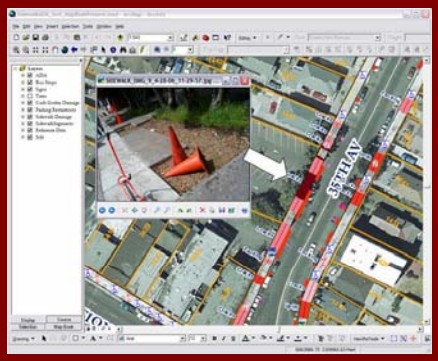
Final Report

CITY OF OAKLAND, CALIFORNIA

Citywide Sidewalk Condition and ADA Survey

July 2007



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Executive Summary

Introduction:

The City of Oakland has more than 400,000 citizens residing in 79.8 square miles of land area. There are more than 100,000 individual public and privately owned parcels within the city limits. Oakland continues to experience a significant residential growth, with numerous housing developments under construction in many locations adjacent to the 836 miles of street centerlines. Oakland residents and visitors regularly utilize hundreds of miles of sidewalks associated with the city street network. The condition of these city sidewalks are at the center of this unique inventory.

City officials decided that a comprehensive planning/engineering study needed to be done to quantify the amount of actual sidewalk damage, and to substantiate the cost-to-repair figure. In addition to the sidewalk damage problems, there are equally important concerns regarding the City's compliance with the Americans with Disabilities Act (ADA). Therefore, in April 2004, the City Public Works Agency prepared and released for competition a "Request for Proposals" for a Citywide Sidewalk Condition/ADA Inventory.

Scope of Services:

The scope, in short, was to conduct a Citywide inventory of sidewalk assets. Data was to be collected and stored in a GIS (Geographic Information System) format compatible with The City of Oakland's current GIS system. The final inventory list would include the development of seven different feature layers for collection. Those features include:

Sidewalk Damage

Trees and Tree Wells

ADA Barriers (other than sidewalk damage and trees)

Parking Restrictions (Curb Markings)

Curb / Gutter Damage

Signs

Bus Stops

The project was developed, and programmed as a Citywide Sidewalk Survey Project, therefore all data collected is associated with City sidewalks. The actual physical parameters of the collection are from the curb and gutter to back of the sidewalk. Signs and trees that are located behind sidewalks, in street median strips, or exist where no sidewalk is present, are NOT a part of this inventory.

Summary of Findings:

This inventory contains a robust set of data collected over a one-year period. The full field collection was completed on November 10, 2006, with the final QA/QC completion on December 20, 2006.

The data collected citywide can be summarized as follows:

Feature Count Breakdown Citywide		
Feature Class	**Locations**	**Percent of Total**
Sidewalk Damage	110,715	33%
Trees & Tree Wells	42,661	13%
Parking Restrictions	35,174	10%
ADA Barriers	53,999	16%
Curb Gutter Damage	50,550	15%
Signs & Markings	45,475	13%
Bus Stops	1,665	0%
Total Count of Collected Features	**340,239**	**100%**

Sidewalk Damage - The sidewalk inventory captured by survey is 1,126 miles. The citywide inventory for Sidewalk Damage found that there are approximately **110,715** damage records. Of the 44,712,621 total square feet of sidewalk surface, these records account for **7,248,878** square feet of damage (**16%**). **"High"** and **"Very High"** damage represents **31%** of this damage total.

Trees - The citywide inventory for Trees found that there are approximately **42,661** "tree" point locations. Of these records, a tree is present at **38,416** of the locations. The remaining **4,245** point locations represent **Tree Well Only** locations.

Parking Restrictions - The citywide inventory for Parking Restrictions found that there are **35,174** locations of painted curbs. These locations represent a citywide total of **669,730** linear feet of painted curb. Red curb makes up the majority with **88%** of the total.

ADA Barriers (other than sidewalk damage and tree barriers) - The citywide inventory for ADA found that there are **48,786** Cross Slope Hazard locations making up **88%** of all ADA locations. The remainder consists of **4,122** Obstruction locations making up **7%** of the total, **2,929** Travel Direction Slope hazards making up **5%** of all locations and **85** Vertical Hazard (sudden drop-off) locations.

Curb / Gutter Damage - The citywide inventory for Curb Damage found that there are **50,550** damage records. These records account for **329,567** linear feet of damage. "High" and "Very High" damage represents **44%** of this total.

The citywide inventory for Gutter Damage found that there are **9,036** damage records. These records account for **236,187** square feet of damage. "High" and "Very High" damage represents **29%** of this total.

Signs - The citywide inventory for Signs found that there are a total of **45,475** sign pole locations and **55,535** signs. These record counts are not the same due to the fact that more than one sign may reside on one pole location. Regulatory signs make up the majority of the locations with a total of **40,429** signs (**73%**).

Bus Stops - The citywide inventory for Bus Stops found that there are a total of **1,665** Bus Stop locations. Of these locations, **498** have Benches and **126** have Bus Shelters.

The results of this inventory and database are not static. The physical environment, as well as the features collected in this inventory, are in constant flux. If maintained, this database will prove to be an extremely valuable management and decision making tool for many years to come.

Cost:

The Sidewalk Damage Cost Analysis separates the two causes, damage caused by tree and damage caused by other events, in order to derive a cost for each. The separation reveals the following costs to repair.

Damage, other than tree	$ 60,112,980
Damage, caused by tree	$ 19,799,184
Total Sidewalk Estimate	**$ 79,912,164**

Gutter/Curb Cost Analysis is also a consideration for overall total project Cost citywide. The estimated cost for Curb / Gutter damage is as follows.

Curb Damage	$ 5,534,500
Gutter Damage	$ 1,870,220
Total Curb / Gutter Damage	**$ 7,404,720**

Total Sidewalk/Curb/Gutter damage is estimated to be $87,316,884.

Introduction

The City of Oakland has more than 400,000 citizens residing in 79.8 square miles of land area. There are more than 100,000 individual public and privately owned parcels within the city limits. Oakland continues to experience significant residential growth, with numerous housing developments under construction in many locations adjacent to the 836 miles of street centerlines. Oakland residents and visitors regularly utilize hundreds of miles of sidewalks associated with the city street network. The condition of these city sidewalks are at the center of this unique inventory.

Damaged sidewalks have been, and continue to be a major concern of city officials. Yearly, the City invests hundreds of hours and thousands of dollars addressing issues regarding sidewalk repair and safety. Personal injury to pedestrians from "trip-fall" accidents is primarily a result of sidewalk damage problems. These accidents often require the City to make monetary compensation to injured citizens.

In addition to the sidewalk damage problems, there are equally important concerns regarding the City's compliance with the Americans with Disabilities Act (ADA). The ADA Title II regulation requires that cities must maintain sidewalks under their jurisdiction in operable working condition. Prior to the *Barden* decision (see below), it was commonly understood that the minimum requirement for achieving program accessibility, in an existing public right-of-way that is not otherwise being altered, is the installation of curb ramps at locations where existing pedestrian walkways cross curbs.

In January 2004, the United States Court of Appeals for the Ninth Circuit granted final approval of the settlement in *Barden v. Sacramento*. This case set a nationwide precedent requiring cities and other public entities to make all public sidewalk systems accessible. As a result of the court's ruling in this case, public entities must address barriers such as missing or unsafe curb cuts throughout the public sidewalk system, as well as damage and other barriers that block access along the length of the sidewalks. Following the

court victory, the parties reached a settlement addressing all sidewalk barrier issues citywide.

The court understood the significant financial impacts of this order, therefore it did not force cities to begin wholesale repair of damaged sidewalks immediately. The ruling stated that cities must, at minimum, craft a mechanism for corrective action for sidewalk repairs over some period of years. This mechanism is called an **ADA Transition Plan**. This document must contain the particular city's approach to identifying problems, and then detail a plan for implementing a phased "transition" from impassable sidewalks to passable sidewalks for all of its citizens.

The Public Works Agency, through various mechanisms, had estimated that it will cost approximately **$100 Million** to repair all of the damaged sidewalks in Oakland. The agency decided that a comprehensive planning/engineering study was needed in order to quantify the amount of actual sidewalk damage, and to substantiate the cost-to-repair figure. Therefore, in April 2004, the City Public Works Agency prepared and released for competition a Request for Proposals for a **Citywide Sidewalk Condition and ADA Survey**. This exhaustive survey combined with the existing curb ramp inventory database provides a comprehensive geospatial database of the public right of way.

This report is the culmination of that effort. It will detail the planning process, technical approach, methodology, and eventual findings of a very challenging and exciting comprehensive citywide inventory.

Project Scope

- **<u>Scope of Services</u>**

The City's initial Scope of Services stated that the consultant team would "conduct a citywide sidewalk condition/ADA inventory and create a geospatial database from the data collected," that is compatible with the City's current GIS.

Our team's initial scope was to inventory, locate and catalogue the extent of damage to sidewalks, as well as to identify other ADA issues. The City realized that this comprehensive "feet on the ground inventory" was a valuable opportunity, and ultimately decided to add Addendums to the Scope of Services that included the collection of trees, signs, curb/gutter damage, curb markings, and bus stops.

The final inventory list would include the development of seven different feature layers for collection. Those layers include:

Sidewalk Damage

Trees and Tree Wells

ADA Barriers (other than sidewalk damage and trees)

Parking Restrictions (Curb Markings)

Curb / Gutter Damage

Signs

Bus Stops

Each of the above features layers contain a variety of specific attribute information along with auxiliary data. Multiple attribute collection was a key driver in creating a database that would detail the necessary information to define each feature and data layer clearly.

The decision on the exact attributes (characteristics) needed to define these features was made during the project development phase. The consultant team conducted many comprehensive planning sessions with City staff to obtain an acceptable list of attributes.

