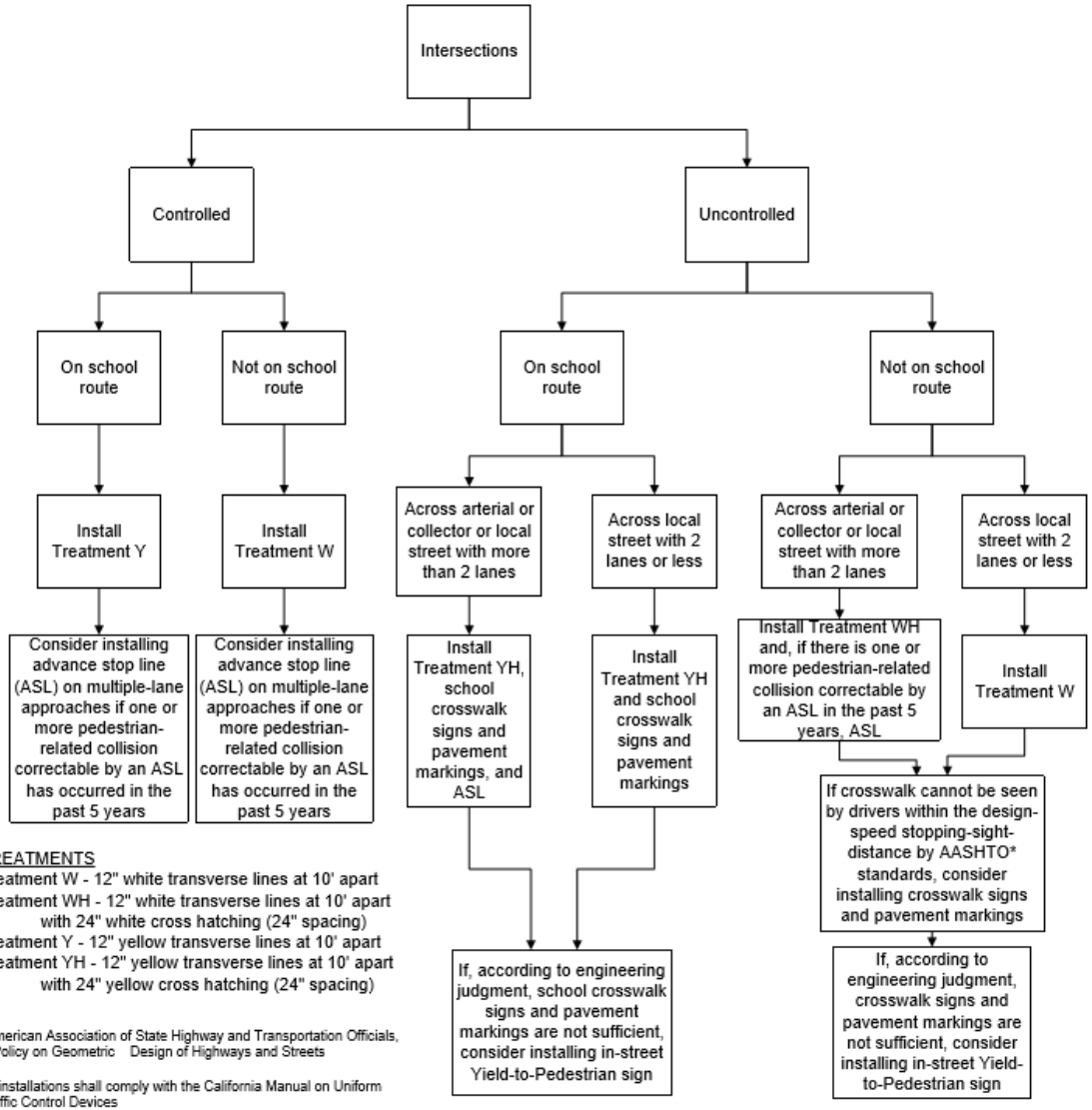
9. Exception Approvals. Exceptions to the Complete Street standards will require written findings explaining accommodations for all users and modes were not included in the plan or project. The exception must be approved by the Public Works Director or his/her designee, and will be made publicly available. Exceptions must explain why accommodations for all users and modes were not included in the plan or project.

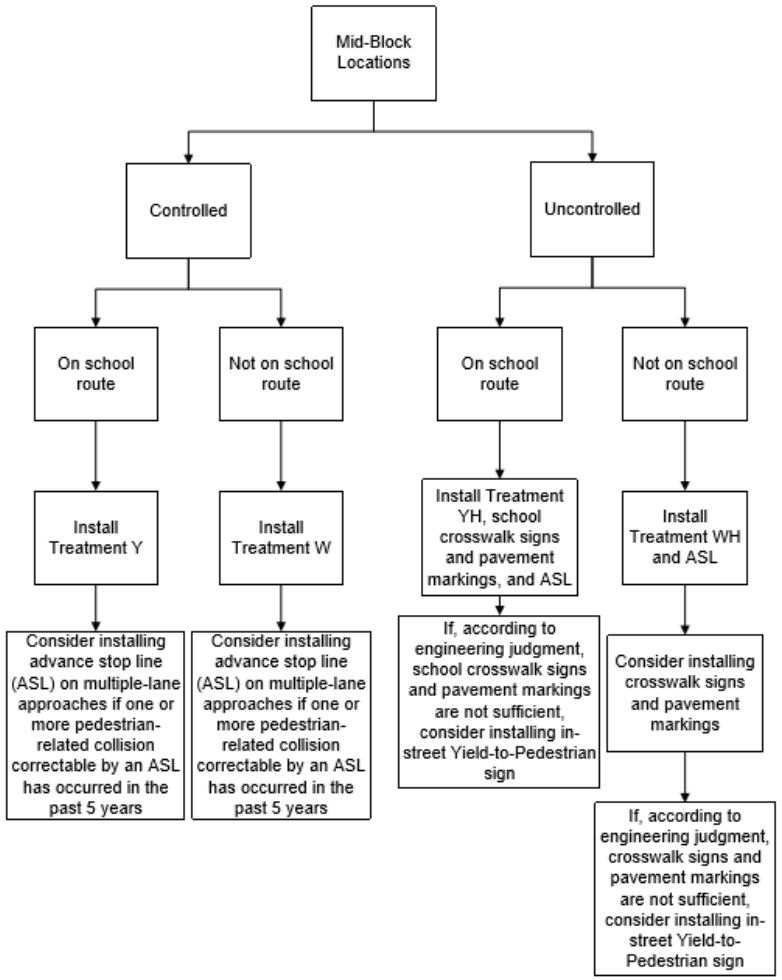
Appendix A2: City of Oakland Crosswalk Policy

Crosswalk Decision Location Matrix



Crosswalk Treatments Option Chart





Appendix A3: Other Plans Adopted by the City of Oakland

Specific Planning Documents that the City of Oakland has Adopted.

AC Transit Major Corridors Study (2016)

Nine of AC Transit's 11 major transit corridors are located in Oakland. Through the agency's Major Corridors Study (2016), AC Transit evaluated potential transit improvements on these major corridors. Three bus transit investment strategies were considered, including enhanced bus operations, rapid bus operations, and bus rapid transit. Further planning and coordination with the City is needed to move these improvement concepts into environmental, design, and implementation.

Coliseum Area Specific Plan (2015)

The Coliseum Area Specific Plan seeks to transform the underutilized land around the Oakland Coliseum and Arena, located in the East Oakland/ Elmhurst area, into a sports, entertainment, and transit-oriented residential district. The plan's goals are to create active streets and public spaces that provide an enhanced pedestrian experience. New connections will be made between the proposed housing, Coliseum BART station, the sports facilities and the San Leandro Bay waterfront.

Lake Merritt Station Area Plan (2014)

The Lake Merritt Station Area Plan provides policies, based on Oakland's General Plan, that guide development within a half-mile radius of the Lake Merritt BART station, located on the southeastern edge of the Chinatown/ Central Oakland district. The plan proposes projects to improve the pedestrian environment by narrowing or reducing traffic lanes, extending curbs, adding pedestrian countdown signals and pedestrian-scaled lighting, restoring streets to two-way and improving five of the six I-880 undercrossings.

Broadway/Valdez District Specific Plan (2014)

The Broadway/Valdez District Specific Plan establishes goals and policies to implement a long-term vision for the Uptown district. The plan aims to transform Broadway between Grand Avenue and I-580 from an auto-dominated arterial to a pedestrian-friendly retail destination by adding more mixed land uses and projects to improve the walking environment through traffic calming, street trees and other streetscape improvements.

West Oakland Specific Plan (2014)

The objectives of the West Oakland Specific Plan are to bring to life the community's longstanding vision for a West Oakland that contains viable employment opportunities, provides needed goods and services, supports abundant and affordable housing resources, and facilitates sustainable development. The plan identifies particular locations for streetscape improvements, shade trees, narrower traffic lanes, on-street parking, continuous sidewalks, lighting and connections across and under freeways and wayfinding plans (such as West Oakland Walks) to make walking in West Oakland safer and more secure from crime.

Central Estuary Area Plan (2013)

The Central Estuary Area Plan covers the area between I-880 and the Estuary, and between 19th and 54th Avenues, which straddles the San Antonio and Fruitvale districts. The plan emphasizes the need for pedestrian improvements to connect adjacent Oakland neighborhoods with the waterfront, Bay Trail and the Fruitvale BART station. It also identifies roadways with particularly poor pedestrian facilities, including Fruitvale Avenue, High Street, International Boulevard and all crossings under I-880.

Plan Bay Area (2013)

Plan Bay Area is an integrated transportation and land-use/housing strategy for the nine-county region through 2040. The plan calls for 80% of the region's future housing to be in Priority Development Areas (PDAs). PDAs are neighborhoods within walking distance of frequent transit service, offering a wide variety of housing options, and featuring services such as grocery stores, restaurants and recreational centers. The Oakland PDAs are centered on: MacArthur Transit Village, West Oakland, Downtown and Jack London Square, Oakland Transit Oriented Development Corridors, Fruitvale and Dimond Areas, Eastmont Town Center, and Coliseum BART Station Area.

Alameda Countywide Transportation Plan and Countywide Pedestrian Plan (2012)

The Alameda Countywide Transportation and Countywide Pedestrian Plans, developed by the Alameda County Transportation Commission (Alameda CTC), prioritize pedestrian projects that serve destinations of countywide significance, such as transit stations, central business districts and other activity centers, inter-jurisdictional trails and communities of concern.

East Bay Greenway (2008)

The East Bay Greenway is a 12-mile bicycle and pedestrian pathway planned to link BART stations and neighborhoods in Oakland, San Leandro, Hayward and unincorporated Alameda County. The original plan was developed by Oakland nonprofit organization Urban Ecology. Implementation and subsequent studies are ongoing (see Concurrent Efforts section, below).

Oakland Pedestrian Master Plan (2002)

The 2002 Pedestrian Master Plan built on several foundational policies in the Land Use and Transportation Element (LUTE) by suggesting targeted policy actions to improve the pedestrian environment throughout Oakland. The Plan emphasized increased pedestrian safety and access through improved street design guidelines, pedestrian gap analysis and a review of the City's traffic signal timing guidelines.

Envision Oakland: City of Oakland General Plan (1998)

The Land Use and Transportation Element (LUTE) of Oakland's General Plan establishes long-term city-wide planning goals and provides strategies to accomplish them. Relevant goals/objectives include increasing pedestrian safety through traffic-calming, improving streetscapes and increasing pedestrian access to destinations such as the waterfront and the Oakland Coliseum.

The Open Space, Conservation, and Recreation (1996)

The Open Space, Conservation and Recreation (OSCAR) Element of the General Plan is the City's official policy document that governs the use of open land, natural resources, and parks. The Element is part of Oakland's State-mandated General Plan, that serves as a "blueprint for change" in Oakland with regard to these topics. The OSCAR Element contains goals, objectives, policies and actions across a diverse range of topics. The premise that binds these topics together is that Oakland can be a more attractive city and a better place to live by conserving and rediscovering its natural resources, growing in harmony with the environment, and meeting recreational needs in new and creative ways.

Bay Trail Plan (1989)

The Bay Trail Plan lays out the alignment and general policies that guide development of the San Francisco Bay Trail, a planned 500-mile continuous bicycle and pedestrian pathway around the San Francisco and San Pablo Bays and "spur" trails that connect the trail to nearby destinations. In Oakland, the Bay Trail avoids the Port of Oakland on Mandela Parkway and Third/Second Streets and becomes a pathway along the Jack London Square shoreline and along the Embarcadero.

BART Station Area Plans

Of the City of Oakland's eight BART stations (West Oakland, 12th Street, 19th Street, Lake Merritt, MacArthur, Rockridge, Fruitvale and Coliseum), the agency has written access plans for three: West Oakland, 19th Street and Fruitvale. In addition, the City of Oakland developed a plan for the Lake Merritt station area, summarized above. These plans recommend improvements to encourage more passengers to walk to the stations, and make it safer and more secure to do so. Examples include additional lighting, signage and pedestrian-activated traffic signals.

Concurrent Efforts

During the development of this Pedestrian Plan, the City of Oakland was also working on the following related efforts:

Complete Streets Design Guidelines

The Complete Streets Guidelines will identify pedestrian priority areas through place types and overlays, as well as provide guidance regarding the pedestrian realm, such as sidewalk area widths and intersection design. The guidelines will address sidewalk width, traffic signal design and timing, and other traffic calming measures, including their relationship to fire-fighting equipment.

East Bay Greenway

The East Bay Greenway is a 12-mile bicycle and pedestrian pathway planned to link BART stations and neighborhoods in Oakland, San Leandro, Hayward and unincorporated Alameda County. The segment between the Coliseum BART station and 85th Avenue was completed in 2015. Remaining Greenway segments in Oakland will serve the Lake Merritt, Coliseum (to the north) and Fruitvale BART stations and the neighborhoods in between. In 2015-17, the Alameda County Transportation Commission will be developing a Plan, Project Approval/ Environmental Document and 35% design for the project.

Downtown Specific Plan

The City's Specific Plan for Downtown Oakland is intended to guide development by coordinating land use and transportation planning in a way that promotes pedestrian activity and economic growth throughout Downtown. A major goal of the Plan is to give the highest priority to pedestrians, bicyclists and transit-riders. To achieve this, the Plan will explore ways to redesign Downtown streets by narrowing lane widths and numbers of lanes, adding on-street parking, restoring streets to two-way, lowering vehicle speeds, improving highway underpasses and adding bicycle lanes. Streetscape design improvements will also be a high priority to improve the comfort level of pedestrians.

Americans with Disabilities Act (ADA) Transition Plan

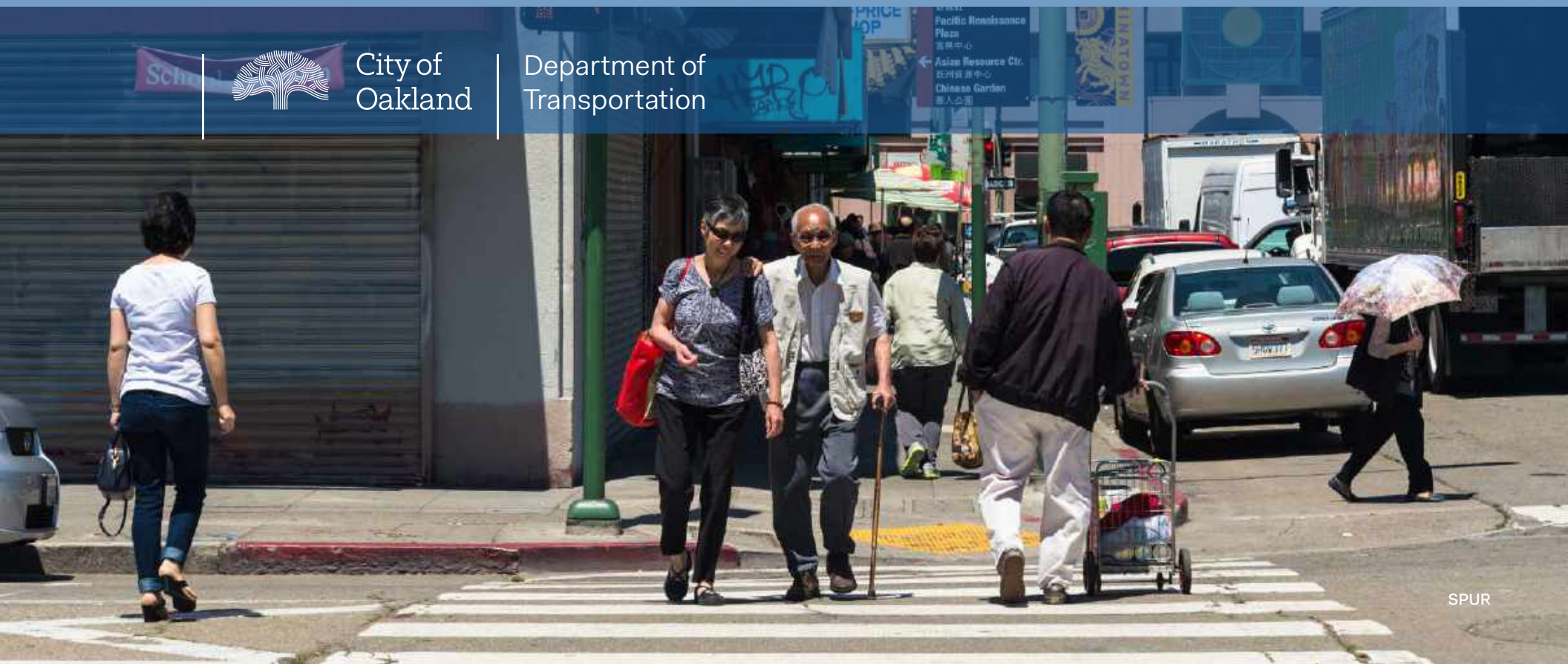
The ADA Transition Plan update will set a course for making streets throughout Oakland accessible to people who use wheelchairs or other mobility devices. The plan will include an updated curb ramp inventory and a timeline for making all required curb ramp improvements.

City of Oakland
Department of Transportation

Appendix B

Oakland Walks! 2017 Pedestrian Plan Update

City of Oakland | Department of Transportation



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Appendix B
Safety Strategy: Improvements/Countermeasures

Safety Strategy: Improvements and Countermeasures

The high injury corridors and intersections, known as the High Injury Network, were identified using a safety analysis as described in Chapter 6 (Prioritizing Pedestrian Improvements).