It is important to note at this time that this inventory does not address the above layers on a global basis. ***The project was initially conceived and developed as a Sidewalk Survey Project, therefore all data collected is associated with City sidewalks. The actual physical parameters of the collection are from the curb and gutter to back of the sidewalk***. Signs, and trees that are located behind sidewalks, in street median strips, or exist where no sidewalk is present, are NOT a part of this inventory

- **Deliverables**

Geodatabase: The geodatabase is the primary project deliverable. The Geodatabase contains all collected project data and was created and maintained using ArcGIS version 9.1. Likewise all summary information in terms of tables, charts, etc. are extracted from data in the geodatabase.

The database also contains over 100,000 digital photos linked to each record of sidewalk damage. This deliverable represents the culmination of close to two years of work and presents a huge undertaking. The results of which are a uniquely rich repository of geospatial data.

Metadata (data about the data) has been imbedded into the geodatabase. This Metadata describes the detail of the project, including Information such as, project description, data collection start / end dates, layer identification, consultants involved, what technology was used etc. This information is extremely important for the city team in order to correctly utilize this product. Years from now the city will still be able to use this framework as a mechanism for the continued development of this infrastructure database.

Mapping: The final mapping product is a vital deliverable. Every attempt was made to clearly define physical field features in an orderly and consistent manner.

The map must clearly tell a complete visual story of the findings of the inventory as best can be achieved. This map product covers the entire City of Oakland using a total of 286 (22”x34”) map sheets. The City of Oakland Sewer Gird was used as the boundary file. It covers all city neighborhoods, districts, and boundaries. The maps show the orthophoto (aerial photo) overlaid onto the city street centerline file, and parcel data layer.

The geospatial database was used to print this deliverable in hard copy, color prints at 1”=100’. Additionally, the consultant will set up for the city a *routine* to print the entire Map Book (PDF format) at a larger scale of 1” = 50’. This larger scale map set-up provides an easier to read, more suitable product for detailed reviews. [This product will eventually require the printing of 1144 sheets (22” x 34”)].

Please see the appendix of this document for examples of both the 100 scale and 50 scale map sheets.

Supplemental Documents: The total effort of the project inventory included the development of numerous planning, and training documents that may not be suited for inclusion into this report. They included items such as PDA / ArcPAD Training Manual, Field Re-training Manual, QA/QC Detailed Work Sheet and others. All of the project related information was submitted in the final Project Close out phase.

Methodology

- **Data Collection Criteria**

A detailed review of all collection parameters defining collection features, and attributes are contained in the Metadata Master Plan (MMP), Please see Appendix for more details. The MMP constitutes the backbone of the inventory and contains more than 90 different fields of data.

Sidewalk Damage: The primary purpose for the collection effort was the need to catalogue damaged sidewalk locations, and to record the extent and degree of "damaged sidewalk." The collection criteria for the project were based on predetermined standards set by the City's Public Works Agency. The primary collection choices were "Type," "Degree" and "Cause" of damage.

"Type" of damage was divided into the following categories:

- Faulting
- Cracks
- Uplift
- Depressions

"Degree" of damage was evaluated by field collection staff as follows:

- Low: Between ¼" and ½"
- Moderate: Between ½" and 1½"
- High: Between 1½" and 3"
- Very High: Greater than 3"

Digital photo examples of these conditions are displayed in the appendix of this document.

American with Disabilities Act (ADA): ADA concerns were a primary area of interest and sidewalk damage, tree barriers and other ADA barriers in the pedestrian travelway was copiously collected.

A feature specifically requested by the City ADA Coordinator was the *Land Use* designation. The programming set up required that the Land Use field be populated prior to actual feature collection on a segment.

The team decided on three Land Use designations:

- Residential
- Commercial
- Essential Facilities

The purpose of this designation was to determine which areas would generate higher pedestrian usages, therefore potentially creating larger travel problems. For example, schools, public buildings, and libraries were grouped under the Essential Facilities land use.

Please note that all items collected as ADA barriers fall within the 36" wide by 80" high "clear path of travel". The primary ADA indicators are:

- Sidewalk Damage
- Cross Slope
- Travel Direction Slope
- Tree Hazards
    - Tree Well Only
    - Low Tree Well
    - Low Tree Limb
    - Tree Trunk Lean

Tree Grate

- Obstructions

Transportation Obstructions

Commercial Obstructions

Other Obstructions

This report, and statistical findings will address ADA in general terms. A comprehensive list of ADA features and associated attributes is contained in the MMP in the appendix of this document.

A key field which was added to the MMP that greatly aided the ADA evaluation was the field "Is damage in Travelway?" Sidewalk damage in itself did not necessarily impact ADA navigation of sidewalks, unless it was located within the required 36" clear path of travel.

Team member **Policy Innovation Works** (PIW), prepared a separate comprehensive document, a draft **ADA Sidewalk Transition Plan 2007**. Statistical findings related to all ADA-related issues will be presented and analyzed in further detail in that document, which is a required component of the City's ADA Transition Plan.

Curb/Gutter Damage: The consultant team was instructed that curb/gutter damage "degree" would be similar to that of sidewalks, except that the collection data would be logged in linear feet for curbs, and square feet for gutter.

During the preliminary stages of the report it was found that small niches in curbs occurred so frequently that full collection would have been a massive effort, and of little aid to the City in cataloguing meaningful damage hazards. It was subsequently determined that "Low" damage would not be recorded. "Moderate," "High" and "Very High" were the primary damage collection degree categories.

Trees: Tree collection was a major issue. A significant amount of sidewalk damage and ADA travelway issues are believed to be caused by trees. In addition to trees' relationships to damage, this inventory would help create an electronic geodatabase of tree species.

The tree collection criteria included numerous attributes. The basic attributes were:

- Location
- Trunk Diameter
- Tree Well, No Tree Well
- Low Well
- Trunk Lean
- Condition
- Species

Please see Metadata Master Plan in the appendix for further detail on tree attribution.

Parking Restrictions (Curb Markings): This collection effort was fairly simple. It did not require a large list of criteria. The team would locate, and identify all colored curb markings and measure the length. The color categories were as follows:

- Red (No Parking)
- Green (10 Min. Parking)
- Yellow (30 Min. Parking)
- Blue (Handicap Parking)
- White (Loading Zone)

Signs: Signs were divided into four categories:

- Street Name
- Regulatory (a sign enforceable by law)
- Caution (yellow in color)
- Temporary (orange in color)

The team collected specific attributes for each sign including location, condition of sign, and pole type (metal, wood, streetlight or traffic signal).

While Street Name, "Caution", and "Temporary" signs fit neatly into their classification, identifying each regulatory sign required our team to program more than 200 types of regulatory signs into the PDA for field collection purposes. Please see appendix to view the California Regulatory signs documentation.

Bus Stops: The team collected the following information for bus stops:

- Location
- Pole Type
- Bench
- Shelter
- Bus Pad

AC Transit also provided us with their GIS-formatted bus route electronic file, which would become an additional overlay and resource for this inventory.

- **Data Collection Areas**

Planning the Canvassing Approach**:** Although the final GIS / geospatial database is referenced and queried by Council districts, TranSystems approached the actual field data collection by dividing the City into smaller, more manageable, geographic areas. The City's existing configuration of 12 Neighborhood Planning Districts, were perfect for this purpose. Please see Figure 1 on following page.

The City's existing configuration of 12 Neighborhood Planning Districts was also more practical for organizational and field training duties tasks. Selecting the Prototype Area, Figure 1 (with city staff input) was also done with regard to Planning Districts. The plan areas listed below and on the following map were the basis for the initial inventory:

1 - Chinatown Central

2 - West Oakland

3 - North Oakland

4 - San Antonio

5 - Fruitvale

6 - Central East Oakland

7 – Elmhurst

8 - Lower Hills

9 – Harbor

10 – Airport

11 - South hills

12 - North Hills

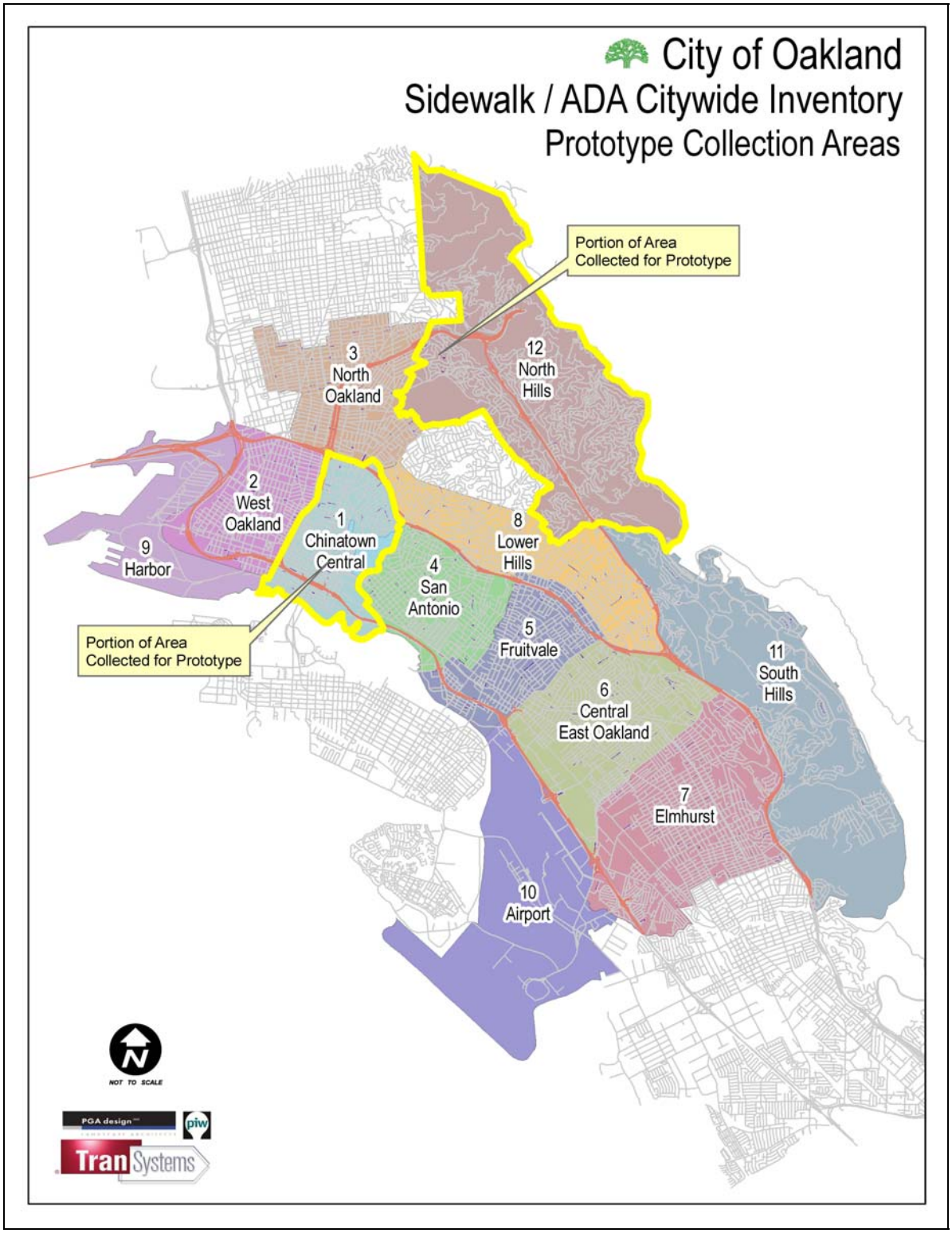


Figure 1: Plan area / prototype map

Using the *plan areas* helped to condense the routing tasks. It also allowed for better development, and management of the database. Data uploads, reviewing, data checking, synthesizing, and cleaning the geodatabase were also easier to manage in plan areas. Dividing the city into plan areas also helped to keep the field techs motivated, since they often derived a great sense of accomplishment and a newfound energy when they moved on to a new *plan area.*

- **<u>Schedule (timeline for each phase)</u>**

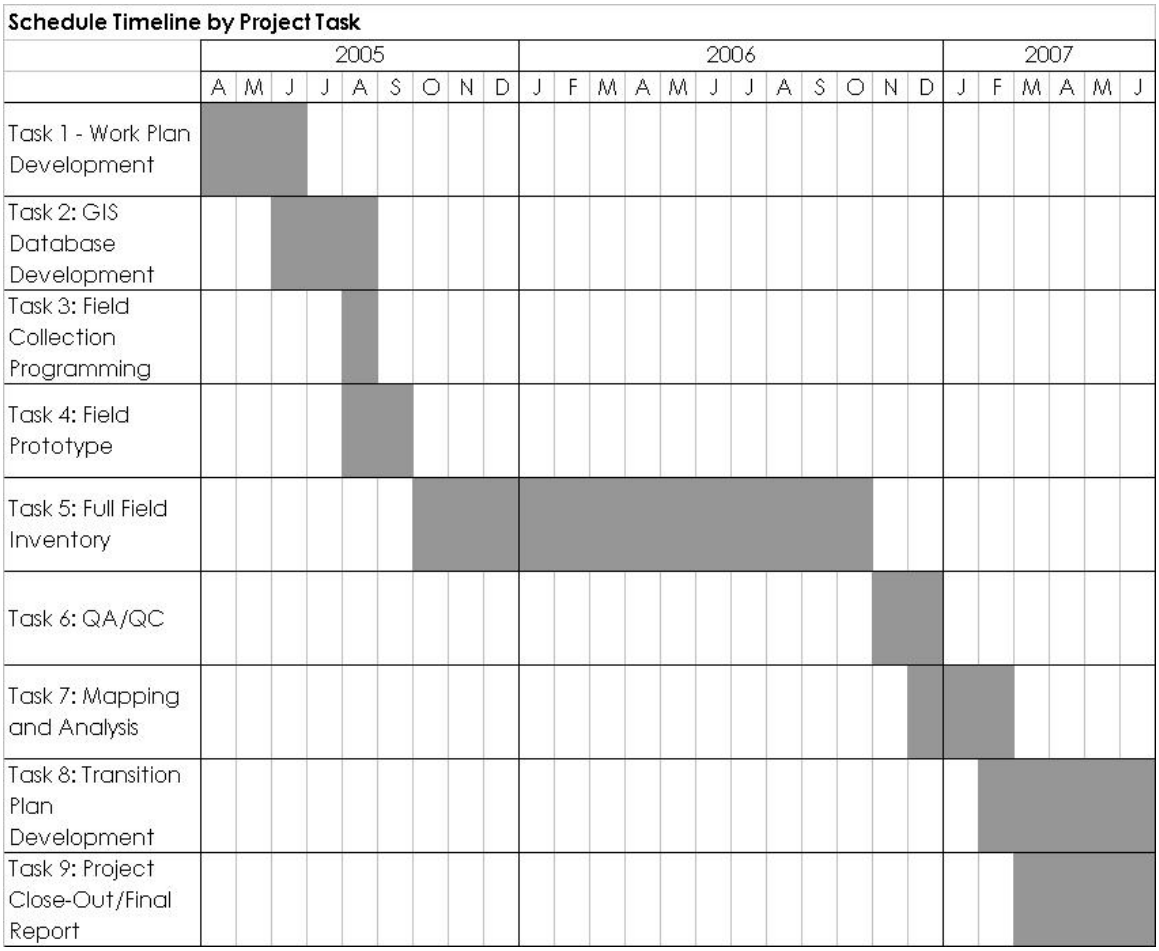


Figure 2: Project Schedule

- **Staffing (FTE's + man hours to accomplish survey)**

TranSystems followed the City's preference for utilizing local citizens wherever possible on City contracts by hiring technical staff from local schools and work programs. The initial eight-person field team included six local residents, including two Laney College students, two from the Oakland Private Industry Council, and two from Cypress/Mandela Training Center. The team's Project Manager and Senior GIS Analyst are also Oakland residents.

The team's combined effort resulted in more than 21,000 hours of labor attributed to the consultant team. This total represents a combination of field collection, and office labor for project tasks. It does not include the investment of time by city staff.

- **PDA Data Collection**

Programming: Once the database design was completed and the MMP was in place, the next task was to initiate programming for field collection. ArcPad was loaded into the 8 – 10 PDA's for field collection purposes. ArcPad mobile software allowed integration of collected field data, directly into the ArcGIS geospatial database in the desktop computer.

Programmers began programming the entire MMP into the PDA's. This was quite a large task. Over 100 options were programmed for sign types, and more than 150 for tree species types. Some data was collected as point features, while others were collected as linear features. Some fields were programmed for Yes/No responses, while others were multiple choice responses such as "Low," "Moderate," "High" or "Very High" damage. These response choices were reached after months of planning.

Navigational ease through the all of the menu selections was a priority. Field technicians had to be able to collect data in a detailed, yet expeditious manner. Logical task progression and

visual ease of selection were extremely important factors in the menu design. All relevant field attributes had to be displayed in an orderly, user-friendly manner. This data was displayed in various menus designed to "drill down" for detailed information collection. Each technician was then trained on the proper means of navigating through the PDA menus in order to select, and record the appropriate data.

Photo Automation: One of the most important aspects of the project would be the GIS's ability to automatically link digital photos directly to the sidewalk damage database. The city felt it was critical to record damage in a database, *and* to have the ability to actually see a photo of the damage. This would provide the city with substantial confirmation of the damage characteristics for repair, or litigation issues, see Figure 3.

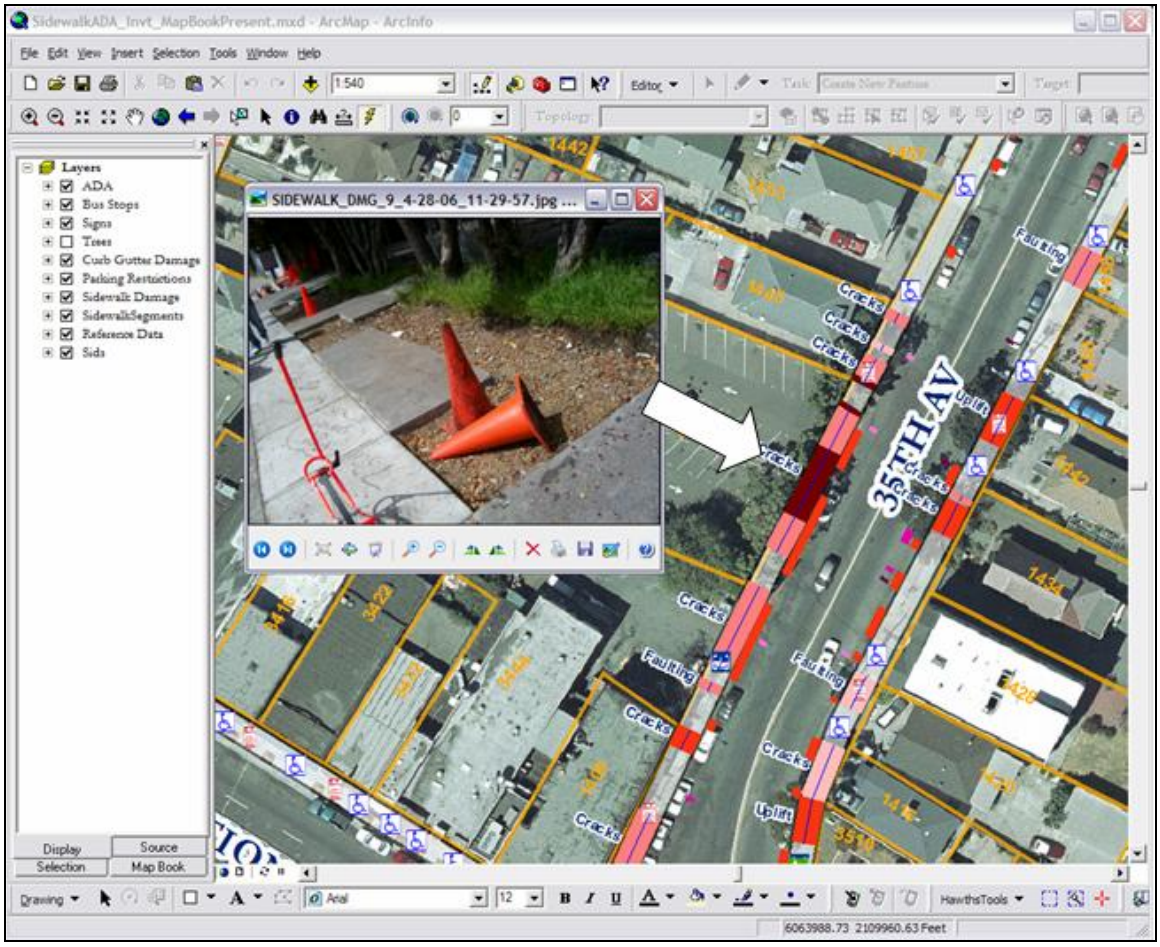


Figure 3: Photo link example

Normally photos would have to be taken, identified and then manually linked to the specific damage incident. Considering over 100,000 photos were taken, this would have been an extremely labor intensive, and cumbersome process. As a result the consultant's task was to fully automate the photo process. Therefore the team programmers set out to write an application for ArcPad that would meet this goal.