The safety strategy identified improvements or countermeasures to increase pedestrian safety at a select number of high injury intersections and high injury corridors. Many of the high injury corridors and intersections were not studied here because they have already received funding for pedestrian improvements - most notably the Bus Rapid Transit project on International Boulevard - while others are part of ongoing planning efforts, such as the Downtown Specific Plan, that will require further coordination or study. City staff will continue to monitor and coordinate pedestrian safety improvements for intersections and corridors that were not included in this safety strategy while those on the list below are implemented. The tables below are divided into three categories:

- Projects included in the safety strategy (B1-B2)
- Projects with associated funding (B3-B4)
- Projects with no associated funding and need for additional analysis and design (B5-B6)

The safety strategy countermeasures that are included in Table B-1 and Table B-2 have associated sheets that describe the locations in more detail. Note that these countermeasures are suggestions for City staff and will be considered according to current and future City policy and practices as well as future projects.

Table B1: Corridors Studied in the Safety Strategy

Street Name	Start	End	Short Term Countermeasures	Long Term Countermeasures	Other Improvements
14TH ST	MYRTLE ST	OAK ST	• At signalized intersections, set pedestrian countdown timers within the CA MUTCD recommended time of 3.5 feet per second • At the 14th Street and Market Street intersection, which is adjacent to the West Oakland Middle School, re-stripe marked crosswalks with high visibility markings • At the 14th Street and Jackson Street and 14th Street and Madison Street intersections, which are adjacent to Little Star Preschool, restripe marked crosswalks with high visibility markings • At the 14th Street and Broadway intersection, shorten signal cycle length • At each intersection, restrict on-street parking within 20-feet of the intersection and marked crosswalks • Implement near-term road diet with signing and pavement markings only to reduce 14th Street from a four-lane street to a two-lane street	• Convert near-term road diet to permanent installation with hardscape sidewalk improvements • At the 14th Street and Market Street, 14th Street and West Street, and 14th Street and Brush Street intersections, extend medians to provide pedestrian refuge islands at marked crosswalks	Awarded Active Transportation Program (ATP) grant in 2016, between Brush Street and Oak Street, resulting in a reduction of travel lanes from four to two lanes, addition of Class IV protected bicycles lanes, improved pedestrian facilities including refuge, market crossings, retimed signals, storm drain gardens, and transit boarding islands

Table B1: Corridors Studied in the Safety Strategy (cont.)

Street Name	Start	End	Short Term Countermeasures	Long Term Countermeasures	Other Improvements
8TH ST	FRANKLIN ST	HARRISON ST	• At the 8th Street and Fallon Street intersection, add a high visibility crosswalk on the north leg and re-stripe marked crosswalk with high visibility markings • At the 8th Street and Fallon Street intersection, install advanced yield signage at each crossing • At signalized intersections, set pedestrian countdown timers within the CA MUTCD recommended time of 3.5 feet per second • At signalized intersections, implement Leading Pedestrian Interval (LPI) • At the 8th Street and Harrison Street and 8th Street and Franklin Street intersections, convert permissive phase to protected phase • At each intersection, restrict on-street parking within 20-feet of the intersection and marked crosswalks • Implement pedestrian safety zones extending from the curb at the 8th Street and Harrison Street and 8th Street and Fallon Street intersections	• At the 8th Street and Harrison Street and 8th Street and Fallon Street intersections, install curb extensions on each corner • Implement road diet to manage vehicle speeds and shorten crossing distance	Highway Safety Improvement Program 2016-Upgraded traffic signals on 8th Street and Madison Street, 8th Street and Oak Street. New bikeway striping, repaved, and new ADA curb ramps along the corridor. Identified in Lake Merritt Station Area Plan as a community priority for two way conversion, or sidewalk extensions. Downtown Plan calls for 2-waying the street with a potential parking protected Class IV bike lane
8TH ST	OAK ST	FALLON ST	• At the 8th Street and Fallon Street intersection, add a high visibility crosswalk on the north leg and re-stripe marked crosswalk with high visibility markings • At the 8th Street and Fallon Street intersection, install advanced yield signage at each crossing • At signalized intersections, set pedestrian countdown timers within the CA MUTCD recommended time of 3.5 feet per second • At signalized intersections, implement Leading Pedestrian Interval (LPI) • At the 8th Street and Harrison Street and 8th Street and Franklin Street intersections, convert permissive phase to protected phase • At each intersection, restrict on-street parking within 20-feet of the intersection and marked crosswalks ($600 per approach) • Implement pedestrian safety zones extending from the curb at the 8th Street and Harrison Street and 8th Street and Fallon Street intersections	• At the 8th Street and Harrison Street and 8th Street and Fallon Street intersections, install curb extensions on each corner • Implement road diet to manage vehicle speeds and shorten crossing distance	Highway Safety Improvement Program 2016-Upgraded traffic signals on 8th Street and Madison Street, 8th Street and Oak Street. New bikeway striping, repaved, and new ADA curb ramps along the corridor. Identified in LMSA Plan as a community priority for two way conversion, or sidewalk extensions. Downtown Plan calls for 2-waying the street with a potential parking protected Class IV bike lane

Table B1: Corridors Studied in the Safety Strategy (cont.)

Street Name	Start	End	Short Term Countermeasures	Long Term Countermeasures	Other Improvements
94TH AVE	CHERRY ST	BURR ST	• At the 94th Avenue and MacArthur Boulevard and 94th Avenue and Thermal Street intersections, install advanced yield signage at marked crosswalks • At the 94th Avenue and Peach Street intersection, add crosswalks across 94th Avenue with in-street "Pedestrian Crossing" signage and advanced yield signage • At the 94th Avenue and MacArthur Boulevard intersection, implement crosswalks and crossing treatments to provide access to transit stops • At the 94th Avenue and Thermal Street intersection, re-stripe marked crosswalks with high visibility markings • At each intersection, restrict on-street parking within 20-feet of the intersection and marked crosswalks • Implement pedestrian safety zones extending from the curb at the 94th Avenue and MacArthur Boulevard intersection	• Extend median to provide refuge island on the north side of the 94th Street and MacArthur Boulevard intersection • Provide raised median/refuge island at the marked crosswalk on the south side of the 94th Avenue and MacArthur Boulevard intersection • Install raised crosswalks at marked crosswalk locations to help improve visibility of marked crosswalks and slow vehicle speeds • At the 94th Avenue and MacArthur Boulevard intersection, install curb extensions on each corner	Proposed Bike Route, and intersection improvements for 94thAvenue and MacArthur Boulevard

Table B1: Corridors Studied in the Safety Strategy (cont.)

Street Name	Start	End	Short Term Countermeasures	Long Term Countermeasures	Other Improvements
9TH ST	FRANKLIN ST	FALLON ST	• At the 9th Street and Alice Street and 9th Street and Fallon Street intersections, install advanced yield signage at marked crosswalks • At the 9th Street and Fallon Street intersection, which is adjacent to Laney College, add a high visibility crosswalk across the north leg of Fallon Street • At the 9th Street and Fallon Street intersection, re-stripe the marked crosswalk on the south leg with high visibility markings • At signalized intersections, set pedestrian countdown timers within the CA MUTCD recommended time of 3.5 feet per second • At the 9th Street and Franklin Street, 9th Street and Webster Street, and 9th Street and Harrison Street intersections, shorten signal cycle length • At each intersection, restrict on-street parking within 20-feet of the intersection and marked crosswalks • Implement near-term road diet with signing and pavement markings only; consider moving on-street parking away from curb to create separated bike facility	•At the 9th Street and Alice Street and 9th Street and Fallon Street intersections, install rectangular rapid flashing beacons (RRFBs) on each crossing • Convert near-term road diet to more permanent installation by providing hardscape sidewalk improvements	New bike lane added between Harrison Street and Fallon Street and stop control added at 9th Street and Alice Street. Downtown is funded for 13 intersections, including signal mast arms, vehicle/ bicycle detection, accessible pedestrian signal upgrade, and other improvements. Identified in Downtown Plan to be a two-way with back in parking
BANCROFT AVE	84TH AVE	98TH AVE	• At the Bancroft Avenue and 86th Avenue, Bancroft Avenue and 87th Avenue, Bancroft Avenue and 88th Avenue, and Bancroft Avenue and 89th Avenue intersections, install in-street “Pedestrian Crossing” signage at marked crosswalks • At the Bancroft Avenue and 86th Avenue, Bancroft Avenue and 87th Avenue, Bancroft Avenue and 88th Avenue, and Bancroft Avenue and 89th Avenue intersections, install advanced yield signage at marked crosswalks • At signalized intersections, implement Leading Pedestrian Interval (LPIs) • At the Bancroft Avenue and 85th Avenue, Bancroft Avenue and 87th Avenue, Bancroft Avenue and 90th Avenue, Bancroft Avenue and 94th Avenue, Bancroft Avenue and 96th Avenue intersections, implement crosswalks and crossing treatments to provide access to transit stops • At the Bancroft Avenue and 98th Avenue intersection, which is adjacent to the E Morris Cox Elementary School, re-stripe marked crosswalks with high visibility markings	• At the Bancroft Avenue and 84th Avenue, Bancroft Avenue and 85th Avenue, Bancroft Avenue and 86th Avenue, Bancroft Avenue and 88th Avenue, Bancroft Avenue and 94th Avenue, and Bancroft Avenue and 96th Avenue intersections, install crosswalks with RRFBs	Highway Safety Improvement Program 2016-Install High Intensity Activated Crosswalks (HAWKs) and RRFBs at eleven locations along the corridor; install signal mast arms at three locations; and install a landscape at the northeast corner of Bancroft Avenue and 67th Street. Corridor improvements from Havenscourt Boulevard to 98th Avenue

Table B1: Corridors Studied in the Safety Strategy (cont.)

Street Name	Start	End	Short Term Countermeasures	Long Term Countermeasures	Other Improvements
BANCROFT AVE	CHURCH ST	80TH AVE	• At the Bancroft Avenue and 78th Avenue and Bancroft Avenue and Ritchie Street intersections, install advanced yield signage at marked crosswalks • At signalized intersections, implement Leading Pedestrian Interval (LPI) • At the Bancroft Avenue and Ritchie Street intersection, implement a crosswalk on the south leg and crossing treatments to provide access to transit stops • At the Bancroft Avenue and 73rd Avenue intersection which is adjacent to Markham Elementary School, re-stripe marked crosswalks with high visibility markings • At the Bancroft Avenue and Ritchie Street and Bancroft Avenue and 78th Avenue intersections, re-stripe high visibility crosswalks • Prohibit right-turn on red at signalized intersections when pedestrian pushbuttons have been pushed	• At uncontrolled marked crosswalks, install RRFBs	Highway Safety Improvement Program 2016-Install HAWKs and RRFBs at eleven locations along the corridor; install signal mast arms at three locations; and install a landscape at the northeast corner of Bancroft and 67th Street. Corridor improvements from Havenscourt to 98th Ave
BROADWAY	9TH ST	11TH	• Convert each intersection to fixed pedestrian recall • At each intersection, set pedestrian countdown timers within the CA MUTCD recommended time of 3.5 feet per second • At each intersection, shorten signal cycle length • At each intersection, implement Leading Pedestrian Interval (LPI) • Implement pedestrian safety zones extending from the curb at each intersection	• At signalized intersections adjust signal timing to separate turning movements from pedestrian crossing phase • Extend median to provide refuge island on the south side of the Broadway and 11th Street intersection • Implement road diet on low volume cross streets1 to shorten pedestrian crossing distances	Pedestrian Improvements funded through the Bus Rapid Transit (BRT). Includes new ADA curb ramps as well as pedestrian access to new stations. Included in downtown Oakland specific plan (Broadway from Embarcadero to 27th Street)
BROADWAY	16TH ST	19TH ST	• Convert each intersection to fixed pedestrian recall • At each intersection, set pedestrian countdown timers within the CA MUTCD recommended time of 3.5 feet per second • At each intersection, shorten signal cycle length • At each intersection, implement Leading Pedestrian Interval (LPI) • Implement pedestrian safety zones extending from the curb at each intersection	• At signalized intersections adjust signal timing to separate turning movements from pedestrian crossing phase • Extend median to provide refuge island on the south side of the Broadway and 11th Street intersection • Implement road diet on low volume cross streets1 to shorten pedestrian crossing distances	Pedestrian Improvements funded through the BRT. Includes new ADA curb ramps as well as pedestrian access to new stations. Included in downtown Oakland specific plan (Broadway from Embarcadero to 27th Street)

Table B1: Corridors Studied in the Safety Strategy (cont.)

Street Name	Start	End	Short Term Countermeasures	Long Term Countermeasures	Other Improvements
E 15TH ST	21ST AVE	26TH AVE	• At the 15th Street and 26th Avenue intersection, add stop sign on southbound approach • At the 15th Street and 23rd Avenue and 15th Street and Miller Avenue intersections, install advanced yield markings to each minor approach • At the 15th Street and 22nd Avenue intersection, which is adjacent to Garfield Elementary School, add high visibility crosswalks with signage and advanced yield markings • Add edgeline markings for street narrowing and parking definition • At each intersection, restrict on-street parking within 20-feet of intersection and marked crosswalks • Implement pedestrian safety zones extending from the curb at the 15th Street and 22nd Avenue intersection	• Implement crossing improvements such as RRFBs, pedestrian refuge island, or high visibility crosswalk at the High Street and 22nd Avenue intersection • At the 15th Street and 22nd Avenue intersection, install curb extensions on each corner	-
FOOTHILL BLVD	45TH AVE	TRASK ST	• Add crossing sign and include directional arrow indicating crossing • At the Foothill Boulevard and 45th Street intersection, upgrade school crossing sign to current standard and include directional arrow indicating crossing • At signalized intersections, set pedestrian countdown timers within the CA MUTCD recommended time of 3.5 feet per second • At the Foothill Boulevard and 45th Avenue, Foothill Boulevard and 46th Avenue, Foothill Boulevard and 50th Avenue, Foothill Boulevard and 51st Avenue, Foothill Boulevard and Congress Avenue, Foothill Boulevard and Belvedere Street, and Foothill Boulevard and Cole Street intersections, install advanced yield markings and advanced pedestrian crosswalk ahead signs across Foothill Boulevard • At the Foothill Boulevard and Vicksburg intersection, re-stripe marked crosswalk on north leg • At the Foothill Boulevard and 47th Street intersection, convert signal from pedestrian actuated to fixed recall for the pedestrian walk phase	• At the Foothill Boulevard and Trask Street intersection, install curb extensions on the northeast, northwest, and southwest corners • At the Foothill Boulevard and 45th Avenue and Foothill Boulevard and 50th Street intersections, install a rectangular rapid flashing beacon and associated school crossing signs	Former Redevelopment Streetscape

Table B1: Corridors Studied in the Safety Strategy (cont.)

Street Name	Start	End	Short Term Countermeasures	Long Term Countermeasures	Other Improvements
GRAND AVE	LAKE PARK AVE	WILDWOOD AVE	• Convert each signalized intersection to fixed pedestrian recall • At signalized intersections, set pedestrian countdown timers within the CA MUTCD recommended time of 3.5 feet per second • At the 2 mid-block crossings located between Grand Avenue and Sunnyslope Avenue and Grand Avenue and Weldon Avenue, add in street "Pedestrian Crossing signage" • At the Grand Avenue and Park View Terrace, Grand Avenue and Elwood Avenue, Grand Avenue and Mandana Boulevard, and Grand Avenue and Boulevard Way intersections, implement crosswalks and crossing treatments to provide access to transit stops • At signalized intersections, implement Leading Pedestrian Interval (LPI) • Implement near-term road diet with signing and pavement markings only from east of the I-580 intersection to Elwood Avenue	• At the mid-block, marked crossing at Grand Avenue and Sunnyslope Avenue, install a rectangular rapid flashing beacon and associated crossing signs • Remove channelized right turn lanes at the Grand Avenue and Santa Clara and the Grand Avenue and Bay Place intersections • Convert near-term road diet to permanent installation by providing hardscape sidewalk improvements • At signalized intersections, adjust signal timing to separate turning movements from pedestrian crossing phase	Grand Avenue Road Diet
GRAND AVE	VALLEY ST	PARK VIEW TERRACE	• Convert each signalized intersection to fixed pedestrian recall • At signalized intersections, set pedestrian countdown timers within the CA MUTCD recommended time of 3.5 feet per second • At the 2 mid-block crossings located between Grand Avenue and Sunnyslope Avenue and Grand Avenue and Weldon Avenue, add in street "Pedestrian Crossing signage" • At the Grand Avenue and Park View Terrace, Grand Avenue and Elwood Avenue, Grand Avenue and Mandana Boulevard, and Grand Avenue and Boulevard Way intersections, implement crosswalks and crossing treatments to provide access to transit stops • At signalized intersections, implement Leading Pedestrian Interval (LPI) • Implement near-term road diet with signing and pavement markings only from east of the I-580 intersection to Elwood Avenue	• At the mid-block, marked crossing at Grand Avenue and Sunnyslope Avenue, install a rectangular rapid flashing beacon and associated crossing signs • Remove channelized right turn lanes at the Grand Avenue and Santa Clara and the Grand Avenue and Bay Place intersections • Convert near-term road diet to permanent installation by providing hardscape sidewalk improvements • At signalized intersections, adjust signal timing to separate turning movements from pedestrian crossing phase	-

Table B1: Corridors Studied in the Safety Strategy (cont.)

Street Name	Start	End	Short Term Countermeasures	Long Term Countermeasures	Other Improvements
HIGH ST	LYON ST	KANSAS ST	• At the High Street and Fleming Avenue, High Street and Penniman Avenue, High Street and Culver Street, and High Street and Kansas Street intersections, install advanced yield signage at marked crosswalks • At the High Street and Culver Street, High Street and Fleming Avenue, and High Street and Kansas Street intersections, implement crosswalks and crossing treatments to provide access to transit stops • At the High Street and Fleming Avenue, High Street and Penniman Avenue, High Street and Culver Street, and High Street and Kansas Street intersections, re-stripe marked uncontrolled crosswalks with high visibility markings • At each intersection, restrict on-street parking within 20-feet	• At each intersection east of the High Street and Masterson Street intersection, install crosswalks with curb ramps in medians • At the High Street and Porter Street intersection, which is adjacent to the Boys and Girls Club, install raised pedestrian crossings • At the High Street and Masterson Street and High Street and Kansas Street intersections, which are adjacent to the St. Lawrence O'Toole Catholic School, install raised pedestrian crossings	Highway Safety Improvement Program 2016-Construct crossing enhancements, signal placement improvements, and new pedestrian signal countdown heads

Table B1: Corridors Studied in the Safety Strategy (cont.)