After researching numerous other methods of getting the photo into the PDA, the project team decided on an approach that simply moved the Secured Digital (SD) card from a moderately priced digital camera over to the PDA to "log the photo". This approach was painless, it took 10 -20 seconds to complete, and it produced high quality photos. The process was to record the damage in the PDA, take the photo, then remove the SD card from the camera, place it in the PDA and then press the menu "Log photo" button. A successfully logged photo would result in a photo I.D. number being placed into the database for the collected damage record.

Planning the Canvassing Approach**:** For each day's work, team leaders produced hardcopy routing maps every morning to review with techs. TranSystems' GIS analysts had pre-measured each block, using the "line segmentation" process. The field technicians checked this method by actually rolling segments of blocks with distance wheels to verify lengths. The in-house GIS measurements of blocks and segments provided sound Q/C checks on actual distances measured by technicians in the field.

Task Separation: Initially, each survey tech was assigned to a segment. His/her task was to inventory *all* seven feature layers. It soon became apparent that this was too much data for one tech to collect, resulting in many missed features. Another problem was that the PDA programming could not sustain this model. Too many menus "open" simultaneously caused the PDA to crash on a regular basis.

We decided on a model that would have four techs collect sidewalk damage and ADA features (including taking photos and measuring slope with smart levels). The other four techs concentrated on the items closer to the curb, such as curb/gutter damage, trees, parking restrictions, signs and bus stops. This model was proven to be more effective, since concentrating on fewer collection items yielded more accurate data and significantly sped up the collection process. This model also eliminated the problem of PDA's crashing.

Routing: The routing task presented a far greater challenge than was anticipated. The problem was not the routing of segments itself, but verifying that all assigned segments had been collected. With so many sidewalk segments to canvass, it was very easy for field techs to inadvertently miss a segment. Team leaders would assign each tech a group of segments to canvass. At the end of day, completed segments would be marked off as completed.

The sophistication of GIS allowed for the office GIS staff to review the data collected. When they found segments that had no data linked to them, they would order a field check to be done in order to make sure that the segment was "clean," with no data to be collected, and had not been missed. The PDA allowed the techs to make field notes regarding this and other field conditions that warranted the GIS Analyst's review for potential correction in the database.

- **GIS Data Integration**

Prior to the onset of this project, the City's ITD staff had developed its own high-quality citywide GIS. This GIS was developed to provide flexible tools to manage and analyze city infrastructure, and other assets across many disciplines and departments, including engineering, planning, and economic development.

TranSystems utilized a methodology in ESRI's ArcGIS version 9.1 program for collecting *line, and point* field data called "Dynamic

Line Segmentation". This process simplified the collection process which otherwise would have required the use of technology such as handheld GPS (Global Positioning System). The line segmentation approach made it possible to draw *line segments* over each sidewalk, using the citywide orthophoto. Then each segment was assigned its own unique ID number. In the field, technicians collected data along the segment lines displayed in the PDA. Data collected was automatically assigned to the "selected" segment.

A total of seven distinct GIS layers were collected for the project. Details on collection criteria where laid out in the Methodology section of this report. Field data was collected with PDA's using ESRI's mobile software package, ArcPAD 6. Collected data was downloaded daily from the PDAs to the desktop computers running ArcGIS 9. When all data was collected, the final geospatial database would be usable in all scales, from council districts to citywide summaries. The geodatabase even facilitates a spatial detection of damage locations at singular parcel levels.

Summary of Findings

The following pages will summarize the citywide project findings overall and by layer. To see a detailed Council District breakdown of any of the data listed in the "Summary of Findings", reference the "Tables and Charts" section in the Appendix*. Please see disclaimer below.

Before continuing, it is important to make note of the total sidewalk area, total gutter area and land use breakdown. All details will be displayed in tables and charts to help to convey the key project findings.

The data collected citywide for Sidewalk Area, Gutter Area and Land Use can be summarized as follows:

Sidewalk Segment Variables		Area (Square Feet)	Percent of Total
Total Sidewalk Area		44,712,624	100%
Total Gutter Area		7,746,321	100%
Land use	Residential	31,776,956	**71%**
	Commercial	10,274,122	**23%**
	Essential Facilities	2,661,546	**6%**

Table 1: Sidewalk Segment details

*Disclaimer: You will note that in some cases the values shown in the "Summary of Findings" section of this document do not match the values of tables and charts in the appendix. This is due to the rounding of multiple values calculated in Microsoft Excel and in some cases, specific data was not included in the calculations.

The tables and charts shown in the "Summary of Findings" section of the document are accurate and not effected by rounding or the non inclusion of data.

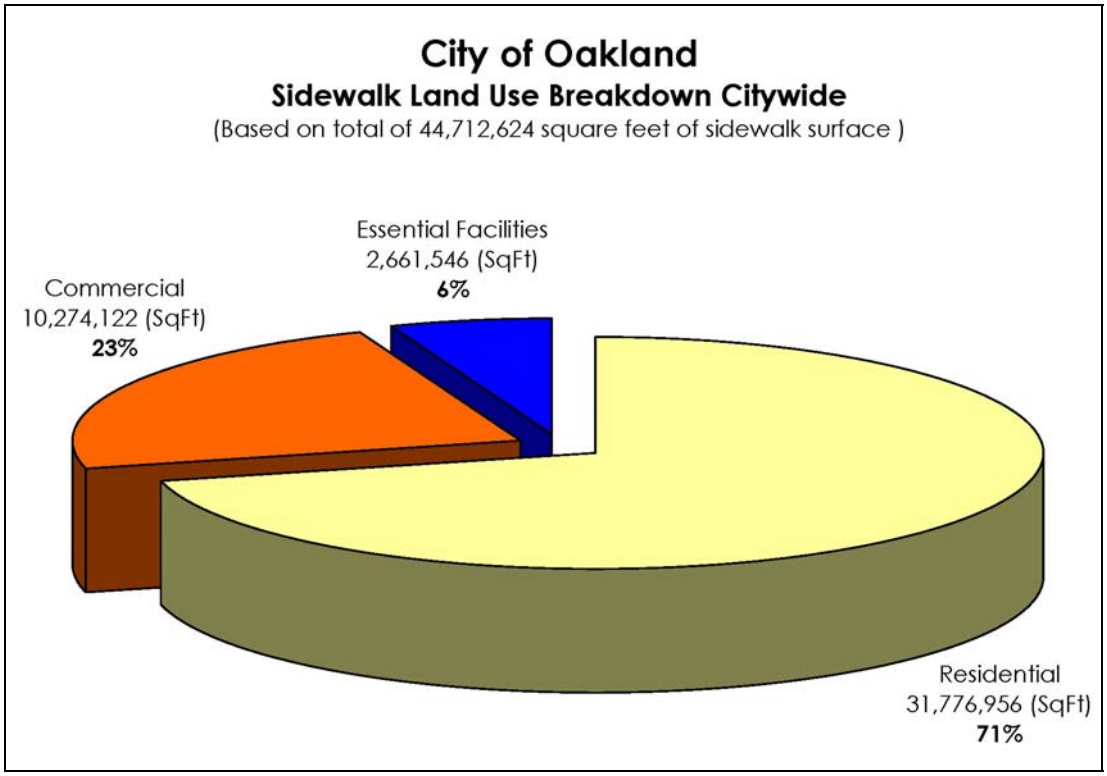


Figure 4: Land Use breakdown citywide

This inventory contains a robust set of data collected over a one-year period. The full field collection was completed on November 10, 2006, with the final QA/QC completion on December 20, 2006.

The data collected citywide can be summarized as follows:

Feature Count Breakdown Citywide		
Feature Class	**Locations**	**Percent of Total**
Sidewalk Damage	110,715	33%
Trees & Tree Wells	42,661	13%
Parking Restrictions	35,174	10%
ADA Barriers	53,999	16%
Curb Gutter Damage	50,550	15%
Signs & Markings	45,475	13%
Bus Stops	1,665	0%
Total Count of Collected Features	**340,239**	**100%**

Table 2: Feature count breakdown citywide

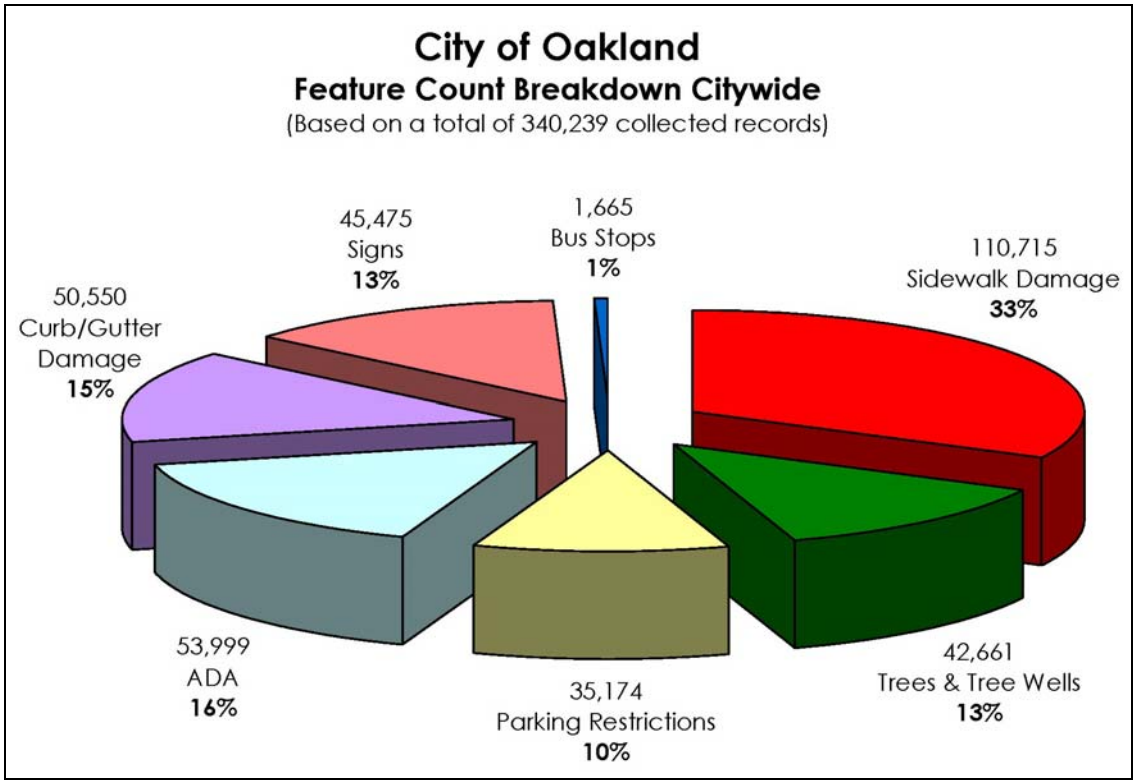


Figure 5: Feature count breakdown citywide

- **Sidewalk Damage Condition**

Sidewalk Damage - The sidewalk inventory captured by survey is 1,126 miles. The citywide inventory for Sidewalk Damage found that there are approximately **110,715** damage records. Of the 44,712,621 total square feet of sidewalk surface, these records account for **7,248,878** square feet of damage (16%). **"High"** and **"Very High"** damage represents **31%** of this damage total.

In the database development section, damage has been divided into four distinct categories, based upon type and degree. Although the damage is displayed in four degree levels, the categories for "High" and "Very High" represent significant red flags.

Data collected citywide for this layer can be summarized as follows:

Table 3: Sidewalk Damage details

Damage Location Variables		Feature Count	Damage Area (SqFt)	Percent of Total
Damage Type	**Cracks**	51,203	2,672,711	**37%**
	Depression	19,545	1,510,211	21%
	Faulting	31,020	2,089,847	29%
	Uplift	7,691	974,245	13%
	Under Construction	251	1,864	0%
	No Sidewalk	1,005	0	0%
Totals		110,715	7,248,878	100%
Damage Severity	*0 - None*	1,256	1,864	0%
	1 - Low	29,681	1,366,474	19%
	2 - Moderate	49,807	3,158,477	**44%**
	3 - High	24,700	2,111,960	29%
	4 - Very High	5,271	610,103	8%
Totals		110,715	7,248,878	100%
Damage Cause	**Old Age**	91,725	5,594,042	**77%**
	Sewer	682	31,269	0%
	Utility	7,352	383,558	5%
	Tree	10,956	1,240,009	**17%**
Totals		**110,715**	**7,248,878**	100%

** Under Construction and No Sidewalk occurrences both contain a severity rating of 0.*

** No Sidewalk has no width value so in turn has no area calculation.*

** Values may differ from the Sidewalk Condition by Council District table in the appendix due to the removal of Under Construction and No Sidewalk Damage types and rounding differences.*