Street Name	Start	End	Short Term Countermeasures	Long Term Countermeasures	Other Improvements
MACARTHUR BLVD	77TH AVE	83RD AVE	• At the mid-block crossing south of the MacArthur Boulevard and Ritchie Street intersection, add advanced yield markings • At the MacArthur Boulevard and Parker Avenue intersection, consider implementing a crosswalk on the north leg with crossing treatments to provide access to transit stop • At unsignalized intersections, re-stripe marked crosswalks to high visibility crosswalks • Add high visibility crosswalks with signage and advanced yield markings at the MacArthur Boulevard and 83rd Avenue intersection • At signalized intersections, convert permissive phase to protected phase • At each intersection, restrict on-street parking within 20-feet of intersections and mid-block crossings • Implement near-term road diet with signing and pavement markings only north of MacArthur Boulevard and 83rd Street	• Install continuous median with pedestrian refuge islands • Convert near-term road diet to more permanent installation by providing hardscape sidewalk improvements	Former Redevelopment Streetscape
BRUSH ST	12TH ST	14TH ST	• At the Brush Street and 12th Street intersection, add "Pedestrian Crossing Prohibited" signage at the north side of Brush Street • At the Brush Street and 14th Street intersection, replace pedestrian countdown timer on northwest corner • At signalized intersections, re-stripe marked crosswalks for general maintenance • At the Brush Street and 12th Street intersection, implement Leading Pedestrian Interval (LPI) • At each intersection, restrict on-street parking within 20-feet of intersection and marked crosswalks • Implement pedestrian safety zones extending from the curb at the Brush Street and 12th Street and Brush Street and 14th Street intersections	• Implement road diet along Brush Street; would need to extend beyond the limits of 12th and 14th Streets • At the Brush Street and 12th Street and Brush Street and 14th Street intersections, install curb extensions on each corner • At the Brush Street and 14th Street intersection, adjust signal timing to separate turning movements from pedestrian phase crossing	Combined intersections to make a corridor

Table B1: Corridors Studied in the Safety Strategy (cont.)

Street Name	Start	End	Short Term Countermeasures	Long Term Countermeasures	Other Improvements
73RD AVE	BANCROFT AVE	HILLSIDE ST	• At signalized intersections, set pedestrian countdown timers within the CA MUTCD recommended time of 3.5 feet per second ($8,000 per intersection) • Implement crosswalks and crossing treatments to provide access to transit stops at the 73rd Avenue and Bancroft Avenue, 73rd Avenue and Garfield Avenue and 73rd Avenue and Hillside Street intersections ($2,500 per crosswalk) • At each signalized intersections, implement Leading Pedestrian Interval (LPI) ($2,000 per intersection) • Implement near-term road diet, with signing and pavement markings only to reduce 73rd Avenue from a six-lane street to a four-lane or three-lane street ($30,000 per mile)	• Install high visibility crosswalk across 73rd Avenue and Hillside Street including crossing treatments such as advanced yield markings, advanced warning signs, and rectangular rapid flashing beacon ($34,300 per crossing) • Extend medians at marked crosswalks to provide refuge island ($25,000 per island) • Re-design the right-turn movement at 73rd Avenue and MacArthur Boulevard to remove the lane add so the right-turn movement is not a free movement • Convert near-term road diet to permanent installation with hardscape sidewalk improvements ($150,000 per mile) • At signalized intersections, adjust signal timing to separate turning movements from pedestrian crossing phase ($30,000 per intersection)	Combined intersections to make a corridor

Table B2: Intersections Studied in the Safety Strategy

Street 1	Street 2	Short Term Countermeasures	Long Term Countermeasures	Other Improvements
7TH ST	HARRISON ST	• Install pedestrian countdown timers at each crossing • Install pedestrian activation buttons at each crossing • Implement Leading Pedestrian Interval (LPI) at each crossing • Integrate protected northbound right turn phase		High Safety Improvement Program -2016-Construct safety improvements at 13 intersections, including signal mast arms, vehicle/bicycle detection, accessible pedestrian signal upgrade, and other improvements
8TH ST	MARKET ST	• Restripe each crosswalk • Install pedestrian countdown timers at each crossing • Install pedestrian activation buttons at each corner • Convert each device to fixed pedestrian recall • Implement pedestrian safety zones extending from the curb at the intersection	• Add lighting for crosswalks across Market St • Convert eastbound and westbound left-turn phase to protected left-turn phase • Extend medians to create pedestrian refuge islands on north and south legs • Install curb extensions on each corner	
GRAND AVE	STATEN AVE	• Re-stripe each marked crosswalk • Install pedestrian countdown timers at each crossing • Implement Leading Pedestrian Interval (LPI) at each crossing • Prohibit right turn on red on each approach	• Convert eastbound and westbound permissive left turn phase to protected left turn phase • Integrate eastbound and westbound protected right turn phase	
HIGH ST	SAN LEANDRO ST	• Remove “Sidewalk Closed” sign on northeast approach • Prohibit right turn on red on each approach • Install pedestrian activation buttons on each corner except southwest ($8,000 per intersection) • Implement Leading Pedestrian Interval (LPI) at each crossing	• Resurface intersection pavement • Construct sidewalk on north-westbound approach • Reconstruct intersection to accommodate heavy vehicles while providing pedestrian crossing treatments	

Table B3: High Injury Corridors with Associated Funding

Street Name	Start	End	Funding Source/Plan	Treatment
12TH ST	JEFFERSON ST	OAK ST	AC Transit Bus Rapid Transit	Pedestrian Improvements included as part of East Bay Bus Rapid Transit
14TH ST	MYRTLE ST	OAK ST	Funded by Active Transportation Program (ATP) 2016	Awarded ATP grant in 2016, between Brush Street and Oak Street, resulting in a reduction of travel lanes from four to two lanes, additional of Class IV protected bicycles lanes, improved pedestrian facilities including refuges, market crossings, and retimed signals, storm drain gardens, and transit boarding islands
8TH ST	FRANKLIN ST	FALLON ST	High Safety Improvement Program (2013)	Upgraded traffic signals on 8th Street and Madison Street, 8th Street and Oak Street. New bikeway striping, repaved, and new ADA curb ramps along the corridor. Identified in LMSA Plan as a community priority for two way conversion, or sidewalk extensions. Downtown Plan calls for 2-wayng the street with a potential parking protected Class IV bike lane
98TH AVE	A ST	MACARTHUR BLVD	High Safety Improvement Program (2012)	98th Avenue Corridor (including intersections with MacArthur Boulevard, Bancroft Avenue, Sunnyside Street, Holly Street, International Boulevard, D Street, E Street, Medford Avenue, San Leandro Street, Pippin Street, Walter Avenue. and Edes Avenue, Install advanced "dilemma zone" detection, crosswalks, speed feedback signs; construct bulb-outs
BANCROFT AVE	CHURCH ST	HAVENSCOURT BLVD	High Safety Improvement Program (2016)	Install HAWKs and RRFBs at eleven locations along the corridor; install signal mast arms at three locations; and install a landscape at the northeast corner of Bancroft and 67th Street. Corridor improvements from Havenscourt to 98th Ave
BROADWAY	9TH ST	19TH ST	AC Transit's East Bay Bus Rapid Transit (BRT)	Pedestrian Improvements funded through the BRT. Includes new ADA curb ramps as well as pedestrian access to new stations. Included in downtown Oakland specific plan (Broadway from Embarcadero to 27th Street). Specific sections included in safety strategy
FOOTHILL BLVD	RUTHERFORD ST	40TH AVE	Former Redevelopment Streetscape	Partially funded. Streetscape improvements funded through Redevelopment, from Mitchell Street to Rutherford Street
FOOTHILL BLVD	51ST AVE	SEMINARY AVE	Former Redevelopment Streetscape	Partially included in the safety strategy, unfunded from Trask St to Seminary Ave

Table B3: High Injury Corridors with Associated Funding (cont.)

Street Name	Start	End	Funding Source/Plan	Treatment
FRUITVALE AVE	ALAMEDA AVE	E 16TH ST	High Safety Improvement Program (2016), Safe Routes to School, Measure B	Fruitvale Alive Project, widened sidewalks, high visibility crosswalks, bulbouts, improved pavement, lighting, and pedestrian signal upgrades
GRAND AVE	LAKE PARK AVE	OAKLAND AVE	High Safety Improvement Program (2013)	Grand Avenue Road Diet, (Grand Avenue from Jean Street to Oakland Avenue is in Piedmont)
INTERNATIONAL BLVD	HIGH ST	56TH AVE	East Bay Bus Rapid Transit	Pedestrian Improvements included as part of East Bay Bus Rapid Transit
INTERNATIONAL BLVD	16TH AVE	28TH AVE	East Bay Bus Rapid Transit	Pedestrian Improvements included as part of East Bay Bus Rapid Transit
INTERNATIONAL BLVD	73RD AVE	91ST AVE	East Bay Bus Rapid Transit	Pedestrian Improvements included as part of East Bay Bus Rapid Transit
INTERNATIONAL BLVD	1ST AVE	12TH AVE	East Bay Bus Rapid Transit	Pedestrian Improvements included as part of East Bay Bus Rapid Transit
INTERNATIONAL BLVD	95TH AVE	DURANT AVE	East Bay Bus Rapid Transit	Pedestrian Improvements included as part of East Bay Bus Rapid Transit
INTERNATIONAL BLVD	HIGH ST	FRUITVALE AVE	East Bay Bus Rapid Transit	Pedestrian Improvements included as part of East Bay Bus Rapid Transit
MACARTHUR BLVD	FOOTHILL BLVD	82ND AVE	Former Redevelopment Streetscape	Streetscape which included bulbouts, ADA curbramps, and high visibility crosswalks from Foothill Boulevard to 77th Avenue. Included in pedestrian safety strategy from 77th Avenue to 83rd Avenue
MARTIN LUTHER KING JR WAY	29TH ST	40TH ST	-	Road Diet, on Martin Luther King Jr Way from West Grand Avenue to 40th Street

Table B3: High Injury Corridors with Associated Funding (cont.)

Street Name	Start	End	Funding Source/Plan	Treatment
SHATTUCK AVE	45TH ST	55TH ST	High Safety Improvement Program (2015)	Bike lanes, potential plaza on 45th and Shattuck
TELEGRAPH AVE	WILLIAM ST	27TH ST	Active Transportation Program, High Safety Improvement Program (2015)	ATP: This project is located along Telegraph Avenue, between 20th Street and 38th Street. Project will construct pedestrian and bicycle safety enhancements, including Class II bicycle lanes, median refuge islands, pedestrian crossing beacons, traffic signal upgrades, and transit boarding islands
TELEGRAPH AVE	30TH ST	51ST ST	Active Transportation Program, Highway Safety Improvement Program (2015)	ATP: This project is located along Telegraph Avenue, between 20th Street and 38th Street. Project will construct pedestrian and bicycle safety enhancements, including Class II bicycle lanes, median refuge islands, pedestrian crossing beacons, traffic signal upgrades, and transit boarding islands. HSIP: Stripe and sign road diet with buffered bike lanes between 29th and 41st Sts; install signal modifications at 29th and 45th Sts; install uncontrolled crosswalk enhancements, painted bulb-outs, and painted median refuges
TELEGRAPH AVE	WILLIAM ST	BROADWAY	Some Measure B funding, Alameda County Transportation Commission (ACTC) and Housing and Community Development (HCD) funds, Transportation Services Division (TSD) and paving program funds	Completed as part of Latham and complete streets work, Intersection of Telegraph and 17th is not funded

Table B4: High Injury Intersections with Associated Funding

Street 1	Street 2	Funding Source	Treatment
14TH ST	MARKET ST	High Safety Improvement Program (2015)	Install uncontrolled crosswalk enhancements, such as RRFBs, ladder striping, raised bulb-outs, and raised median refuges at multiple locations
21ST AVE	INTERNATIONAL BLVD	East Bay Bus Rapid Transit	Pedestrian Improvements included as part of East Bay Bus Rapid Transit
24TH ST	BROADWAY	Improvement by private developer	RRFP installed
29TH ST	TELEGRAPH AVE	Active Transportation Program, High Safety Improvement Program (2015)	This project is located along Telegraph Avenue, between 20th Street and 38th Street. Project will construct pedestrian and bicycle safety enhancements, including Class II bicycle lanes, median refuge islands, pedestrian crossing beacons, traffic signal upgrades, and transit boarding islands
33RD AVE	FOOTHILL BLVD	Redevelopment/One Bay Area Grant (OBAG)	Streetscape project
34TH ST	MARTIN LUTHER KING JR WAY	Redevelopment/OBAG	Martin Luther King Jr. Way streetscape project & road diet
34TH ST	SAN PABLO AVE	High Safety Improvement Program (2011)	RRFB's and other crossing improvements at 32nd Street/Brockhurst Sreet/34th Street at San Pablo
35TH AVE	INTERNATIONAL BLVD	East Bay Bus Rapid Transit	Pedestrian Improvements included as part of East Bay Bus Rapid Transit

Table B4: High Injury Intersections with Associated Funding (cont.)

Street 1	Street 2	Funding Source	Treatment
37TH ST	TELEGRAPH AVE	Active Transportation Program, High Safety Improvement Program (2015)	ATP: This project is located along Telegraph Avenue, between 20th Street and 38th Street. Project will construct pedestrian and bicycle safety enhancements, including Class II bicycle lanes, median refuge islands, pedestrian crossing beacons, traffic signal upgrades, and transit boarding islands
52ND AVE	INTERNATIONAL BLVD	East Bay Bus Rapid Transit	Pedestrian improvements included as part of East Bay Bus Rapid Transit
5TH AVE	INTERNATIONAL BLVD	East Bay Bus Rapid Transit	Pedestrian Improvements included as part of East Bay Bus Rapid Transit
76TH AVE	MACARTHUR BLVD	Redevelopment/OBAG	Recent streetscape work on MacArthur Blvd as part of streetscape
80TH AVE	INTERNATIONAL BLVD	East Bay Bus Rapid Transit	Pedestrian Improvements included as part of East Bay Bus Rapid Transit
83RD AVE	INTERNATIONAL BLVD	East Bay Bus Rapid Transit	Pedestrian Improvements included as part of East Bay Bus Rapid Transit
84TH AVE	INTERNATIONAL BLVD	East Bay Bus Rapid Transit	Pedestrian Improvements included as part of East Bay Bus Rapid Transit

Table B4: High Injury Intersections with Associated Funding (cont.)

Street 1	Street 2	Funding Source	Treatment
90TH AVE	INTERNATIONAL BLVD	East Bay Bus Rapid Transit	Pedestrian Improvements included as part of East Bay Bus Rapid Transit
98TH AVE	CHERRY ST	-	Paving/complete streets project in process, plus RRFB installed as SRTS in 2015
98TH AVE	INTERNATIONAL BLVD	East Bay Bus Rapid Transit	Pedestrian Improvements included as part of East Bay Bus Rapid Transit
9TH ST	MADISON ST	-	Lake Merritt BART Bikeways; road diet on Madison Street, also included in corridor study
E 16TH ST	FRUITVALE AVE	High Safety Improvement Program (2016)	RRFB installed as SRTS project 2015 install new Class II bicycle lanes, enhanced safety features at pedestrian crossings, and a new protected left turn phase at Foothill Boulevard
E 19TH ST	FRUITVALE AVE	High Safety Improvement Program (2016)	RRFB installed as SRTS project 2015 install new Class II bicycle lanes, enhanced safety features at pedestrian crossings, and a new protected left turn phase at Foothill Boulevard
GRAND AVE	HARRISON ST	Measure DD	Lakeside Green Streets project

Table B4: High Injury Intersections with Associated Funding (cont.)

Street 1	Street 2	Funding Source	Treatment
MACARTHUR BLVD	MARTIN LUTHER KING JR WAY	-	Streetscape project as part of MacArthur Transit Hub
SAN PABLO AVE	W GRAND AVE	High Safety Improvement Program (2011)	Install protected left-turn phasing; modify intersection

Table B5: High Injury Corridors with No Associated Funding

Street Name	Start	End	Comments
7TH ST	WASHINGTON ST	7TH ST BRIDGE	Currently studied as part of the Lake Merritt Station Area Plan, Downtown Specific Plan, and Freeway Circulation Plan. Improvements from E7th Street East of Fallon to Bridge includes reducing three right turn lanes to two right-turn lanes, an expanded median island for a pedestrian refuge, enhanced pedestrian crosswalks, and signalized midblock crosswalks. Class II bike lane added. As part of the Downtown Specific Plan, 7th Street between Fallon and Castro is identified as a street for improvements, including conversion to a two-way. The Alameda Access Project Study, currently in environmental phase, is also looking at 7th Street from Adeline Street to Fallon Street
8TH ST	FRANKLIN ST	FALLON ST	Upgraded traffic signals on 8th Street and Madison Street, 8th Street and Oak Street. New bikeway striping, repaved, and new ADA curb ramps along the corridor. Identified in LMSA Plan as a community priority for two way conversion, or sidewalk extensions. Downtown Plan calls for 2-waying the street with a potential parking protected Class IV bike lane
FOOTHILL BLVD	RUTHERFORD ST	MITCHELL ST	Partially funded. Streetscape improvements funded through Redevelopment, from Rutherford to High St
FOOTHILL BLVD	TRASK ST	SEMINARY AVE	Partially included in the safety strategy. Unfunded from Trask St to Seminary Ave
HEGENBERGER RD	HEGENBER PL	HEGENBERGER LP	Identified in 2016 using 2014 data
MARTIN LUTHER KING JR WAY	40TH ST	44TH ST	Identified in 2016 using 2014 data
PIEDMONT AVE	WARREN AVE	ENTRADA AVE	Identified in 2016 using 2014 data
TELEGRAPH AVE	51ST ST	SR 24	To be studied as part of Phase II of Telegraph Avenue Complete Streets Plan
14TH ST	MYRTLE ST	BRUSH ST	-

Table B6: High Injury Intersections with No Associated Funding

STREET 1	STREET 2	Comments
27TH ST	BROADWAY	Developer proposing a bulbout on the SE side of Broadway and 27th. Rest of intersection remains unfunded
48TH ST	TELEGRAPH AVE	Phase II of Telegraph Avenue Complete Streets Plan
51ST ST	TELEGRAPH AVE	Phase II of Telegraph Avenue Complete Streets Plan
17TH ST	TELEGRAPH AVE	-
BRUSH ST	W GRAND AVE	-
COOLIDGE AVE	SCHOOL ST	-
E 27TH ST	FRUITVALE AVE	-

Pedestrian Safety Solutions Toolbox

Signalized Intersections

PROTECTED RIGHT TURN PHASE

Magnitude Cost: $3,000 – 5,000[3]

Protected right turn phases may be used where vehicle and pedestrian volumes are high to separate the two conflicting movements.

Portland, OR

Benefits

- Reduces conflicts and collisions between right-turning motorists and pedestrians.

Constraints

- Increases pedestrian wait time at crossings
- Requires right-turn only lane.

Typical Applications

- Signalized intersections where high right-turning vehicle movements and high volumes of crossing pedestrians.
- Locations with a documented history of right-turning vehicle and pedestrian conflicts or collisions.

Design Considerations

- Protected right turn phases could be considered where:
  - There is inadequate sight distance for pedestrians and vehicles to see each other - inadequate sight distance means insufficient stopping sight distance for motorists and/or pedestrians do not have sufficient line of sight to judge a safe gap to cross based on prevailing vehicle speeds;
  - Geometric or operational characteristics may result in unexpected conflicts;
  - There are an unacceptable number of pedestrian conflicts with right-turn movements;
  - Heavy pedestrian volumes; and
  - Heavy right-turning vehicle volumes.