** **Percent of total** is calculated using square footage, not by feature count*

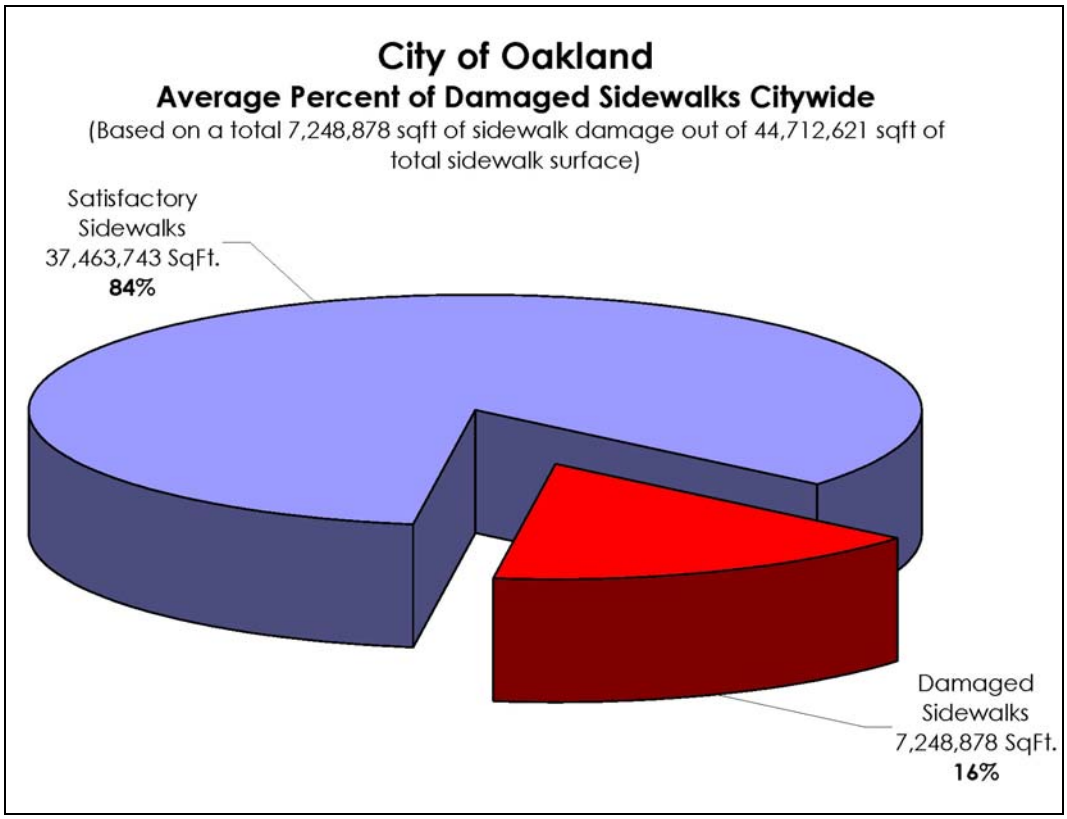


Figure 6: Percent of Sidewalk Damage Citywide

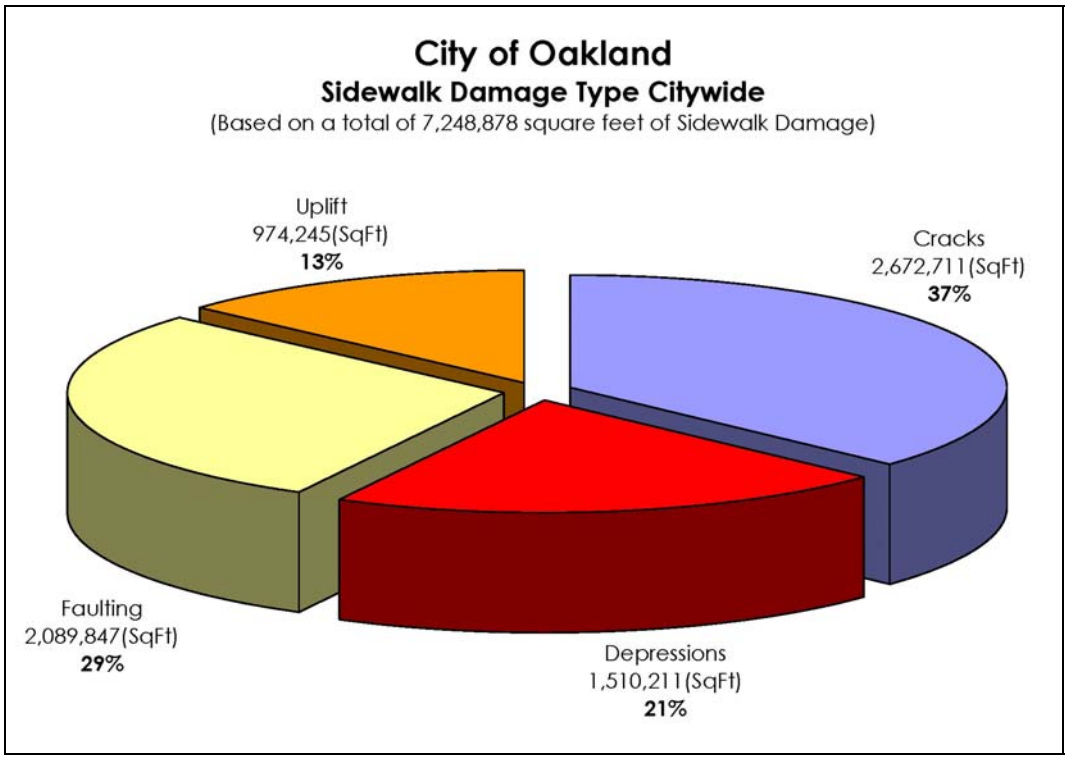


Figure 7: Sidewalk Damage Type breakdown

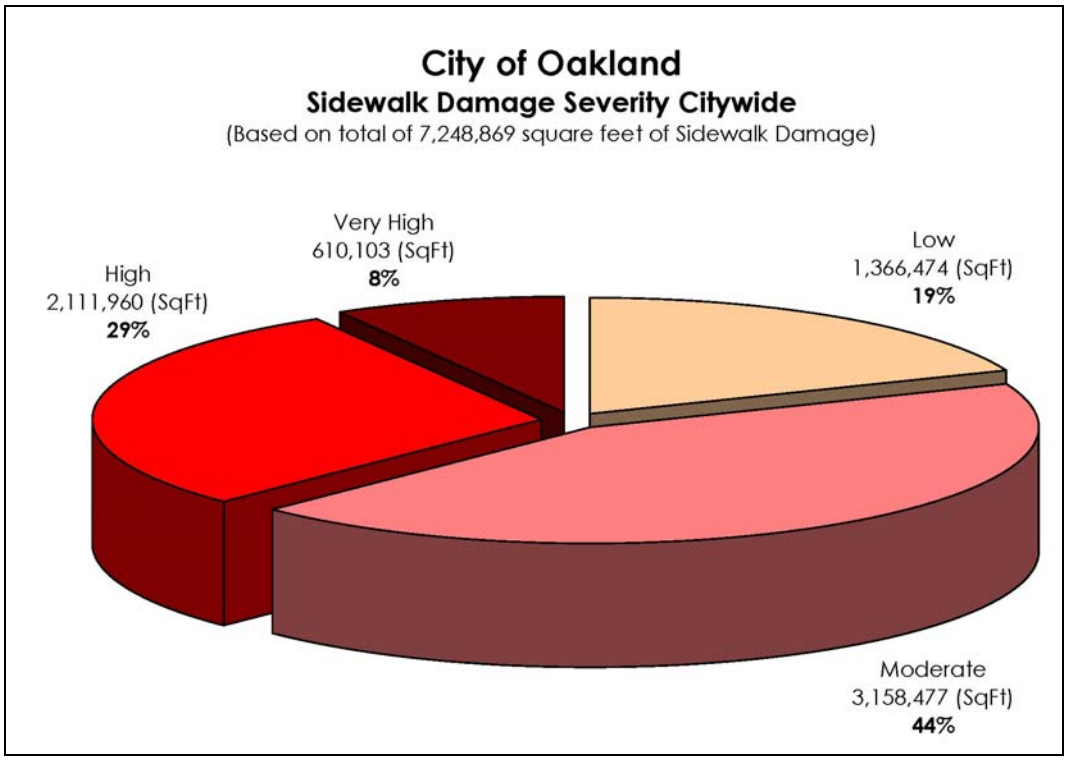


Figure 8: Sidewalk Damage Severity breakdown

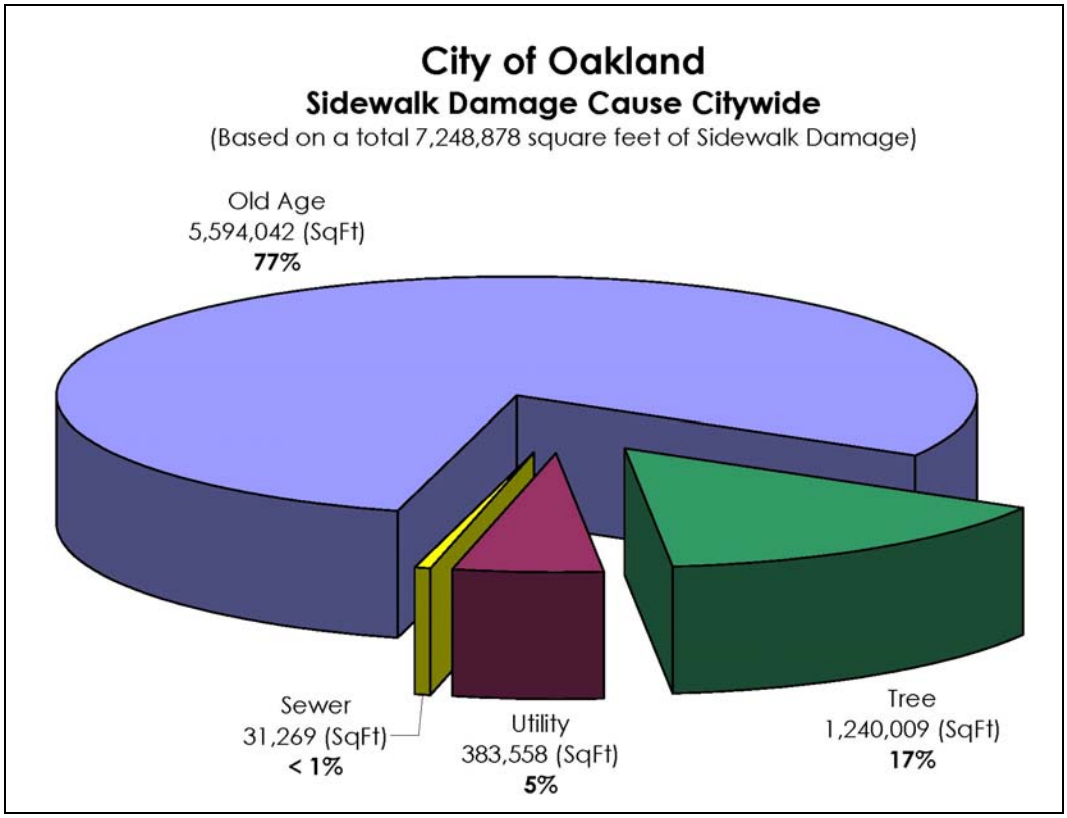


Figure 9: Sidewalk Damage Cause breakdown

- **Tree Condition**

The citywide inventory for Trees found that there are approximately **42,661** "tree" point locations. Of these records, a tree is present at **38,416** of the locations. The remaining **4,245** point locations represent **Tree Well Only** locations. The ten most prevalent species make up **20,186** locations or **53%** of all tree locations. All other species make up **18,230** locations or **47%** of all tree locations. A Detailed species list showing a complete species breakdown, can be found in the appendix.

Data collected citywide for this layer can be summarized as follows:

Tree Location Variables	Count	Percent of Total
Total "Tree" Locations	42,661	100%
Tree Present	**38,416**	90%
Well Only	**4,245**	10%
Breakdown of 10 Most Prevalent Species		
Platanus acerifolia (Ash)	3,788	10%
Liquidamber styraciflua (Sweetgum)	3,312	9%
Pyrus calleryana cvs (Pear)	2,683	7%
Prunus cerasifera/blireiana (Purple Leaf Plum)	2,048	5%
Lagerstroemia indica (Crape Myrtle)	1,953	5%
Pyrus kawakami (Evergreen Pear)	1,427	4%
Magnolia grandiflora (Southern Magnolia)	1,375	4%
Fraxinus o. `Raywood' (Ash)	1,327	3%
Pistacia chinensis (Chinese pistachio)	1,150	3%
Acer sp (Maple)	1,123	3%
Total of 10 Most Prevalent	**20,186**	53%
Count of Remaining Species	18,230	47%
Trees Per Mile (based on 1126 linear miles of Sidewalk)	**34**	

Table 4: Tree collection details citywide

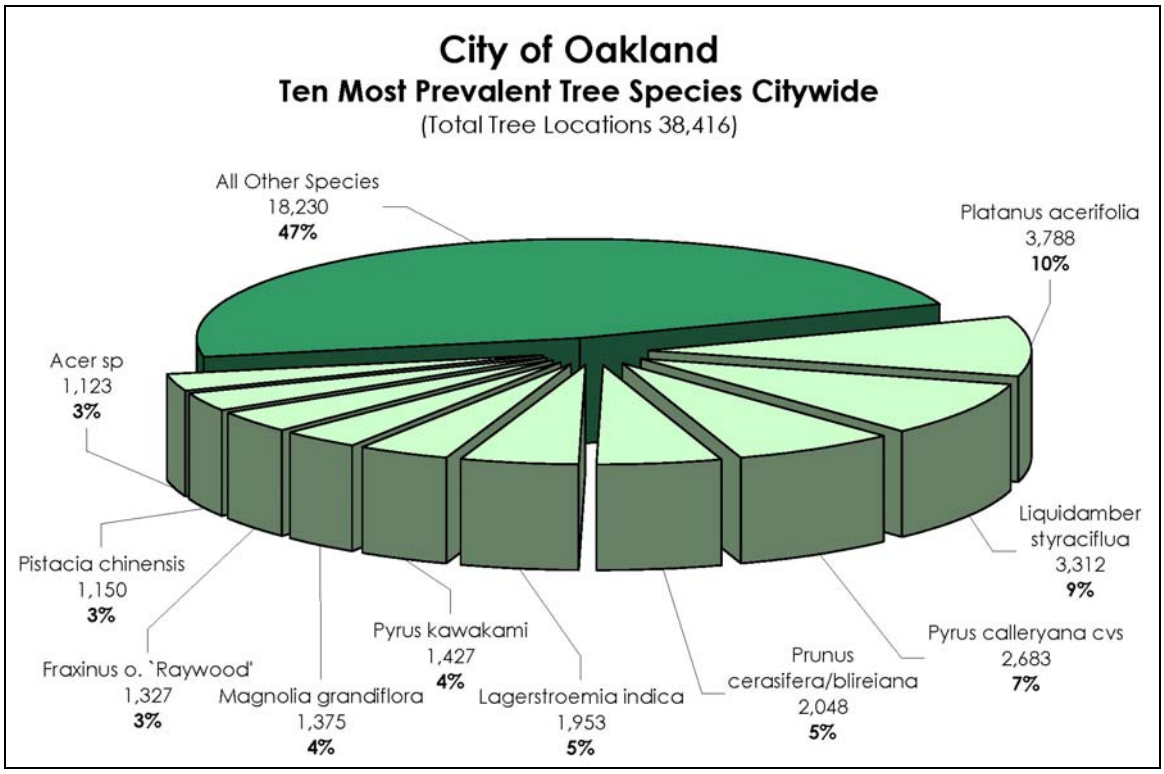


Figure 10: Ten most prevalent species citywide

- **Parking Restrictions (Curb Markings)**

The citywide inventory for Parking Restrictions found that there are **35,174** locations of painted curbs. These locations represent a citywide total of **669,730** linear feet of painted curb. Red curb makes up the majority (**88%**) with a total of **32,410** locations, running a total of **591,611** linear feet.

Data collected citywide for this layer can be summarized as follows:

Table 5: Parking Restriction details citywide

Curb Color	Feature Count	Length (Ft)	Percent of Total
Blue - Handicap Park	846	18,692	**3%**
Green - 10 Min.Park	262	9,754	1%
Red - No Parking	32,410	591,611	**88%**
White - Loading Zone	631	16,178	2%
Yellow - 30 Min, Park	1,017	33,246	5%
Other	8	249	0%
Totals	**35,174**	**669,730**	**100%**

** Percent of total is calculated using linear feet and not by feature count*

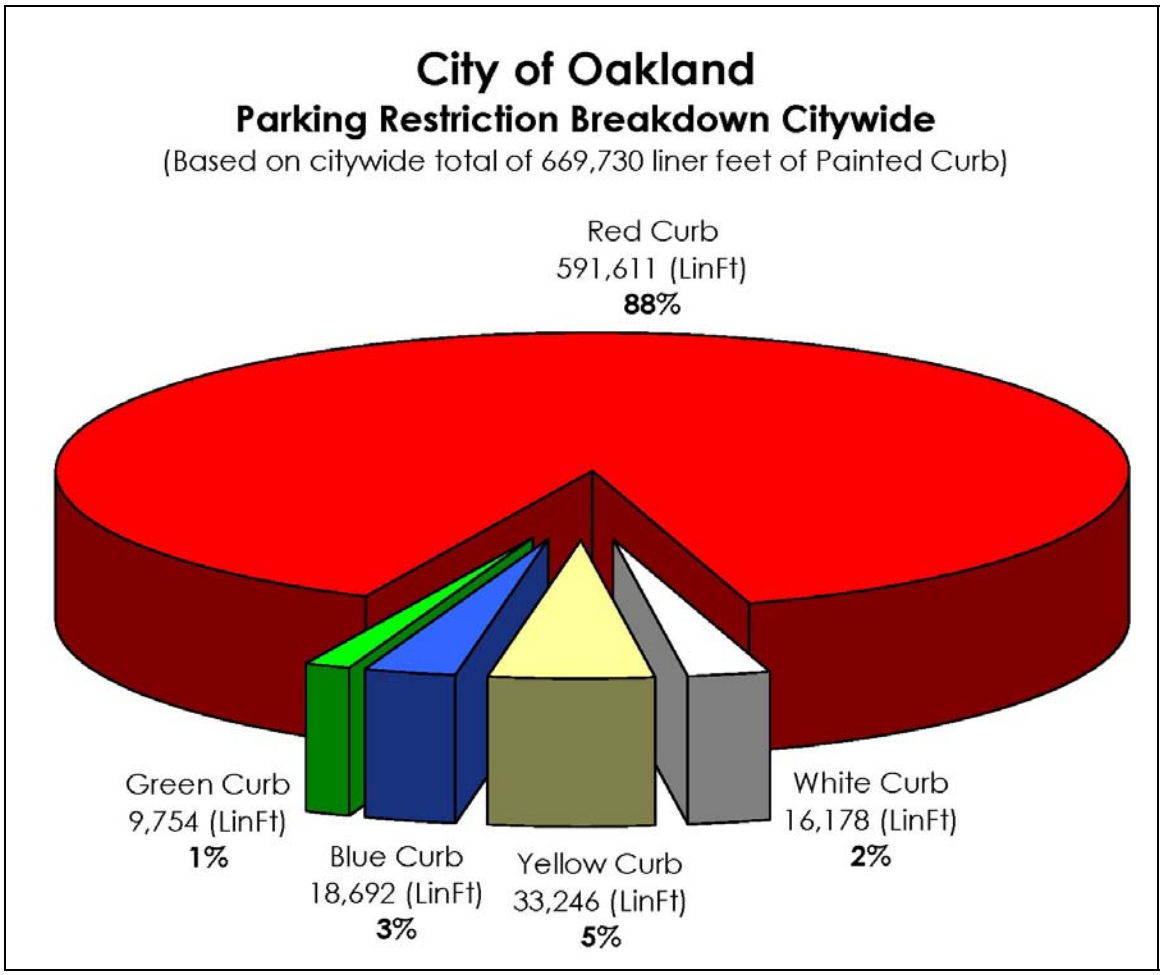


Figure 11: Parking Restriction breakdown citywide

- **ADA Inventory**

For the purpose of the survey, a 36-inch wide continuous path of travel was the standard area for collecting ADA barriers in each sidewalk segment. An ADA barrier was cataloged only if it was located within the ADA Path of Travel. Subcategories for ADA barriers span across three of seven survey database map layers (ADA, Sidewalk Damage and Tree) and include sidewalk damage, tree and tree well barriers, excessive slope (travel direction or cross slope), obstructions, and sudden drop off.

For the ADA map layer, or feature class, attribution was collected for the following four categories: Cross Slope, Travel Direction Slope, Obstructions and Vertical Hazard (sudden drop-off). The citywide inventory for ADA feature class found that there are **48,786** Cross Slope Hazard locations making up **88 percent** of all ADA locations. The remainder consists of **4,122** Obstruction locations making up **7 percent** of the total, **2,929** Travel Direction Slope hazards making up **5 percent** of all locations and **85** Vertical Hazard (sudden drop-off) locations.

Data collected citywide for the ADA feature class is shown in Table 6 and Figure 12a. The combined ADA inventory, across all survey layers, is shown in Figure 12b.

Table 6: ADA collection details citywide

ADA Location Variables		Feature Count	Percent of Total
Cross Slope Hazards	2-5%	18,918	34%
	>5%	3,140	6%
	Driveway	26,728	48%
	Totals	48,786	**88%**
Travel Direction Slope Hazards	5-8%	793	1%
	>8.33%	727	1%
	Driveway	1,409	3%
	Totals	2,929	**5%**
Obstructions	Transportation	183	0%
	Commercial	11	0%
	Other	3,928	7%
	Totals	4,122	**7%**
Vertical Hazards		85	0%
Total Point Features Collected		**53,999**	

* Approximately 1% of the total point features contain more than one of the above variables. (Example: one point may contain values for both cross slope and obstruction) Due to this, feature count values will not add up to 53,999.