Additional Guidance

- *California Manual on Uniform Traffic Control Devices*

Pedestrian Safety Solutions Toolbox
Signalized Intersections

MODIFY SIGNAL TIMING

Magnitude Cost: $1,000 – $3,500 (per intersection)[4]


OC&E Trail, *Klamath Falls, OR*

Adjusting existing signal timings to better accommodate pedestrians. This could include reducing the amount of vehicular green time to decrease pedestrian wait time at signals.

Benefits

- Provides additional crossing times and reducing wait times.
- Can be used to manage vehicle speeds along a corridor.

Constraints

- Improving conditions for one mode is often done at the expense of others (e.g. increased delay).

Typical Applications

- Signalized intersections where pedestrian cross times are inadequate for pedestrian volumes.
- Locations with a documented crash history of pedestrians frequently crossing against the signal.
- Along a corridor signal timing could be modified to help manage vehicle speeds – e.g., establishing progression for a vehicle speed of 13 mph.

Design Considerations

- Allow pedestrians sufficient time to cross the street, including seniors, children, and people with disabilities.
- A walking speed of 3.5 feet per second should be used to calculate the minimum pedestrian clearance interval (flashing red hand plus yellow and any all-red phases).
- Where pedestrians walk slower than 3.5 feet per second, or pedestrians who use wheelchairs routinely use the crosswalk, consider a walking speed of less than 3.5 feet per second.
- Provide a walk interval at least 7 seconds long to allow time for a pedestrian to leave the curb or shoulder before the clearance time begins.

Additional Guidance

- *California Manual on Uniform Traffic Control Devices*
- NACTO *Urban Street Design Guide*

Pedestrian Safety Solutions Toolbox

Signalized Intersections

CONVERT PERMISSIVE PHASE TO PROTECTED OR PROTECTED/PERMISSIVE PHASING

Magnitude Cost: $3,000 - $5,000[5]

Adjust signal phasing to allow left-turning vehicles a protected or protected/permissive left-turn phase instead of a permissive phase.

Benefits

- Reduce left-turning conflicts with pedestrians and vehicles
- Improve vehicle turning-related safety for pedestrians and improve safety for left-turning motorists.
- Improve left-turning operations

Constraints

- Less green time for through and right turn movements
- Less green time for pedestrian crossings

Typical Applications

- Signalized intersections where left-turning vehicle-pedestrian crashes are frequent.
- Signalized intersections where left-turning vehicles and pedestrians have frequent conflicts.

Design Considerations

- Consider protected or protected/permissive phasing at intersections with a history of left-turning collisions, where pedestrian-vehicle turning conflicts are high, and intersections with large skews.

Additional Guidance

- *California Manual on Uniform Traffic Control Devices*
- *NCHRP Report 617: Accident Modification Factors for Traffic Engineering and ITS Improvements*
- FHWA *Toolbox of Countermeasures and Their Potential Effectiveness for Pedestrian Crashes*
- NACTO *Urban Street Design Guide*

Pedestrian Safety Solutions Toolbox

Signalized Intersections

INSTALL PEDESTRIAN COUNTDOWN TIMERS

Magnitude Cost: $300 - $1,000 (per device)[6]

Static Walk/Don't Walk pedestrian signals with countdown signal informing pedestrians of the time remaining to cross the street.

Orlando, FL

Benefits

- Fewer pedestrians cross the street late in the countdown as compared to signal heads with only the Flashing Don't Walk light

Constraints

- Typically a network-wide or subarea wide treatment to create consistency for road-users, but it expensive to implement throughout an area

Typical Applications

- Signalized intersections
- Particularly useful to pedestrians for longer distance crossings so pedestrians know how much time remains before signal changes
- May be useful where crash or conflict patterns indicate pedestrians cross frequently against the signal

Design Considerations

- Countdown pedestrian signals are particularly suitable for crosswalks where the pedestrian change interval is more than 7 seconds to inform pedestrians of the number of seconds remaining in interval.
- Where they are installed, push buttons to activate the pedestrian signal should be easily accessible by pedestrians, wheelchair users, and bicyclists for each crossing.

Additional Guidance

- *California Manual on Uniform Traffic Control Devices*
- NACTO *Urban Street Design Guide*

Pedestrian Safety Solutions Toolbox

Signalized Intersections

IMPLEMENT LEADING PEDESTRIAN INTERVAL (LPI)

Magnitude Cost: $1,000 - $2,000[7]


Orlando, FL


Sacramento, CA

A leading pedestrian interval gives pedestrians a 2-5 second head start before the concurrent vehicle phase turns green to allow pedestrians to enter and occupy the crosswalk before turning vehicles get there.

Benefits

- Pedestrians are more visible in the crosswalk before vehicles start moving.
- Helps reduce conflicts with pedestrians and turning vehicles.
- Relatively low cost to implement

Constraints

- Reduces green time for vehicle movements.
- May add to delays at intersections operating near capacity.

Typical Applications

- Intersections where frequent turning vehicle movements make pedestrian crossing movements uncomfortable.
- Intersections with a documented history of turning movement-related vehicle-pedestrian crashes.

Design Considerations

- The leading pedestrian interval should give a minimum head start of 3-7 seconds depending on crossing distance.
- May be combined with a curb extension to improve visibility at high-conflict intersections.

Additional Guidance

- *California Manual on Uniform Traffic Control Devices*
- ITE *Traffic Engineering Handbook*
- ITE/FHWA *Traffic Calming: State of the Practice*
- NACTO *Urban Street Design Guide*

Pedestrian Safety Solutions Toolbox

Signalized Intersections

IMPLEMENT FLASHING YELLOW ARROW (FYA)

Magnitude Cost: $7,500[8]

A flashing yellow arrow with a leading pedestrian interval gives pedestrians a 2-5 second period when vehicles may turn if no conflicts are present but must yield to crossing pedestrians.

Portland, OR

Benefits

- Intended to communicate to motorists that caution should be used in making maneuver and motorists must yield to oncoming vehicles and crossing pedestrians
- Relatively low cost to implement

Constraints

- Reduces green time for vehicle movements.
- May add to delays at intersections operating near capacity.
- Does not provide a protected head start for pedestrians

Typical Applications

- Intersections where frequent turning vehicle movements make pedestrian crossing movements uncomfortable.
- Intersections with a documented history of turning movement-related vehicle-pedestrian crashes.

Design Considerations

- The FYA leading pedestrian interval should give a minimum head start of 3-7 seconds depending on crossing distance.
- May be combined with a curb extension to improve visibility of and for pedestrians.

Additional Guidance

- *California Manual on Uniform Traffic Control Devices*
- *Improved Pedestrian Safety at Signalized Intersections Operating the Flashing Yellow Arrow*

Pedestrian Safety Solutions Toolbox

Marked Uncontrolled Crosswalks at Two-Way Stop-Controlled Locations

INSTALL RAISED INTERSECTION/PEDESTRIAN CROSSING ★

Magnitude Cost: $10,000 – $50,000 (per crossing/intersection)[9]

A pedestrian crossing or intersection area raised vertically to give motorists and pedestrians a better view of the crossing area. A raised crosswalk is essentially a speed table marked and signed for pedestrian crossing.

Benefits

- Increases visibility of pedestrians by motorists
- Slows motorists' travel speeds

Constraints

- Can be difficult to navigate for large trucks and buses.
- May present drainage challenges
- Emergency response times may be increased

Typical Applications

- Two-lane roadways where pedestrians volumes are high (greater than 50 pedestrians per hour) and vehicle speed control is needed.
- Locations where low-volume streets intersect with high-volume streets or where a street changes its street type or functions.
- Locations where conflict and/or crash patterns reflect vehicle-pedestrian crashes due to unsafe speeds and failure to yield to pedestrians.

Design Considerations

- Locate raised intersection/crossings where vehicles have adequate stopping sight distance to see and slow. Consider nighttime visibility.
- Challenging locations for raised crosswalks include designated transit routes or at locations with steep grades or sharp curves.
- Raised crosswalks should be long enough to allow a passenger vehicle's front and rear wheels to be on top of the table at the same time. Average wheelbase for passenger vehicles is about 9 feet.[10]
- Consider drainage patterns resulting from installation and consider impacts on emergency response times.

Additional Guidance

- ITE/FHWA *Traffic Calming: State of the Practice*
- *California Manual on Uniform Traffic Control Devices*
- NACTO *Urban Street Design Guide*

Pedestrian Safety Solutions Toolbox

Marked Uncontrolled Crosswalks at Two-Way Stop-Controlled Locations

INSTALL RAISED MEDIAN/REFUGE ISLANDS

Magnitude Cost: $15,000 – 25,000 (per island)[11]

Provides a raised refuge area in the median for pedestrians to stop while crossing the street. Can also help narrow roadway cross-section to slow vehicle speeds.

Benefits

- Creates possibility of two-stage crossings for pedestrians
- Can be used as a gateway to high pedestrian activity
- Can be used to help slow vehicle speeds

Constraints

- Must have at least 6 feet of space to accommodate wheelchairs; not all streets will have adequate space
- Physical barrier in the street

Typical Applications

- Intersections where:
  - pedestrians volumes are greater than 20 pedestrians per hour;
  - vehicle ADT volumes are greater than 12,000; and,
  - sufficient width to provide a refuge (minimum of 6 feet).
- Locations with a high frequency of pedestrian crashes.
- Locations with long blocks and vehicle speeds are higher than desired or posted.
- Multilane roadways with pedestrian crossing needs

Design Considerations

- Raised median/refuge island should be located in places where pedestrians commonly cross (e.g., transit stops, schools, etc.)
- Can be located at intersection crossings as well as midblock crossings

Additional Guidance

- *California Manual on Uniform Traffic Control Devices*

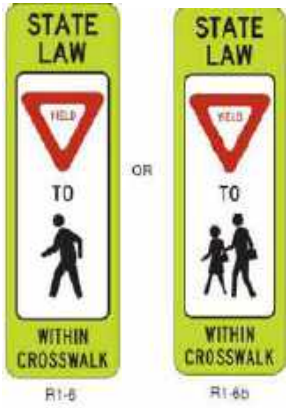
Pedestrian Safety Solutions Toolbox

Marked Uncontrolled Crosswalks at Two-Way Stop-Controlled Locations

INSTALL IN-STREET "YIELD FOR PEDESTRIANS" SIGNS ★

Magnitude Cost: $800 (per crossing)[12]

Signs placed in the middle of opposing travel lanes to increase driver awareness of pedestrians and the legal responsibility to yield right-of-way to pedestrians in the crosswalk.



Benefits

- Increases the number of motorists that yield to pedestrians in the crosswalk
- Reinforces the right of pedestrians in the travel-way

Constraints

- If used too often, motorists may ignore the signs
- Less effective on higher volume streets
- May require more maintenance than roadside signs.

Typical Applications

- Undivided two-lane road locations near schools and other pedestrian generators.
- In-street "Yield for Pedestrians" signs are commonly used in areas with lower vehicle volumes, low speeds (less than 35 mph), and poor yielding rates by motorists.
- Crash or conflict patterns resulting in vehicle-pedestrian crashes related to failure to yield by vehicles or unsafe speeds.

Design Considerations

- Per the *California MUTCD* (Section 2B.12), the in-street sign(s) should be placed in the roadway at the crosswalk location on the center line, lane line, or on a median island.
- Consider vehicle clearance widths for roadway design vehicles to avoid signs being hit.
- Use in-streets signs strategically, overuse will lead to lower compliance.

Additional Guidance

- *California Manual on Uniform Traffic Control Devices*

Pedestrian Safety Solutions Toolbox

Marked Uncontrolled Crosswalks at Two-Way Stop-Controlled Locations

STRIPE ADVANCE STOP AND YIELD LINES

Magnitude Cost: $1,000 (per crossing)[13]

Advance stop and yield lines reduce vehicle encroachment into the crosswalk, improve drivers' view of pedestrians, and reduce multiple threat situations for pedestrians.

R1-5

Benefits

- Increase pedestrian-motorist visibility at the crosswalk.
- Reduce multiple threat situations for pedestrians

Constraints

- May interfere with vehicle operations and contribute to queuing at congested locations.
- Potential sign clutter

Typical Applications

- At multilane locations where marked crosswalks are present and vehicular ADT is greater than 12,000 per day.
- At intersections where pedestrian volumes are greater than 20 per day and vehicular ADT is greater than 8,000 per day.
- At locations where vehicle encroachment into the crosswalk is common.
- In advance of Rectangular Rapid Flashing Beacons and Pedestrian Hybrid Beacons

Design Considerations

- Yield lines should be placed 4 to 50 feet in advance of controlled marked crosswalks based; distance is based on vehicle speeds, street width, on-street parking, nearby land uses, and demand for queuing space.
- Yield lines should be placed a minimum of 4 feet in advance of uncontrolled marked crosswalk locations.

Additional Guidance

- *California Manual on Uniform Traffic Control Devices*

Pedestrian Safety Solutions Toolbox

Marked Uncontrolled Crosswalks at Two-Way Stop-Controlled Locations

RESTRICT PARKING AT INTERSECTION APPROACHES

Magnitude Cost: $600 (per approach)[14]

Red parking zones on the approaches to an intersection or crosswalk allow for improved sight distance between pedestrians waiting to cross or entering the crosswalk and approaching motorists.

Benefits

- Increase pedestrian-motorist visibility at the crosswalk.

Constraints

- Reduces available parking supply in area of restriction.

Typical Applications

- Locations where sight distance is currently limited and could be improved by removing parked vehicles.
- Locations with a history of frequent collisions or other documented safety concerns.

Design Considerations

- Each location should be evaluated to determine whether parking removal is appropriate.
- A minimum 10 foot red zone should be painted on all crosswalk approach legs.
- Longer red zones should be used at locations with a greater need for improved visibility due to unique sight distances, higher vehicle speeds, road geometry, or other conditions.

Additional Guidance

- *California Manual on Uniform Traffic Control Devices*

Pedestrian Safety Solutions Toolbox

Marked Uncontrolled Crosswalks at Two-Way Stop-Controlled Locations

INSTALL PEDESTRIAN LIGHTING

Magnitude Cost: $6,000 (per light)[15]

Pedestrian lighting may increase nighttime street visibility for pedestrians where existing illumination does not readily address crossing locations.

Denmark, Credit: Dan Burden

Benefits

- Increases visibility of pedestrians waiting to cross and in the crossing.

Constraints

- Potential to restrict and/or clutter sidewalk environment near the crosswalk.

Typical Applications

- Crossings or areas with high levels of nighttime pedestrian activity (e.g., greater than 20 pedestrians per hour).
- Locations with a high frequency of nighttime pedestrian crashes.
- Could also be considered for crossings with lower pedestrian volume activity if crossing conflict is severe or unexpected (e.g., pedestrian crossing location across a higher speed roadway).

Design Considerations

- Illumination could be used to contribute to the identity of a district or neighborhood and serve as a unifying element in the streetscape.
- Lighting should be scaled to the street and land use contexts to avoid light pollution/trespass and ensure a comfortable illumination quality for users.

Additional Guidance

- *California Manual on Uniform Traffic Control Devices*

Pedestrian Safety Solutions Toolbox

Marked Uncontrolled Crosswalks at Two-Way Stop-Controlled Locations

REDUCE CORNER RADII

Magnitude Cost: $15,000 - $60,000 (per corner)[16]

Reduces right-turning vehicle speeds at an intersection by forcing sharper turns. Reduced corner radii also shorten crossing distances for pedestrians.

Benefits

- Reduces right-turning vehicle speeds at the intersection.
- Reduces pedestrian exposure by reducing crossing distance.

Constraints

- Potential drainage changes needed in some retrofits.
- Less effective at reducing speeds before and after turns.

Typical Applications

- Intersections with average right-turn speeds above 15 miles per hour and where pedestrian volumes are greater than 20 pedestrians per hour.
- Intersections with a documented crash history of right-turning vehicle and pedestrian conflicts.

Design Considerations

- Corner curb radii should accommodate the roadway type's design vehicle turning movements.
- A smaller curb radius expands the pedestrian area and allows for better pedestrian ramp/crosswalk alignment.
- Minimize effective turning radius where possible.
- Consider existing drainage infrastructure needs for modifications.

Additional Guidance

- *California Manual for Uniform Traffic Control Devices*
- NACTO *Urban Street Design Guide*

Pedestrian Safety Solutions Toolbox

Marked Uncontrolled Crosswalks at Midblock Locations

INSTALL PEDESTRIAN SIGNAL

Magnitude Cost: $225,000 (per installation)

Provides pedestrians with a signal-controlled crossing at a mid-block location or at a previously stop-controlled intersection where pedestrian volumes warrant full signalization. The signal remains green for the mainline traffic movement until actuated by a push button to call a red signal for traffic.

Beaverton, OR

Tucson, AZ

Benefits

- Has nearly 100 percent rate of motorist yielding behavior at crossing locations.
- Same appearance as standard traffic signal, so motorist understanding is high.

Constraints

- Must be activated by pedestrians.
- More costly than other crossing treatments.

Typical Applications

- Locations meeting traffic signal warrants for pedestrians as defined in the California MUTCD (Part 4).
- Locations where there are conflict or crash patterns between vehicle-pedestrians.
- Typical applications include:
  - Locations with four or more lanes and vehicle volumes greater than 15,000 per day
  - Locations with pedestrian volumes greater than 20 per hour and speed limits greater than 35 mph
  - At locations where multi-use paths intersect with roadways.

Design Considerations

- The push button to activate the pedestrian signal should be easily accessible by pedestrians, wheelchair users, and bicyclists (if applicable).

Additional Guidance

- *California Manual on Traffic Control Devices*
- NACTO *Urban Street Design Guide*
- *NCHRP Report 562 Improving Pedestrian Safety at Unsignalized Crossings*

Pedestrian Safety Solutions Toolbox

Marked Uncontrolled Crosswalks at Midblock Locations

INSTALL PEDESTRIAN HYBRID BEACON (PHB)

Magnitude Cost: $150,000 (per installation)[17]

Boise, ID

A pedestrian hybrid beacon is a pedestrian activated display that is unlit when not in use. It begins with a yellow light alerting drivers to slow, and then displays a solid red light requiring drivers to remain stopped while pedestrians cross the street. Finally, the beacon shifts to flashing red lights to indicate motorists may proceed after pedestrians have completed their crossing.

Benefits

- Higher rates of motorists yielding than crosswalks without PHB.
- Reduces pedestrian-involved crashes.
- Less delay to motor vehicle drivers than a signal.

Constraints

- Must be activated by pedestrians.
- More costly than other crossing treatments.
- Initially, may be unfamiliar to motorists.

Typical Applications

- Conditions consistent with the California MUTCD guidance.
- Typical locations include:
  - Locations with four or more lanes and vehicle volumes greater than 15,000 per day
  - Locations with pedestrian volumes greater than 20 per hour and speed limits greater than 35 mph
  - At locations where multi-use paths intersect with roadways.

Design Considerations

- The push button to activate the pedestrian hybrid beacon should be easily accessible by all users.

Additional Guidance

- *California Manual on Uniform Traffic Control Devices*
- NACTO *Urban Street Design Guide*
- *NCHRP Report 562 Improving Pedestrian Safety at Unsignalized Crossings*

[17] Cost includes design, materials, and installation.

Pedestrian Safety Solutions Toolbox

Marked Uncontrolled Crosswalks at Midblock Locations

INSTALL RECTANGULAR RAPID FLASHING BEACON (RRFB)

Magnitude Cost: $30,000 (per installation)


Portland, OR


Beaverton, OR

These crossing treatments include signs that have a pedestrian-activated "strobe-light" flashing pattern to attract motorists' attention and provide awareness of pedestrians and/or bicyclists that are intending to cross the roadway.

Benefits

- Provides a visible warning to motorists at eye level.
- Increases motorists yielding behavior at crossing locations over round yellow flashing beacons (80 to 100 percent compliance).
- Allows motorists to proceed after yielding to pedestrians.

Constraints

- Flashing beacons must be activated by pedestrians.
- Motorists may not understand the flashing lights of the RRFB, so compliance may be lower than with a traffic signal.

Typical Applications

- Midblock crossings with pedestrian volumes of 20 or more pedestrians per hour and documented midblock crossing pedestrian collisions.
- Locations with:
  - three or more lanes and posted speeds of 30 mph or higher without a raised median.
  - three or more lanes and posted speeds of 40 mph with or without a raised median
- Locations where multi-use paths intersect with roadways.

Design Considerations

- The push button should be easily accessible by pedestrians, wheelchair users, and bicyclists (if applicable).
- Consider adding a push button in the median island for crossings of multi-lane facilities.
- Automated pedestrian detection may also be installed; it would increase cost of installation.

Additional Guidance

- *California Manual on Uniform Traffic Control Devices*
- NCHRP *Report 562 Improving Pedestrian Safety at Unsignalized Crossings*

Pedestrian Safety Solutions Toolbox

Marked Uncontrolled Crosswalks at Midblock Locations

INSTALL CROSSING ISLAND (PEDESTRIAN REFUGE)

Magnitude Cost: $15,000 – $25,000 (per crossing island)[18]

Portland, OR

Portland, OR

Provides a raised refuge area in between opposing travel streams for pedestrians to stop while crossing the street. They can be used at intersections or mid-block crossings.

Benefits

- Reduces pedestrian exposure at marked and unmarked crosswalks.
- Requires shorter gaps in traffic to cross the street by allowing pedestrians to cross in two phases.
- Can help reduce vehicle speeds.

Constraints

- Streets with constrained right-of-way may not have sufficient width to allow for a crossing island.

Typical Applications

- Four or more lane roadways without a raised median where:
  - Posted speeds are 30 mph or less and vehicular ADT is between 9,000 and 12,000 per day.
  - Posted speeds are 35 mph and vehicular ADT is 9,000 per day or less.
- Often used in areas with high levels of vulnerable pedestrian users, such as near schools or senior centers/housing, or a demonstrated pedestrian crash history.

Design Considerations

- Must have at least 6 feet of clear width to accommodate people using wheelchairs.
- At crossing locations where bicyclists are anticipated, a width of 10 feet or greater is desirable to accommodate bicycles with trailers or groups of bicyclists.
- Can be applied in conjunction with other treatments.

Additional Guidance

- *California Manual for Uniform Traffic Control Devices*
- NACTO *Urban Streets Design Guide*
- *NCHRP Report 562 Improving Pedestrian Safety at Unsignalized Crossings*

[18] Cost range varies from installation alone at the low end to design and installation at the high end.

Pedestrian Safety Solutions Toolbox

Marked Uncontrolled Crosswalks at Midblock Locations

INSTALL CURB EXTENSIONS

Magnitude Cost: $15,000 (per extension)[19]

An extension of the curb or the sidewalk into the street, usually at an intersection, that narrows the vehicle path, inhibits fast turns, and shortens the crossing distance for pedestrians.


Boston, MA


Bend, OR

Benefits

- Shortens crossing distances for pedestrians.
- Reduces motorist turning speeds.
- Increases visibility between motorists and pedestrians.
- Enables permanent parking
- Enables tree and landscape planting and water runoff treatment.

Constraints

- More easily implemented on streets with on-street parking.
- Physical barrier can be exposed to traffic.
- Greater cost and time to install than standard crosswalks.
- Can present turning radius problems to large vehicles.

Typical Applications

- Mid-block or intersection pedestrian crossings on streets with unrestricted on-street parking.
- Crossing locations with pedestrian collision history.
- Streets with on-street parking where:
  - pedestrian volumes ≥ 20 pedestrians per hour;
  - ADT ≥ 1,500 vehicles per day; and,
  - average right-turn speeds ≥ 15 mph.

Design Considerations

- Include a passage for bicycles to prevent conflicts with vehicles.
- Provide accessible curb ramps and detectible warnings.
- Include landscaping on the curb extension to differentiate the pedestrian travel path.

Additional Guidance

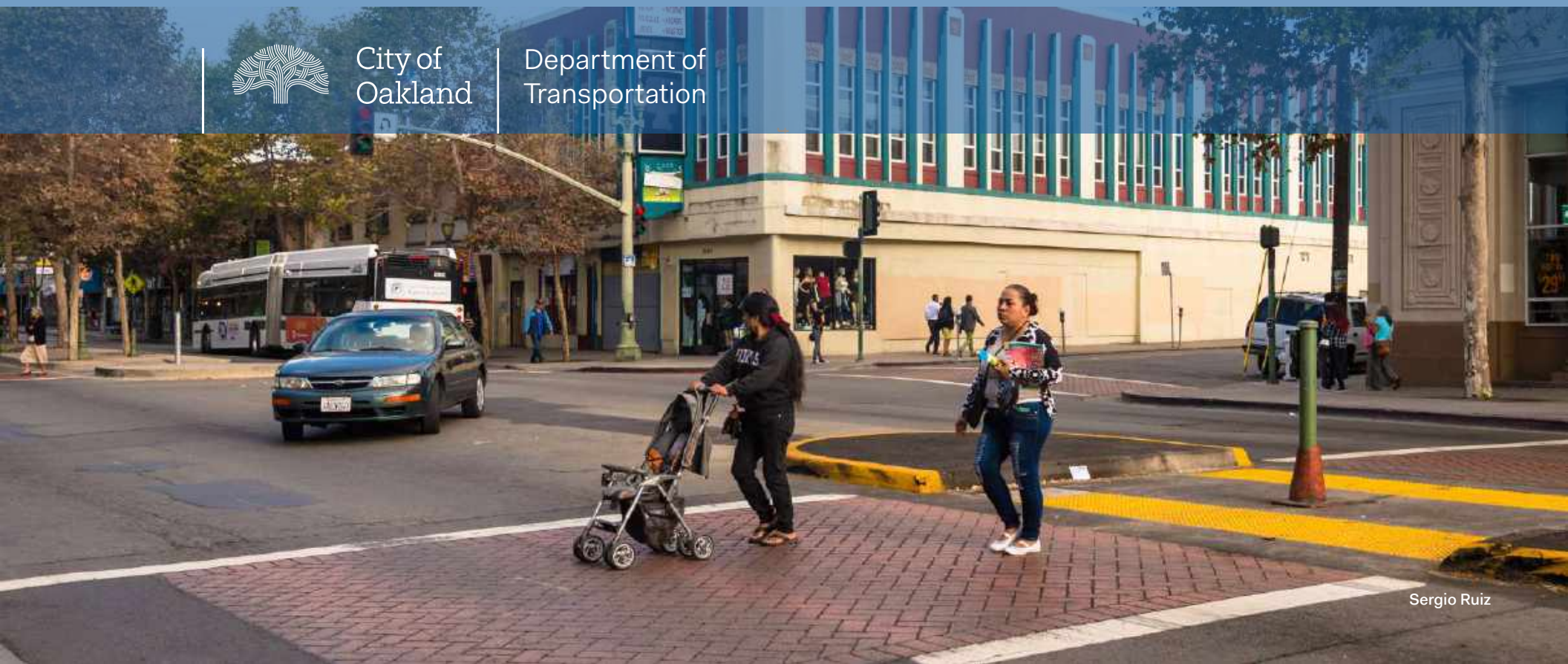
- *California Manual for Uniform Traffic Control Devices*
- ITE/FHWA *Traffic Calming: State of the Practice*
- FHWA *Designing Sidewalks and Trails for Access Part II*

[19] Costs will vary based on the length and drainage requirements.

City of Oakland
Department of Transportation

Appendix C

Oakland Walks! 2017 Pedestrian Plan Update



Appendix C
Pedestrian Strategy and Solutions Toolbox

TREATMENT TOOLBOX

The pedestrian safety treatments are organized into the following three program areas:

- Signalized Intersections;
- Marked Uncontrolled Crosswalks at Two-Way Stop-Controlled Locations; and
- Marked Uncontrolled Crosswalks at Midblock Locations.

To apply this toolbox to corridors:

- Consider is the corridor over built from a vehicular capacity perspective? Could a road diet be implemented?
  - Road diets reduce the number of vehicle lanes a pedestrian has to cross and also consistently reduces *vehicle speeds.*
  - *Reducing pedestrian* exposure to vehicles and slowing vehicle speeds help lower the risk of pedestrian crashes.
- Identify intersections along the corridor that are higher risk (based on their physical characteristics and crash history) for pedestrian crashes.
  - Depending on the control at these intersections, see the treatments within the signalized intersection toolbox or treatments within the marked uncontrolled crosswalks at two-way stop controlled locations for potential improvements.
  - If there are a number of signalized intersections along the corridor, consider signal timing changes to coordinate the signals to encourage slower vehicle speeds (e.g., coordinate signals to encourage vehicle speeds of 13 mph).
- Identify midblock crossing locations – either existing marked uncontrolled midblock crossing locations or midblock locations that due to surrounding land uses are an attractive location for pedestrians to attempt to cross (e.g., midblock transit stops, commercial uses, schools, parks).
  - See the treatments within the marked uncontrolled crosswalks at midblock locations midblock section of the toolbox.

Table 1 summarizes the treatments provided in the toolbox by program area. Treatments marked with this symbol:  are treatments that may help with managing or slowing vehicle speeds. The toolbox provides more detail on each treatment type including planning level cost ranges or order of magnitude cost values, benefits and constraints, typical applications, and design considerations. Cost ranges were provided by City of Oakland staff unless otherwise noted. References containing additional guidance are provided for each treatment. The guidance in this toolbox should be used alongside the City of Oakland's Crosswalk Policy guidance as well as the City's Pedestrian Safety Guidance for Signalized Intersections Memorandum to identify the most appropriate treatment(s) at a particular location.

Table 1. Toolbox Contents

	Page #	Treatment	Image
Signalized Intersections	S-1	Add Exclusive Pedestrian Phasing	
	S-2	Restrict Right Turn on Red	
	S-3	Protected Right Turn Phase	
	S-4	Modify Signal Timing ★	
	S-5	Convert Permissive Phase to Protected or Protected/Permissive Phasing	
	S-6	Install Pedestrian Countdown Timers	
	S-7	Implement Leading Pedestrian Interval (LPI)	
	S-8	Implement Flashing Yellow Arrow	

Uncontrolled Marked Crosswalks at Two -Way Stop-Controlled Intersections	TWSC-1	Install Raised Intersection or Raised Pedestrian Crossing ★	
	TWSC-2	Install Raised Median to serve as a Pedestrian Refuge Island ★	
	TWSC-3	Install In-Street “Yield for Pedestrians” Signs ★	
	TWSC-4	Stripe Advance Yield Lines	
	TWSC-5	Restrict Parking at Intersection Approaches	
	TWSC-6	Provide Pedestrian Lighting	
	TWSC-7	Reduce Corner Radii ★	

Uncontrolled Marked Crosswalks at Midblock Locations	MB-1	Install a Pedestrian Signal ★	
	MB-2	Install a Pedestrian Hybrid Beacon ★	
	MB-3	Install Rectangular Rapid Flashing Beacon ★	
	MB-4	Install a Crossing Island (i.e., Pedestrian Refuge Island) ★	
	MB-5	Install Curb Extension ★	
	MB-6	Install a Raised Pedestrian Crossing ★	
	MB-7	Install a High Visibility Crosswalk Pavement Markings	
	MB-8	Implement a Road Diet (i.e., reduce the number of vehicle lanes) ★	

Pedestrian Safety Solutions Toolbox
Signalized Intersections

ADD EXCLUSIVE PEDESTRIAN PHASING

Magnitude Cost: $5,000 – 30,000 (per intersection installation)[1]

Exclusive pedestrian phasing, sometimes referred to as a "pedestrian scramble," stops all vehicular movement and allows pedestrians to cross in any direction (including diagonally).

Benefits

- Nearly eliminates all pedestrian-vehicle conflicts
- Allows pedestrians to cross in any direction
- Treatment is already established in the City of Oakland (8th and Webster)

Constraints

- May increase vehicle and/or pedestrian delay due to added phasing and increased cycle lengths
- Increased cycle lengths may encourage pedestrians crossing against the signal
- Additional educational and/or enforcement efforts may be required for consistent compliance.

Typical Applications

- Intersections with patterns of conflicts and/or collisions between crossing pedestrians and turning vehicles combined with high pedestrian crossing volumes.
- Central business district and other high pedestrian volume activity centers.

Design Considerations

- Speech walk messages used at intersections with exclusive pedestrian phasing shall be patterned after the model: "Walk sign is on for all crossings."
- Locate the push button such that it is easily accessible by pedestrians, wheelchair users, and bicyclists.
- Treatment may result in longer cycle lengths at intersections with long diagonal crossing distances; this may increase total delay for pedestrians and motorists at the intersection.
- Impacts to transit operations should be considered.

Additional Guidance

- *California Manual on Uniform Traffic Control Devices*
- *City of Oakland's Pedestrian Safety Guidance for Signalized Intersections*

[1] The low end of the estimated cost range covers signal timing and reprogramming for the additional pedestrian phase while the high end of the estimated cost includes a new controller for the signal, additional pedestrian signal heads, and construction at the intersection.

Pedestrian Safety Solutions Toolbox
Signalized Intersections

RESTRICT RIGHT TURN ON RED

Magnitude Cost: $500-$5000 (per approach)[2]

Mounted signs eliminate the right of motorists to make a right turn at a red light. Can be used full-time or under restricted time intervals.

Benefits

- Reduces conflicts and collisions between motorists and pedestrians

Constraints

- Reduces time motorists have to make a right turn
- Potential vehicle queuing
- Potential vehicle/transit delay

Typical Applications

- Signalized intersections where right-turning movements interfere with crossing pedestrians and pedestrian crossing volumes are high. See below for restriction considerations.

Design Considerations

- Restrictions could be considered where:
  - There is inadequate sight distance for pedestrians and vehicles to see each other – inadequate sight distance means insufficient stopping sight distance for motorists and/or pedestrians do not have sufficient line of sight to judge a safe gap to cross based on prevailing vehicle speeds;
  - Geometric or operational characteristics may result in unexpected conflicts;
  - There is an exclusive pedestrian phase or an exclusive bicycle phase;
  - Heavy pedestrian volumes;
  - School or railroad crossings; and
  - Traffic signal with three or more phases.

Additional Guidance

- *California Manual on Uniform Traffic Control Devices*

[2] The order of magnitude cost covers at the low end the purchase of a "No Right Turn on Red" sign and installation, while the high end costs represents the purchase and installation of a dynamic "No Right Turn on Red" sign.

Pedestrian Safety Solutions Toolbox

Signalized Intersections

PROTECTED RIGHT TURN PHASE

Magnitude Cost: $3,000 – 5,000[3]

Protected right turn phases may be used where vehicle and pedestrian volumes are high to separate the two conflicting movements.

Portland, OR

Benefits

- Reduces conflicts and collisions between right-turning motorists and pedestrians.

Constraints

- Increases pedestrian wait time at crossings
- Requires right-turn only lane.

Typical Applications

- Signalized intersections where high right-turning vehicle movements and high volumes of crossing pedestrians.
- Locations with a documented history of right-turning vehicle and pedestrian conflicts or collisions.

Design Considerations

- Protected right turn phases could be considered where:
  - There is inadequate sight distance for pedestrians and vehicles to see each other - inadequate sight distance means insufficient stopping sight distance for motorists and/or pedestrians do not have sufficient line of sight to judge a safe gap to cross based on prevailing vehicle speeds;
  - Geometric or operational characteristics may result in unexpected conflicts;
  - There are an unacceptable number of pedestrian conflicts with right-turn movements;
  - Heavy pedestrian volumes; and
  - Heavy right-turning vehicle volumes.

Additional Guidance

- *California Manual on Uniform Traffic Control Devices*

[3] The cost range covers retiming and reprogramming the signal and one or two additional signal heads.

Pedestrian Safety Solutions Toolbox
Signalized Intersections

MODIFY SIGNAL TIMING

Magnitude Cost: $1,000 – $3,500 (per intersection)[4]


OC&E Trail, *Klamath Falls, OR*

Adjusting existing signal timings to better accommodate pedestrians. This could include reducing the amount of vehicular green time to decrease pedestrian wait time at signals.

Benefits

- Provides additional crossing times and reducing wait times.
- Can be used to manage vehicle speeds along a corridor.

Constraints

- Improving conditions for one mode is often done at the expense of others (e.g. increased delay).

Typical Applications

- Signalized intersections where pedestrian cross times are inadequate for pedestrian volumes.
- Locations with a documented crash history of pedestrians frequently crossing against the signal.
- Along a corridor signal timing could be modified to help manage vehicle speeds – e.g., establishing progression for a vehicle speed of 13 mph.

Design Considerations

- Allow pedestrians sufficient time to cross the street, including seniors, children, and people with disabilities.
- A walking speed of 3.5 feet per second should be used to calculate the minimum pedestrian clearance interval (flashing red hand plus yellow and any all-red phases).
- Where pedestrians walk slower than 3.5 feet per second, or pedestrians who use wheelchairs routinely use the crosswalk, consider a walking speed of less than 3.5 feet per second.
- Provide a walk interval at least 7 seconds long to allow time for a pedestrian to leave the curb or shoulder before the clearance time begins.

Additional Guidance

- *California Manual on Uniform Traffic Control Devices*
- NACTO *Urban Street Design Guide*

[4] The cost range covers retiming and reprogramming a single intersection at the low end to more complex situations such as adjusting coordinated signals at the high end.

Pedestrian Safety Solutions Toolbox
Signalized Intersections

CONVERT PERMISSIVE PHASE TO PROTECTED OR PROTECTED/PERMISSIVE PHASING

Magnitude Cost: $3,000 - $5,000[5]

Adjust signal phasing to allow left-turning vehicles a protected or protected/permissive left-turn phase instead of a permissive phase.

Benefits

- Reduce left-turning conflicts with pedestrians and vehicles
- Improve vehicle turning-related safety for pedestrians and improve safety for left-turning motorists.
- Improve left-turning operations

Constraints

- Less green time for through and right turn movements
- Less green time for pedestrian crossings

Typical Applications

- Signalized intersections where left-turning vehicle-pedestrian crashes are frequent.
- Signalized intersections where left-turning vehicles and pedestrians have frequent conflicts.

Design Considerations

- Consider protected or protected/permissive phasing at intersections with a history of left-turning collisions, where pedestrian-vehicle turning conflicts are high, and intersections with large skews.

Additional Guidance

- *California Manual on Uniform Traffic Control Devices*
- *NCHRP Report 617: Accident Modification Factors for Traffic Engineering and ITS Improvements*
- FHWA *Toolbox of Countermeasures and Their Potential Effectiveness for Pedestrian Crashes*
- NACTO *Urban Street Design Guide*

[5] The cost range covers retiming and reprogramming the signal and one or two additional signal heads.

Pedestrian Safety Solutions Toolbox
Signalized Intersections

INSTALL PEDESTRIAN COUNTDOWN TIMERS

Magnitude Cost: $300 - $1,000 (per device)[6]

Static Walk/Don't Walk pedestrian signals with countdown signal informing pedestrians of the time remaining to cross the street.

Orlando, FL

Benefits

- Fewer pedestrians cross the street late in the countdown as compared to signal heads with only the Flashing Don't Walk light

Constraints

- Typically a network-wide or subarea wide treatment to create consistency for road-users, but it expensive to implement throughout an area

Typical Applications

- Signalized intersections
- Particularly useful to pedestrians for longer distance crossings so pedestrians know how much time remains before signal changes
- May be useful where crash or conflict patterns indicate pedestrians cross frequently against the signal

Design Considerations

- Countdown pedestrian signals are particularly suitable for crosswalks where the pedestrian change interval is more than 7 seconds to inform pedestrians of the number of seconds remaining in interval.
- Where they are installed, push buttons to activate the pedestrian signal should be easily accessible by pedestrians, wheelchair users, and bicyclists for each crossing.

Additional Guidance

- *California Manual on Uniform Traffic Control Devices*
- NACTO *Urban Street Design Guide*

[6] The cost range covers the device cost and additional installation.

Pedestrian Safety Solutions Toolbox
Signalized Intersections

IMPLEMENT LEADING PEDESTRIAN INTERVAL (LPI)

Magnitude Cost: $1,000 - $2,000[7]


Orlando, FL


Sacramento, CA

A leading pedestrian interval gives pedestrians a 2-5 second head start before the concurrent vehicle phase turns green to allow pedestrians to enter and occupy the crosswalk before turning vehicles get there.

Benefits

- Pedestrians are more visible in the crosswalk before vehicles start moving.
- Helps reduce conflicts with pedestrians and turning vehicles.
- Relatively low cost to implement

Constraints

- Reduces green time for vehicle movements.
- May add to delays at intersections operating near capacity.

Typical Applications

- Intersections where frequent turning vehicle movements make pedestrian crossing movements uncomfortable.
- Intersections with a documented history of turning movement-related vehicle-pedestrian crashes.

Design Considerations

- The leading pedestrian interval should give a minimum head start of 3-7 seconds depending on crossing distance.
- May be combined with a curb extension to improve visibility at high-conflict intersections.

Additional Guidance

- *California Manual on Uniform Traffic Control Devices*
- ITE *Traffic Engineering Handbook*
- ITE/FHWA *Traffic Calming: State of the Practice*
- NACTO *Urban Street Design Guide*

[7] The cost range covers reprogramming of a single crossing to reprogramming an entire intersection.

Pedestrian Safety Solutions Toolbox
Signalized Intersections

IMPLEMENT FLASHING YELLOW ARROW (FYA)

Magnitude Cost: $7,500[8]

A flashing yellow arrow with a leading pedestrian interval gives pedestrians a 2-5 second period when vehicles may turn if no conflicts are present but must yield to crossing pedestrians.


Portland, OR

Benefits

- Intended to communicate to motorists that caution should be used in making maneuver and motorists must yield to oncoming vehicles and crossing pedestrians
- Relatively low cost to implement

Constraints

- Reduces green time for vehicle movements.
- May add to delays at intersections operating near capacity.
- Does not provide a protected head start for pedestrians

Typical Applications

- Intersections where frequent turning vehicle movements make pedestrian crossing movements uncomfortable.
- Intersections with a documented history of turning movement-related vehicle-pedestrian crashes.

Design Considerations

- The FYA leading pedestrian interval should give a minimum head start of 3-7 seconds depending on crossing distance.
- May be combined with a curb extension to improve visibility of and for pedestrians.

Additional Guidance

- *California Manual on Uniform Traffic Control Devices*
- *Improved Pedestrian Safety at Signalized Intersections Operating the Flashing Yellow Arrow*

[8] The cost range covers a new controller or upgrade and replacement of the signal head and labor, per approach.

Pedestrian Safety Solutions Toolbox

Marked Uncontrolled Crosswalks at Two-Way Stop-Controlled Locations

INSTALL RAISED INTERSECTION/PEDESTRIAN CROSSING

Magnitude Cost: $10,000 – $50,000 (per crossing/intersection)[9]

A pedestrian crossing or intersection area raised vertically to give motorists and pedestrians a better view of the crossing area. A raised crosswalk is essentially a speed table marked and signed for pedestrian crossing.

Benefits

- Increases visibility of pedestrians by motorists
- Slows motorists' travel speeds

Constraints

- Can be difficult to navigate for large trucks and buses.
- May present drainage challenges
- Emergency response times may be increased

Typical Applications

- Two-lane roadways where pedestrians volumes are high (greater than 50 pedestrians per hour) and vehicle speed control is needed.
- Locations where low-volume streets intersect with high-volume streets or where a street changes its street type or functions.
- Locations where conflict and/or crash patterns reflect vehicle-pedestrian crashes due to unsafe speeds and failure to yield to pedestrians.

Design Considerations

- Locate raised intersection/crossings where vehicles have adequate stopping sight distance to see and slow. Consider nighttime visibility.
- Challenging locations for raised crosswalks include designated transit routes or at locations with steep grades or sharp curves.
- Raised crosswalks should be long enough to allow a passenger vehicle's front and rear wheels to be on top of the table at the same time. Average wheelbase for passenger vehicles is about 9 feet.[10]
- Consider drainage patterns resulting from installation and consider impacts on emergency response times.

Additional Guidance

- ITE/FHWA *Traffic Calming: State of the Practice*
- *California Manual on Uniform Traffic Control Devices*
- NACTO *Urban Street Design Guide*

[9] The low end of the cost range represents the cost of implementing the treatment as part of a larger project while the high-end of the range represents the costs of the design and installation as a standalone project.

[10] http://www.nhtsa.gov/cars/rules/CAFE/NewPassengerCarFleet.htm

Pedestrian Safety Solutions Toolbox

Marked Uncontrolled Crosswalks at Two-Way Stop-Controlled Locations

INSTALL RAISED MEDIAN/REFUGE ISLANDS

Magnitude Cost: $15,000 – 25,000 (per island)[11]

Provides a raised refuge area in the median for pedestrians to stop while crossing the street. Can also help narrow roadway cross-section to slow vehicle speeds.

Benefits

- Creates possibility of two-stage crossings for pedestrians
- Can be used as a gateway to high pedestrian activity
- Can be used to help slow vehicle speeds

Constraints

- Must have at least 6 feet of space to accommodate wheelchairs; not all streets will have adequate space
- Physical barrier in the street

Typical Applications

- Intersections where:
  - pedestrians volumes are greater than 20 pedestrians per hour;
  - vehicle ADT volumes are greater than 12,000; and,
  - sufficient width to provide a refuge (minimum of 6 feet).
- Locations with a high frequency of pedestrian crashes.
- Locations with long blocks and vehicle speeds are higher than desired or posted.
- Multilane roadways with pedestrian crossing needs

Design Considerations

- Raised median/refuge island should be located in places where pedestrians commonly cross (e.g., transit stops, schools, etc.)
- Can be located at intersection crossings as well as midblock crossings

Additional Guidance

- *California Manual on Uniform Traffic Control Devices*

[11] The low end of the cost range covers implementation while the high end includes design costs.

Pedestrian Safety Solutions Toolbox

Marked Uncontrolled Crosswalks at Two-Way Stop-Controlled Locations

INSTALL IN-STREET "YIELD FOR PEDESTRIANS" SIGNS ★

Magnitude Cost: $800 (per crossing)[12]

Signs placed in the middle of opposing travel lanes to increase driver awareness of pedestrians and the legal responsibility to yield right-of-way to pedestrians in the crosswalk.

Benefits

- Increases the number of motorists that yield to pedestrians in the crosswalk
- Reinforces the right of pedestrians in the travel-way

Constraints

- If used too often, motorists may ignore the signs
- Less effective on higher volume streets
- May require more maintenance than roadside signs.

Typical Applications

- Undivided two-lane road locations near schools and other pedestrian generators.
- In-street "Yield for Pedestrians" signs are commonly used in areas with lower vehicle volumes, low speeds (less than 35 mph), and poor yielding rates by motorists.
- Crash or conflict patterns resulting in vehicle-pedestrian crashes related to failure to yield by vehicles or unsafe speeds.

Design Considerations

- Per the *California MUTCD* (Section 2B.12), the in-street sign(s) should be placed in the roadway at the crosswalk location on the center line, lane line, or on a median island.
- Consider vehicle clearance widths for roadway design vehicles to avoid signs being hit.
- Use in-streets signs strategically, overuse will lead to lower compliance.

Additional Guidance

- *California Manual on Uniform Traffic Control Devices*

[12] Cost range includes the cost of the sign and installation.

Pedestrian Safety Solutions Toolbox

Marked Uncontrolled Crosswalks at Two-Way Stop-Controlled Locations

STRIPE ADVANCE STOP AND YIELD LINES

Magnitude Cost: $1,000 (per crossing)[13]

Advance stop and yield lines reduce vehicle encroachment into the crosswalk, improve drivers' view of pedestrians, and reduce multiple threat situations for pedestrians.

R1-5

Benefits

- Increase pedestrian-motorist visibility at the crosswalk.
- Reduce multiple threat situations for pedestrians

Constraints

- May interfere with vehicle operations and contribute to queuing at congested locations.
- Potential sign clutter

Typical Applications

- At multilane locations where marked crosswalks are present and vehicular ADT is greater than 12,000 per day.
- At intersections where pedestrian volumes are greater than 20 per day and vehicular ADT is greater than 8,000 per day.
- At locations where vehicle encroachment into the crosswalk is common.
- In advance of Rectangular Rapid Flashing Beacons and Pedestrian Hybrid Beacons

Design Considerations

- Yield lines should be placed 4 to 50 feet in advance of controlled marked crosswalks based; distance is based on vehicle speeds, street width, on-street parking, nearby land uses, and demand for queuing space.
- Yield lines should be placed a minimum of 4 feet in advance of uncontrolled marked crosswalk locations.

Additional Guidance

- *California Manual on Uniform Traffic Control Devices*

[13] Cost includes striping, signs, and labor.

Pedestrian Safety Solutions Toolbox

Marked Uncontrolled Crosswalks at Two-Way Stop-Controlled Locations

RESTRICT PARKING AT INTERSECTION APPROACHES

Magnitude Cost: $600 (per approach)[14]

Red parking zones on the approaches to an intersection or crosswalk allow for improved sight distance between pedestrians waiting to cross or entering the crosswalk and approaching motorists.

Benefits

- Increase pedestrian-motorist visibility at the crosswalk.

Constraints

- Reduces available parking supply in area of restriction.

Typical Applications

- Locations where sight distance is currently limited and could be improved by removing parked vehicles.
- Locations with a history of frequent collisions or other documented safety concerns.

Design Considerations

- Each location should be evaluated to determine whether parking removal is appropriate.
- A minimum 10 foot red zone should be painted on all crosswalk approach legs.
- Longer red zones should be used at locations with a greater need for improved visibility due to unique sight distances, higher vehicle speeds, road geometry, or other conditions.

Additional Guidance

- *California Manual on Uniform Traffic Control Devices*

[14] Order of magnitude cost includes parking restriction sign, paint, and labor.

Pedestrian Safety Solutions Toolbox

Marked Uncontrolled Crosswalks at Two-Way Stop-Controlled Locations

INSTALL PEDESTRIAN LIGHTING

Magnitude Cost: $6,000 (per light)[15]

Pedestrian lighting may increase nighttime street visibility for pedestrians where existing illumination does not readily address crossing locations.

Denmark, Credit: Dan Burden

Benefits

- Increases visibility of pedestrians waiting to cross and in the crossing.

Constraints

- Potential to restrict and/or clutter sidewalk environment near the crosswalk.

Typical Applications

- Crossings or areas with high levels of nighttime pedestrian activity (e.g., greater than 20 pedestrians per hour).
- Locations with a high frequency of nighttime pedestrian crashes.
- Could also be considered for crossings with lower pedestrian volume activity if crossing conflict is severe or unexpected (e.g., pedestrian crossing location across a higher speed roadway).

Design Considerations

- Illumination could be used to contribute to the identity of a district or neighborhood and serve as a unifying element in the streetscape.
- Lighting should be scaled to the street and land use contexts to avoid light pollution/trespass and ensure a comfortable illumination quality for users.

Additional Guidance

- *California Manual on Uniform Traffic Control Devices*

[15] Cost includes materials and labor per light.

Pedestrian Safety Solutions Toolbox

Marked Uncontrolled Crosswalks at Two-Way Stop-Controlled Locations

REDUCE CORNER RADII

Magnitude Cost: $15,000 - $60,000 (per corner)[16]

Reduces right-turning vehicle speeds at an intersection by forcing sharper turns. Reduced corner radii also shorten crossing distances for pedestrians.

Benefits

- Reduces right-turning vehicle speeds at the intersection.
- Reduces pedestrian exposure by reducing crossing distance.

Constraints

- Potential drainage changes needed in some retrofits.
- Less effective at reducing speeds before and after turns.

Typical Applications

- Intersections with average right-turn speeds above 15 miles per hour and where pedestrian volumes are greater than 20 pedestrians per hour.
- Intersections with a documented crash history of right-turning vehicle and pedestrian conflicts.

Design Considerations

- Corner curb radii should accommodate the roadway type's design vehicle turning movements.
- A smaller curb radius expands the pedestrian area and allows for better pedestrian ramp/crosswalk alignment.
- Minimize effective turning radius where possible.
- Consider existing drainage infrastructure needs for modifications.

Additional Guidance

- *California Manual for Uniform Traffic Control Devices*
- NACTO *Urban Street Design Guide*

[16] Cost range depends on site conditions such as the need to relocate drainage or utilities as well as the need for surveying and/or design.

Pedestrian Safety Solutions Toolbox

Marked Uncontrolled Crosswalks at Midblock Locations

INSTALL PEDESTRIAN SIGNAL

Magnitude Cost: $225,000 (per installation)

Provides pedestrians with a signal-controlled crossing at a mid-block location or at a previously stop-controlled intersection where pedestrian volumes warrant full signalization. The signal remains green for the mainline traffic movement until actuated by a push button to call a red signal for traffic.

Beaverton, OR

Tucson, AZ

Benefits

- Has nearly 100 percent rate of motorist yielding behavior at crossing locations.
- Same appearance as standard traffic signal, so motorist understanding is high.

Constraints

- Must be activated by pedestrians.
- More costly than other crossing treatments.

Typical Applications

- Locations meeting traffic signal warrants for pedestrians as defined in the California MUTCD (Part 4).
- Locations where there are conflict or crash patterns between vehicle-pedestrians.
- Typical applications include:
  - Locations with four or more lanes and vehicle volumes greater than 15,000 per day
  - Locations with pedestrian volumes greater than 20 per hour and speed limits greater than 35 mph
  - At locations where multi-use paths intersect with roadways.

Design Considerations

- The push button to activate the pedestrian signal should be easily accessible by pedestrians, wheelchair users, and bicyclists (if applicable).

Additional Guidance

- *California Manual on Traffic Control Devices*
- NACTO *Urban Street Design Guide*
- *NCHRP Report 562 Improving Pedestrian Safety at Unsignalized Crossings*

Pedestrian Safety Solutions Toolbox

Marked Uncontrolled Crosswalks at Midblock Locations

INSTALL PEDESTRIAN HYBRID BEACON (PHB)

Magnitude Cost: $150,000 (per installation)[17]

Boise, ID

A pedestrian hybrid beacon is a pedestrian activated display that is unlit when not in use. It begins with a yellow light alerting drivers to slow, and then displays a solid red light requiring drivers to remain stopped while pedestrians cross the street. Finally, the beacon shifts to flashing red lights to indicate motorists may proceed after pedestrians have completed their crossing.

Benefits

- Higher rates of motorists yielding than crosswalks without PHB.
- Reduces pedestrian-involved crashes.
- Less delay to motor vehicle drivers than a signal.

Constraints

- Must be activated by pedestrians.
- More costly than other crossing treatments.
- Initially, may be unfamiliar to motorists.

Typical Applications

- Conditions consistent with the California MUTCD guidance.
- Typical locations include:
  - Locations with four or more lanes and vehicle volumes greater than 15,000 per day
  - Locations with pedestrian volumes greater than 20 per hour and speed limits greater than 35 mph
  - At locations where multi-use paths intersect with roadways.

Design Considerations

- The push button to activate the pedestrian hybrid beacon should be easily accessible by all users.

Additional Guidance

- *California Manual on Uniform Traffic Control Devices*
- NACTO *Urban Street Design Guide*
- *NCHRP Report 562 Improving Pedestrian Safety at Unsignalized Crossings*

[17] Cost includes design, materials, and installation.

Pedestrian Safety Solutions Toolbox

Marked Uncontrolled Crosswalks at Midblock Locations

INSTALL RECTANGULAR RAPID FLASHING BEACON (RRFB)

Magnitude Cost: $30,000 (per installation)


Portland, OR


Beaverton, OR

These crossing treatments include signs that have a pedestrian-activated "strobe-light" flashing pattern to attract motorists' attention and provide awareness of pedestrians and/or bicyclists that are intending to cross the roadway.

Benefits

- Provides a visible warning to motorists at eye level.
- Increases motorists yielding behavior at crossing locations over round yellow flashing beacons (80 to 100 percent compliance).
- Allows motorists to proceed after yielding to pedestrians.

Constraints

- Flashing beacons must be activated by pedestrians.
- Motorists may not understand the flashing lights of the RRFB, so compliance may be lower than with a traffic signal.

Typical Applications

- Midblock crossings with pedestrian volumes of 20 or more pedestrians per hour and documented midblock crossing pedestrian collisions.
- Locations with:
  - three or more lanes and posted speeds of 30 mph or higher without a raised median.
  - three or more lanes and posted speeds of 40 mph with or without a raised median
- Locations where multi-use paths intersect with roadways.

Design Considerations

- The push button should be easily accessible by pedestrians, wheelchair users, and bicyclists (if applicable).
- Consider adding a push button in the median island for crossings of multi-lane facilities.
- Automated pedestrian detection may also be installed; it would increase cost of installation.

Additional Guidance

- *California Manual on Uniform Traffic Control Devices*
- NCHRP *Report 562 Improving Pedestrian Safety at Unsignalized Crossings*

Pedestrian Safety Solutions Toolbox

Marked Uncontrolled Crosswalks at Midblock Locations

INSTALL CROSSING ISLAND (PEDESTRIAN REFUGE)

Magnitude Cost: $15,000 – $25,000 (per crossing island)[18]

Portland, OR

Portland, OR

Provides a raised refuge area in between opposing travel streams for pedestrians to stop while crossing the street. They can be used at intersections or mid-block crossings.

Benefits

- Reduces pedestrian exposure at marked and unmarked crosswalks.
- Requires shorter gaps in traffic to cross the street by allowing pedestrians to cross in two phases.
- Can help reduce vehicle speeds.

Constraints

- Streets with constrained right-of-way may not have sufficient width to allow for a crossing island.

Typical Applications

- Four or more lane roadways without a raised median where:
  - Posted speeds are 30 mph or less and vehicular ADT is between 9,000 and 12,000 per day.
  - Posted speeds are 35 mph and vehicular ADT is 9,000 per day or less.
- Often used in areas with high levels of vulnerable pedestrian users, such as near schools or senior centers/housing, or a demonstrated pedestrian crash history.

Design Considerations

- Must have at least 6 feet of clear width to accommodate people using wheelchairs.
- At crossing locations where bicyclists are anticipated, a width of 10 feet or greater is desirable to accommodate bicycles with trailers or groups of bicyclists.
- Can be applied in conjunction with other treatments.

Additional Guidance

- *California Manual for Uniform Traffic Control Devices*
- NACTO *Urban Streets Design Guide*
- *NCHRP Report 562 Improving Pedestrian Safety at Unsignalized Crossings*

[18] Cost range varies from installation alone at the low end to design and installation at the high end.

Pedestrian Safety Solutions Toolbox

Marked Uncontrolled Crosswalks at Midblock Locations

INSTALL CURB EXTENSIONS

Magnitude Cost: $15,000 (per extension)[19]

An extension of the curb or the sidewalk into the street, usually at an intersection, that narrows the vehicle path, inhibits fast turns, and shortens the crossing distance for pedestrians.


Boston, MA


Bend, OR

Benefits

- Shortens crossing distances for pedestrians.
- Reduces motorist turning speeds.
- Increases visibility between motorists and pedestrians.
- Enables permanent parking
- Enables tree and landscape planting and water runoff treatment.

Constraints

- More easily implemented on streets with on-street parking.
- Physical barrier can be exposed to traffic.
- Greater cost and time to install than standard crosswalks.
- Can present turning radius problems to large vehicles.

Typical Applications

- Mid-block or intersection pedestrian crossings on streets with unrestricted on-street parking.
- Crossing locations with pedestrian collision history.
- Streets with on-street parking where:
  - pedestrian volumes ≥ 20 pedestrians per hour;
  - ADT ≥ 1,500 vehicles per day; and,
  - average right-turn speeds ≥ 15 mph.

Design Considerations

- Include a passage for bicycles to prevent conflicts with vehicles.
- Provide accessible curb ramps and detectible warnings.
- Include landscaping on the curb extension to differentiate the pedestrian travel path.

Additional Guidance

- *California Manual for Uniform Traffic Control Devices*
- ITE/FHWA *Traffic Calming: State of the Practice*
- FHWA *Designing Sidewalks and Trails for Access Part II*

[19] Costs will vary based on the length and drainage requirements.

Pedestrian Safety Solutions Toolbox

Marked Uncontrolled Crosswalks at Midblock Locations

INSTALL RAISED PEDESTRIAN CROSSING

Magnitude Cost: $10,000 – $50,000 (per crossing)[20]


Atlanta, GA


Orlando, FL


Sanford, FL

Raised pedestrian crossings bring the level of the roadway even with the sidewalk, providing a level pedestrian path and requiring vehicles to slow. Raised crossings can be used at midblock crosswalks or intersections.

Benefits

- Increases visibility for pedestrians and motorists
- Slows motorists.

Constraints

- Can be difficult to navigate for large trucks, snow plows, and low ground clearance vehicles.

Typical Applications

- Raised crosswalks are typically provided at midblock crossings on two-lane roads where pedestrian volumes ≥ 50 pedestrians per hour and speed control is needed and there is a document history of pedestrian crossing-related collisions.
- Raised crosswalks may be provided at intersections where low-volume streets intersect with high-volume streets or where a roadway context changes (e.g. commercial to residential).

Design Considerations

- Raised crosswalks should be even with the sidewalk in height and at least as wide as the crossing or intersection.
- Provide detectable warnings for pedestrians where they cross from the sidewalk into the crossing area.
- Consider drainage needs and provide appropriate treatments.
- Use colored asphalt as opposed to brick or decorative surface materials to make the crossing smoother for those with mobility impairments.
- Raised crosswalks should not be used on transit routes or where there are steep grades or curves.

Additional Guidance

- *California Manual for Uniform Traffic Control Devices*
- FHWA Designing Sidewalks and Trails for Access *Part II of II: Best Practices Design Guide*
- NACTO *Urban Street Design Guide*

[20] The cost range varies from inclusion as part of a larger project to the design and installation as a standalone project.

Pedestrian Safety Solutions Toolbox

Marked Uncontrolled Crosswalks at Midblock Locations

INSTALL HIGH VISIBILITY CROSSWALK

Magnitude Cost: $2,500 (per crossing)[21]

Mount Rainier, MD

High visibility crosswalks consist of reflective roadway markings and accompanying signage at intersections and priority pedestrian crossing locations.

Benefits

- Communicates potential for pedestrian crossings to motorists.
- Designates a preferred crossing location for pedestrians.
- Increases motorists' awareness of crossing pedestrians.

Constraints

- Can be more effective with other types of traffic control (signals, stop signs)[22].
- Motorist compliance is lower than other midblock treatments.

Typical Applications

- Locations near schools, parks, hospitals, senior centers, or other pedestrian generators
- Peak hour pedestrian volumes are higher than 40 per hour and vehicle ADT is greater than 1,500 per day.
- Location is 300 feet or more from another crossing with documented history of pedestrian crossing collisions.

Design Considerations

- Striping can vary (continental, triple four, ladder, zebra, etc.)
- Minimum width is 6 feet, but wider crossings are preferred in areas with high number of pedestrians.
- Striped crosswalks alone should not be used where:
  - the speed limit exceeds 40 mph
  - the ADT is 12,000 or greater and there are four or more lanes without a raised median or crossing island
  - the ADT is 15,000 or greater and there are four or more lanes with a raised median or crossing island
- Ensure sufficient sight distance for vehicles and pedestrians
- In school zones, yellow striping should be used.

Additional Guidance

- *NCHRP Report 562: Improving Pedestrian Safety at Unsignalized Crossings*
- *California Manual on Uniform Traffic Control Devices*

[21] Cost based on design, paint, and installation.
[22] Fitzpatrick, K. et al, *NCHRP Report 562: Improving Pedestrian Safety at Unsignalized Crossings* (2006).

Pedestrian Safety Solutions Toolbox

Marked Uncontrolled Crosswalks at Midblock Locations

IMPLEMENT A ROAD DIET OR ROAD RECONFIGURATION

Magnitude Cost: $30,000 - $150,000 (per mile)[23]

In a road diet project, a street's roadway space is reconfigured or restriped to reduce the number of vehicle lanes to prioritize speeds consistent with a pedestrian- and bicycle-oriented environment.

Orlando, FL

Oakland, CA

Benefits

- Decreases vehicle speeds
- Increases driver awareness of bicyclists and pedestrians
- Reallocates space for pedestrians and bicyclists
- Improves comfort level for pedestrians and bicyclists.

Constraints

- Can be more effective with other types of traffic control (signals, stop signs).
- At uncontrolled locations (midblock), motorist compliance is not as high as with other treatments.

Typical Applications

- Four or five lane undivided roadways with vehicular ADT of 20,000 or less, or peak hour directional volumes of 875 or less.
- Locations with a documented history of left-turning or speed-related collisions or conflicts with pedestrians.

Design Considerations

- Lane reconfiguration/road diet projects should have a traffic analysis conducted prior to implementation.
- The reconfiguration of the roadway space should be context sensitive, taking into account the operations, user needs, and land use context of the roadway.

Additional Guidance

- *NCHRP Report 562: Improving Pedestrian Safety at Unsignalized Crossings*
- *California Manual on Uniform Traffic Control Devices*
- NACTO *Urban Street Design Guide*

[23] Cost range covers the range from design and restriping only to more complicated projects involving planning, outreach, and more complex design.

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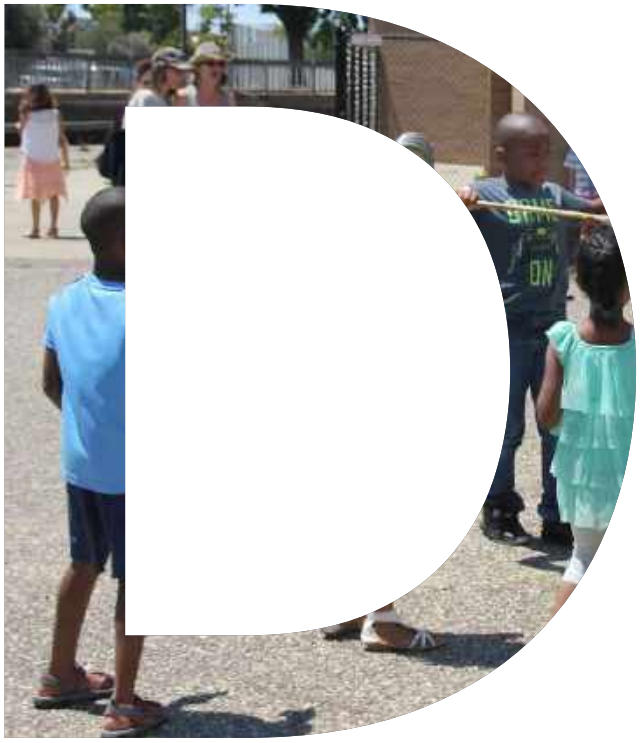
Appendix D

Oakland Walks! 2017 Pedestrian Plan Update



Appendix D
Street Trees

Recommended Street Tree Species List for Oakland[1]

The City maintains a list of tree species that are approved for planting as streets trees. Species are approved based on factors such as water consumption, tendency to heave sidewalks and maintenance needs.

No.	Botanical Name	Common Name	Size
1	Acer buergerianum	Trident Maple	S
2	Cercis canadensis	Eastern Redbud	S
3	Chionanthus retusus	Chinese Fringe Tree	S
4	Heteromeles arbutifolia	Toyon	S
5	Lagerstroemia indica x L. fauriei 'Muskogee', 'Natchez', 'Tuscarora'	Hybrid Crape Myrtle	S
6	Magnolia grandiflora 'Little Gem' or 'Saint Mary'	Southern Magnolia (small varieties)	S
7	Photinia x fraseri	Fraser Photonia	S
8	Prunus cerasifera 'Krauter Vesuvius', 'Newport'	Purple Leaf Plum	S
9	Prunus x blireana	Double Pink Flowering Plum	S
10	Pyrus kawakamii	Evergreen Pear	S
11	Rhus lancea	African Sumac	S
12	Tristania laurina (Tristaniopsis laurina)	Water Gun	S
13	Acer campestre 'Evelyn' or 'Queen Elizabeth'	Hedge Maple	M
14	Aesculus carnea 'Briotii'	Red Hosechestnut	M
15	Albizia julibrissin	Silk Tree, Mimosa Tree	M
16	Carpinus betulus 'Fastigiata' or 'Frans Fontaine'	European Hornbeam	M
17	Fraxinus dipetala	Foothill Ash	M
18	Geijera parviflora	Australian Willow	M
19	Koelreuteria bipinnata	Chinese Flame Tree	M
20	Koelreuteria paniculata	Goldenrain Tree	M
21	Laurus nobilis 'Saratoga'	Saratoga Laurel	M
22	Melaleuca linariifolia	Flaxleaf Paperbark	M
23	Melaleuca quinquenervia (M. viridiflora var. rubriflora)	Cajeput Tree	M
24	Metrosideros excelsus	New Zealand Christmas Tree	M
25	Parrotia persica	Persian Parrotia	M
26	Pyrus calleryana 'Aristocrat'	Aristocrat Pear	M
27	Sapium sebiferum (Triadica sebifera)	Chinese Tallow Tree	M
28	Ulmus propinqua 'Emerald Suns	Emerald Sunshine Elm	M
29	Acer negundo 'Sensation'	Sensation Box Elder	L
30	Acer rubrum 'Armstrong', 'Armstrong Gold', 'Brandywine' or 'October Glory'	Red Maple	L
31	Acer saccharum nigrum	Black Maple	L
32	Acer x freemanii 'Jeffersred'	Autumn Blaze Maple	L
33	Arbutus 'Marina'	Hybrid Madrone, Strawberry Tree	L
34	x Chitalpa tashkentensis	Chitalpa	L
35	Fraxinus oxycarpa (angustifolia) 'Raywood'	Raywood Ash	L
36	Ginkgo biloba 'Fairmont', 'Princeton Sentry', or 'Saratoga'	Maidenhair Tree	L
37	Gleditsia triacanthos inermis 'Shademaster' or 'Skyline'	Thornless Honey Locust	L

[1]City of Oakland -Master Street Tree List, April 2017 - April 2018
http://www2.oaklandnet.com/oakca1/groups/pwa/documents/report/oak042662.pdf

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Recommended Street Tree Species List for Oakland (continued)[1]

The City maintains a list of tree species that are approved for planting as streets trees. Species are approved based on factors such as water consumption, tendency to heave sidewalks and maintenance needs.

No.	Botanical Name	Common Name	Size
38	Gymnocladus dioica 'Espresso'	Kentucky Coffee Tree	L
39	Lophostemon confertus (Tristania conferta)	Brisbane Box	L
40	Lyonothamnus floribundus asplenifolius	Catalina Ironwood	L
41	Magnolia grandiflora 'D.D. Blanchard', 'Majestic Beauty', 'Samuel Sommer', or any unspecified variety	Southern Magnolia (large varieties)	L
42	Nyssa sylvatica	Sour Gum or Tupelo	L
43	Pistacia chinensis 'Keith Davey' or 'Pearl Street'	Chinese Pistache	L
44	Quercus agrifolia	Coast Live Oak	L
45	Quercus douglasii	Blue Oak	L
46	Quercus ilex	Holly Oak	L
47	Quercus macrocarpa	Bur Oak	L
48	Quercus shumardii	Shumard Red Oak	L
49	Quercus suber	Cork Oak	L
50	Robinia pseudoacacia 'Bessoniana'	Bessoniana Black Locust	L
51	Robinia x ambigua 'Purple Robe'	Purple Flowering Locust	L
52	Tilia tomentosa	Silver Linden	L
53	Ulmus 'Frontier'	Frontier Hybrid Elm	L
54	Fraxinus americana 'Autumn Purple' or 'Empire'	American Ash	XL
55	Platanus x hispanica (acerifolia) 'Columbia'	London Plane	XL
56	Podocarpus gracilior (Afrocarpus falcatus)	African Fern Pine	XL
57	Quercus coccinea	Scarlet Oak	XL
58	Quercus palustris	Pin Oak	XL
59	Ulmus americana 'Jefferson', 'New Harmony', or 'Princeton'	American Elm	XL

Oakland Public Library, 2016

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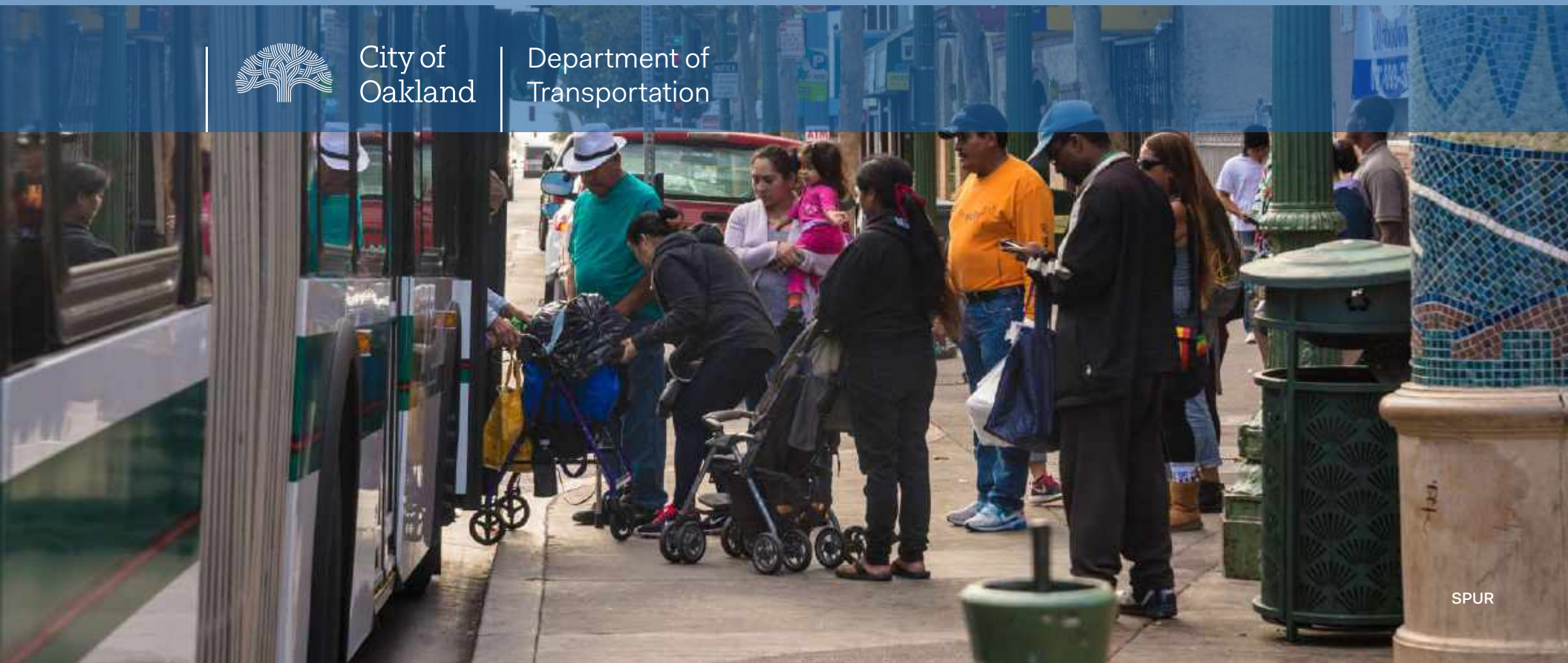
Appendix E

Oakland Walks! 2017 Pedestrian Plan Update



Appendix E

Oakland Public Schools in Safe Routes to School (SRTS)

Oakland public schools in Safe Routes to Schools (SRTS) program (2015 - 2016)

Achieve Academy
Alliance Academy
ASCEND
Bella Vista Elementary
Bret Harte Middle
Bridges Academy
Castlemont High School
Community United Elementary
East Oakland PRIDE Elementary
Edna Brewer Middle School
Emerson Elementary
EnCompass Academy
Esperanza Elementary
Garfield Elementary
Glenview Elementary
Global Family Elementary School
International Community Elementary
Fred Korematsu Discovery Academy
Learning Without Limits
Lincoln Elementary School
Manzanita Community School
Manzanita Seed Elementary
Markham Elementary
Martin Luther King Jr., Elementary
McClymonds High
Montclair Elementary
New Highland Academy
Oakland International High School
Oakland School for the Arts
Oakland Technical High
Peralta Elementary
Place@Prescott
Reach Academy
Redwood Heights Elementary
RISE Community School
Sankofa Academy
Think College Now
United For Success Academy
Westlake Middle
Yu Ming Charter School

Oakland Public Library, 2013

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Appendix F

Oakland Walks! 2017 Pedestrian Plan Update

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Sergio Ruiz, SPUR

Appendix F
Pedestrian Plan Survey Questions

Survey Questions

Help us make walking in Oakland safer and more convenient!

Survey Questions

1. If you live in Oakland, what is your five digit ZIP code? (Skip the question if you don't know it or don't live in Oakland.)

No.	Response Date	Response
1	4/8/2016 17:43	94606
2	3/26/2016 19:04	94612
3	2/10/2016 6:07	94611
4	12/2/2015 1:40	94608
5	12/1/2015 6:08	94609
6	11/27/2015 7:37	94611
7	11/19/2015 19:25	94608
8	11/19/2015 18:24	94608
9	11/17/2015 0:18	94608
10	11/15/2015 1:26	94609
11	11/12/2015 19:39	94606
12	11/10/2015 1:01	94607
13	11/7/2015 22:04	94609
14	11/6/2015 18:49	94609
15	10/26/2015 23:11	94609
16	10/25/2015 4:12	94609
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22	9/18/2015 22:59	94608
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24	9/18/2015 22:20	94609
25	9/18/2015 21:36	94608
26	9/18/2015 19:18	94608
27	9/13/2015 8:58	94605
28	8/28/2015 21:20	94608
29	8/26/2015 13:16	94621
30	8/21/2015 0:15	94610
31	8/20/2015 21:36	94609
32	8/19/2015 23:44	94607
33	8/15/2015 21:03	94610
34	8/11/2015 20:15	94618
35	8/10/2015 20:38	94605
36	8/8/2015 18:38	94607
37	8/8/2015 5:32	94619
38	8/8/2015 2:21	94603
39	8/6/2015 20:32	94611
40	8/5/2015 18:06	94602
41	8/5/2015 5:02	94606
42	8/5/2015 3:09	94612
43	8/4/2015 23:25	94608
44	8/4/2015 19:34	94610
45	8/4/2015 5:44	94608
46	8/4/2015 4:08	94607
47	8/4/2015 3:54	94610
48	8/3/2015 20:39	94609
49	8/3/2015 19:18	94612
50	8/3/2015 18:43	94611
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52	8/3/2015 15:08	94607
53	8/3/2015 4:04	94605
54	8/3/2015 0:03	94611
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56	8/2/2015 1:18	94618
57	8/1/2015 15:34	94618
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63	7/29/2015 14:48	94611
64	7/29/2015 7:58	94605
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66	7/28/2015 22:14	94601
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70	7/28/2015 15:55	94608
71	7/28/2015 12:34	94608
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82	7/27/2015 19:12	94612
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84	7/27/2015 10:42	94605
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93	7/25/2015 22:01	94605
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95	7/25/2015 16:24	94608
96	7/25/2015 16:23	94605
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98	7/25/2015 13:40	94605
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102	7/25/2015 4:48	94605
103	7/25/2015 4:47	94605
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107	7/25/2015 2:19	94605
108	7/25/2015 1:51	94605
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111	7/24/2015 17:20	94608
112	7/24/2015 5:49	95605
113	7/24/2015 1:13	94609
114	7/24/2015 0:41	94608
115	7/23/2015 18:26	94619
116	7/23/2015 14:55	94601

1. If you live in Oakland, what is your five digit ZIP code? (Skip the question if you don't know it or don't live in Oakland.)

No.	Response Date	Response
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157	7/18/2015 17:01	94608
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162	7/18/2015 14:30	94609
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166	7/18/2015 12:24	94609
167	7/18/2015 11:16	94609
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175	7/18/2015 0:11	94609
176	7/17/2015 23:16	94608
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186	7/17/2015 22:09	94618
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189	7/17/2015 20:50	94609
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191	7/17/2015 20:15	94609
192	7/17/2015 19:56	94609
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196	7/17/2015 17:27	94618
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198	7/17/2015 16:55	94608
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206	7/17/2015 14:11	94608
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208	7/17/2015 13:40	94609
209	7/17/2015 6:48	94618
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225	7/17/2015 0:43	94608
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241	7/16/2015 23:10	94611
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243	7/16/2015 22:59	94606
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245	7/16/2015 22:48	94609
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247	7/16/2015 22:38	94618
248	7/16/2015 22:26	94618
249	7/16/2015 22:21	94609
250	7/16/2015 22:09	94611
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252	7/16/2015 22:03	94618
253	7/16/2015 21:59	94618
254	7/16/2015 21:52	94609
255	7/16/2015 21:45	94609
256	7/16/2015 21:44	94618

1. If you live in Oakland, what is your five digit ZIP code? (Skip the question if you don't know it or don't live in Oakland.)

No.	Response Date	Response
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263	7/16/2015 20:00	94610
264	7/16/2015 19:32	94602
265	7/16/2015 18:16	94618
266	7/16/2015 17:34	94618
267	7/16/2015 17:13	94612
268	7/16/2015 17:10	94618
269	7/16/2015 16:43	94609
270	7/16/2015 16:29	94609
271	7/16/2015 16:27	94608
272	7/16/2015 14:30	94618
273	7/16/2015 14:25	94609
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276	7/16/2015 6:24	94608
277	7/16/2015 6:18	94618
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281	7/16/2015 5:13	94618
282	7/16/2015 5:10	95609
283	7/16/2015 5:08	94618
284	7/16/2015 5:03	94608
285	7/16/2015 4:52	94609
286	7/16/2015 4:44	94602
287	7/16/2015 4:39	94609
288	7/16/2015 4:28	94608
289	7/16/2015 2:59	94603
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291	7/16/2015 2:33	94607
292	7/16/2015 1:37	94608
293	7/16/2015 1:21	94610
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363	7/14/2015 16:16	94610
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395	7/13/2015 22:05	94619
396	7/13/2015 21:55	94608

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No.	Response Date	Response
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406	7/13/2015 18:45	94619
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409	7/13/2015 17:59	94606
410	7/13/2015 17:48	94608
411	7/13/2015 9:01	94606
412	7/13/2015 4:05	94618
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441	7/9/2015 3:34	94609
442	7/9/2015 3:33	94607
443	7/9/2015 3:23	94607
444	7/9/2015 3:14	94605
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520	7/1/2015 8:19	94609
521	7/1/2015 7:16	94609
522	7/1/2015 5:28	94611
523	7/1/2015 1:03	94611
524	7/1/2015 0:25	94618
525	7/1/2015 0:15	94609
526	6/30/2015 23:57	94606
527	6/30/2015 23:39	94609
528	6/30/2015 23:34	94609
529	6/30/2015 23:31	94618
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531	6/30/2015 23:27	94609
532	6/30/2015 23:26	94612
533	6/29/2015 4:32	94618
534	6/26/2015 0:22	94610

2. If you work in Oakland, what is the five digit ZIP code of your primary work location? (Skip the question if you don't know it or don't work in Oakland.)

No.	Response Date	Response
1	4/8/2016 17:43	94612
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9	11/6/2015 18:49	94609
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21	8/4/2015 4:08	94607
22	8/4/2015 4:01	94602
23	8/3/2015 20:39	94612
24	8/3/2015 18:43	94612
25	8/3/2015 18:36	94607
26	8/3/2015 18:32	94612
27	8/2/2015 21:10	94612
28	8/1/2015 15:34	94618
29	7/29/2015 20:11	94605
30	7/29/2015 17:12	94605
31	7/29/2015 14:48	94611
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35	7/28/2015 17:19	94612
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37	7/28/2015 4:24	94608
38	7/28/2015 2:36	94610
39	7/27/2015 22:27	94607
40	7/27/2015 22:01	94607
41	7/27/2015 21:53	94610
42	7/27/2015 5:41	94621
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44	7/25/2015 4:47	94605
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46	7/25/2015 1:41	94605
47	7/24/2015 1:13	4607
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58	7/20/2015 16:41	94105
59	7/20/2015 14:34	94610
60	7/18/2015 20:09	94609
61	7/18/2015 19:35	94609
62	7/18/2015 17:01	94606
63	7/18/2015 15:40	94607
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139	7/14/2015 2:46	94105
140	7/14/2015 1:46	94609

2. If you work in Oakland, what is the five digit ZIP code of your primary work location?
(Skip the question if you don't know it or don't work in Oakland.)

No.	Response Date	Response
141	7/14/2015 1:38	94608
142	7/14/2015 1:09	94612
143	7/14/2015 1:06	94612
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186	7/7/2015 21:20	94612
187	7/7/2015 20:30	94607
188	7/7/2015 18:38	94612
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191	7/7/2015 18:04	94612
192	7/7/2015 18:02	94612
193	7/7/2015 17:34	94609
194	7/7/2015 5:10	94618
195	7/7/2015 3:35	94618
196	7/7/2015 3:22	94618
197	7/6/2015 23:55	94618
198	7/6/2015 21:53	94607
199	7/6/2015 14:10	94607
200	7/5/2015 21:15	94612
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202	7/2/2015 17:31	94612
203	7/2/2015 17:09	94607
204	7/1/2015 5:28	94705
205	7/1/2015 2:53	94712
206	6/30/2015 23:57	94606
207	6/30/2015 23:50	94607
208	6/30/2015 23:34	94607

3. How often do you walk in Oakland?

Answer Options	Every day	A few times a week	A few times a month	A few times a year	Never
To go to work					
To get to transit					
To go to school					
To shop or run errands					
For social purposes (visit friends, eat out, etc.)					
For exercise					
For fun or recreation					

4. If you walk in Oakland, what do you MOST enjoy about it?

5. If you walk in Oakland, what do you LEAST enjoy about it?

6. Below is a list of potential barriers to walking. In your opinion, how much do they discourage people from walking in Oakland?

7. If you were in charge of Oakland's Pedestrian Program, what would you do to make walking in Oakland easier, safer or more pleasant? To submit your ideas or suggestions for specific blocks, intersections or other locations, please use the 2017 Pedestrian Plan's online mapping tool.

Answer Options	A lot	Some what	Not too much
Speeding or aggressive/distracted driving			
Poor lighting (for walking at night)			
Missing or broken sidewalks			
Few or no pedestrian amenities (benches, street trees, bus shelters, etc.)			
Crosswalks do not exist or are too far apart			
Streets are too wide and feel unsafe to cross			
No destinations to walk to, or destinations are too far away			
Time to cross at traffic lights is too short			
Missing curb ramps (i.e., mini-ramps that lead down from the sidewalk to the street at intersections and crosswalks)			
Steep hills			

8. Increase enforcement of failure to stop and/or speeding laws among drivers

- Yes, the streets feel unsafe because drivers speed or don't stop at crosswalks
- Yes, but also target cyclists and pedestrians who break traffic laws
- No, traffic safety generally isn't a problem in Oakland
- No, there are more important laws to enforce
- I'm not sure how I feel about this

9. Ticket parked cars that block the sidewalk more often

- Yes, blocking the sidewalk is inconsiderate and dangerous
- Yes, but ony if it's near a school, so that kids can walk to school safely
- No, parking on my street is very difficult because the street is narrow or there aren't enough spaces
- No, the Police Department has more important things to do
- I'm not sure how I feel about this

10. Do you own a retail, service or restaurant business in Oakland? (Y/N)

11. What type of retail business is it?
    - Retail
    - Service
    - Restaurant
    - Other (specify below)

12. Below is a list of factors that you might use to choose where to locate your business. How much did each factor contribute to where you located your business?

Answer Options	A lot	Some what	Not too much	A few times a year	Never
Many people walking past					
Many parking spaces for cars					
Many racks for bike parking					
High amount of perceived safety					
Well-lit surroundings					
Location of similar businesses nearby					
Wide sidewalk					
Other (specify below)					

13. From the list below, rank the five types of projects that are most important to you.

Answer Options	Most important	2nd	3rd	4th	5th
Measures that slow traffic on large streets (e.g. International Blvd., Telegraph Ave.)					
New or improved street lights (for night time visibility)					
Measures that slow traffic on residential streets					
Street trees, plantings and landscaping					
Increased maintenance and repair of existing sidewalks					
More crosswalks and/or more visible crosswalks					
Adding missing sidewalks					
Traffic signals that count down remaining crossing time for pedestrians					
Adding missing curb ramps					
Pedestrian amenities (benches, bus shelters, signs and maps highlighting pedestrian destinations)					
Improvements to trails and mid¬block paths and stairs (maintenance, lighting, handrails)					

14. Are there other types of physical projects that should be included in the 2017 Pedestrian Plan? Why?

Answer Options	Most important	2nd	3rd	4th	5th
Street fairs and other events which create open streets for pedestrians					
Campaigns against unsafe or distracted driving					
Lower speed limits					
Removal of parking near intersections with poor sightlines or blind spots					
Activities to promote and encourage walking to school					
More crossing time for pedestrians at traffic signals					
Restrictions on turning right when the light is red					

15. Are there any types of physical projects that should NOT be included in the 2017 Pedestrian Plan? Why not?

16. From the list below, rank the five programs or policy changes that are most important to you

17. Are there other types of programs or policy changes that should be included in the 2017 Pedestrian Plan? Why?

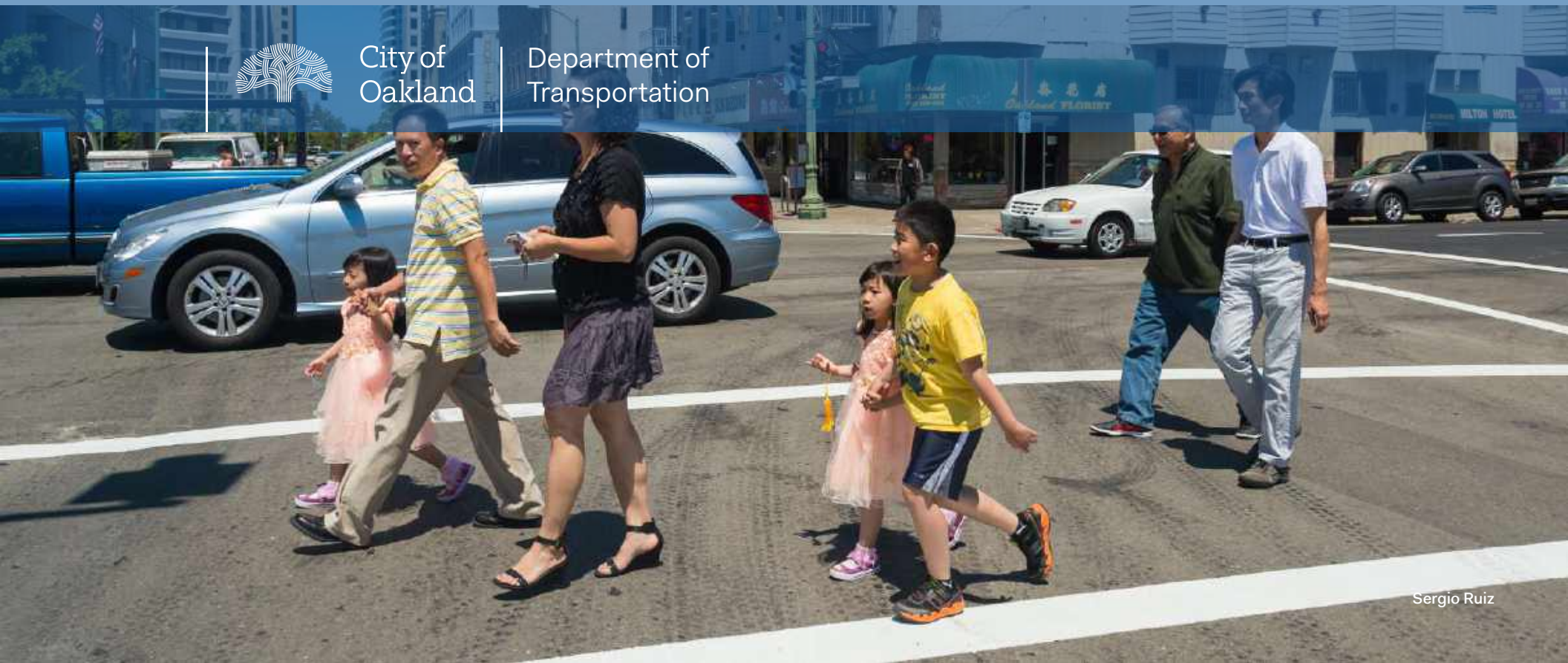
18. Are there any other types of programs or policy changes that should NOT be included? If so, why not

19. Use the space below to submit any additional ideas or comments you have regarding Oakland's Pedestrian Master

City of Oakland
Department of Transportation

Appendix G

Oakland Walks! 2017 Pedestrian Plan Update



Appendix G
Additional Resources

Additional Resources:

ADA Transition Plans:

http://www2.oaklandnet.com/government/o/PWA/o/EC/s/ADA/DOWD005072

OakDOT GIS Dashboard:

http://oakbec.s3.amazonaws.com/MapLanding/maps/DOTDashboard.html

City of Oakland 2002 Pedestrian Master Plan:

http://www2.oaklandnet.com/oakca1/groups/pwa/documents/report/oak025012.pdf

Oakland Pedestrian Counts Map:

http://www.oaklandbikemaps.info/counts/

Oakland's Adopt-A-Spot Program:

http://www2.oaklandnet.com/government/o/PWA/o/FE/s/ID/OAK024735#Adopt a Spot

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