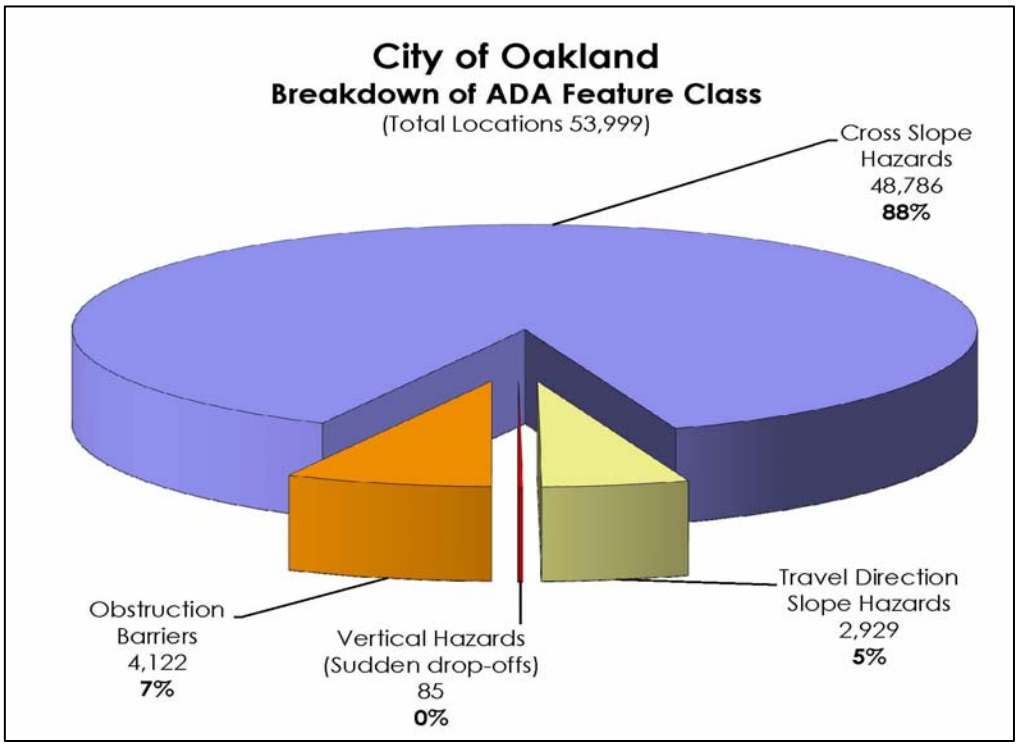


Figure 12a: ADA collection details citywide

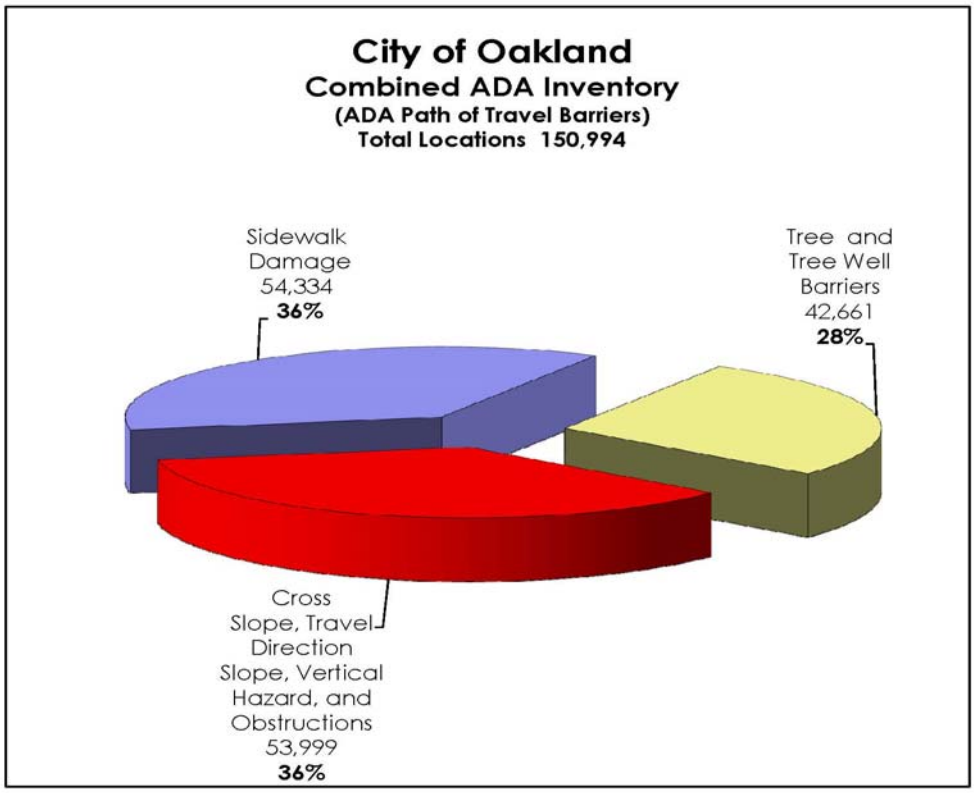


Figure 12b: Combined ADA Inventory

Curb Gutter Damage

The citywide inventory for Curb Damage found that there are **50,550** damage records. These records account for **329,567** linear feet of damage. "High" and "Very High" damage represents **44%** of this total.

The citywide inventory for Gutter Damage found that there are **9,036** damage records. These records account for **236,187** square feet of damage. "High" and "Very High" damage represents **29%** of this total.

Data collected citywide for this layer can be summarized as follows:

Table 7: Curb Gutter Damage details citywide

Damage Location Variables		Feature Count	Damage Area (SqFt)	Damage Length (Ft)	Percent of Total
Curb Damage	1 - Low	11,765	-	52,842	16%
	2 - Moderate	25,011	-	131,654	**40%**
	3 - High	10,040	-	70,616	21%
	4 - Very High	3,734	-	74,455	23%
Totals		50,550	-	329,567	100%
Gutter Damage	1 - Low	2,515	49,116	-	21%
	2 - Moderate	4,762	116,681	-	**49%**
	3 - High	1,436	57,560	-	24%
	4 - Very High	323	12,830	-	5%
Totals		9,036	236,187	-	100%

** Low Severity Curb and Gutter damage collection was terminated after the collection of Plan Areas 1, 2 and 4.*

** Only Gutter Damage contains values for Damage Area.*

** Percent of total is calculated using linear feet for Curb Damage and Damage Area for Gutter Damage, not by feature count.*

** Values in this table do not match values in Table 11 or the Curb / Gutter damage table in the appendix due to the fact that Severity Level 1 damage was removed from those tables.*

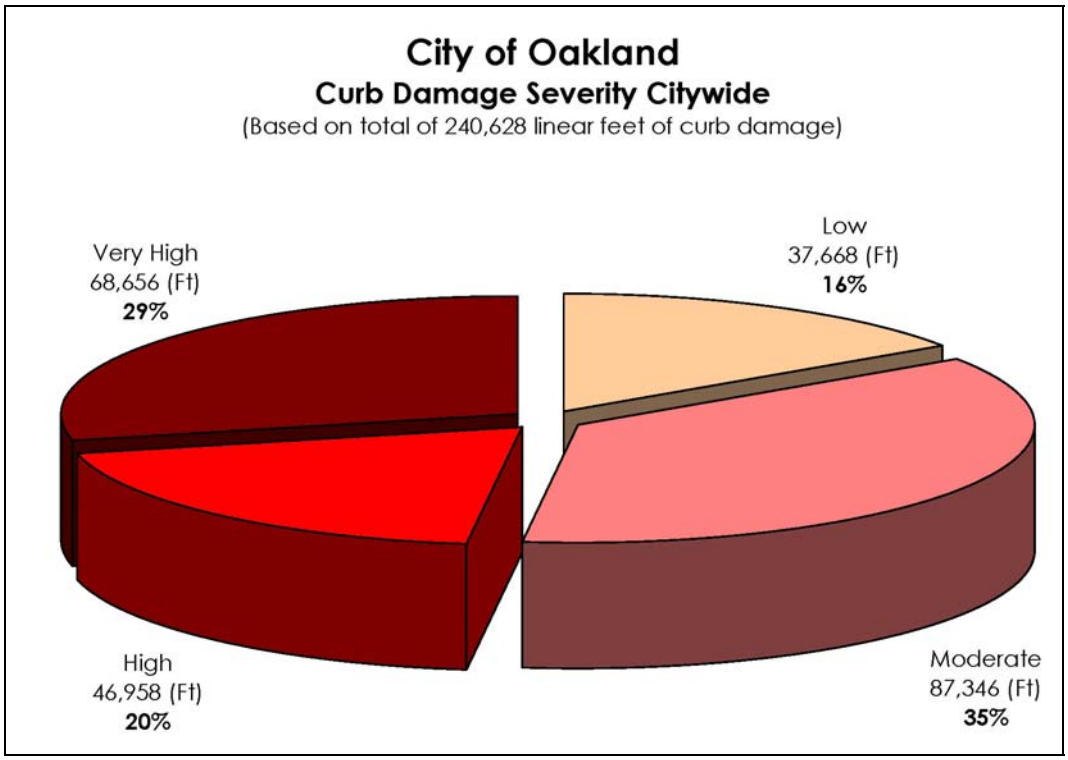


Figure 13: Curb Damage severity citywide

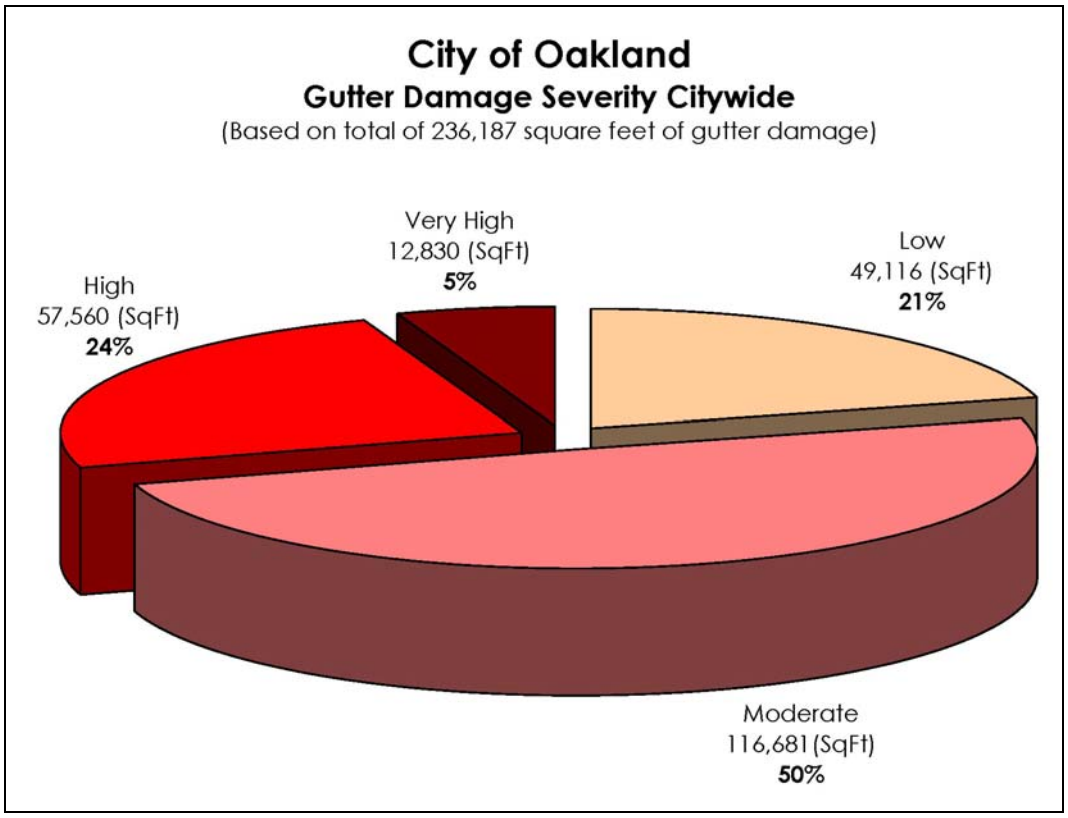


Figure 14: Gutter Damage severity citywide

- **Signs and Marking Condition**

The citywide inventory for Signs found that there are a total of **45,475** sign pole locations and **55,535** signs. These record counts are not the same due to the fact that more than one sign may reside on one pole location. Regulatory signs make up the majority of the locations with a total of **40,429** signs (**73%**).

Data collected citywide for this layer can be summarized as follows:

Table 8: Sign collection detail citywide

Sign Location Variables		Feature Count	Percent of Total
Sign Type	Regulatory	40,429	**73%**
	Street Sign	4,338	8%
	Caution	6,627	12%
	Temporary	1,480	3%
	Other	2,661	5%
Totals		55,535	100%
Condition	Good	33,421	**73%**
	Fair	5,372	12%
	Poor	6,682	15%
Totals		45,475	100%
Pole Type	Metal	38,554	**85%**
	Wood	1,586	3%
	Other	101	0%
	St. Light	4,390	10%
	Traffic Sig.	844	2%
Totals		45,475	100%
Total Number of Sign Locations (Poles)		45,475	
Total Number of Signs		**55,535**	

** One sign pole location can have up to three signs attached to it. Therefore, the total number of signs are not equal to the total number of sign pole locations.*

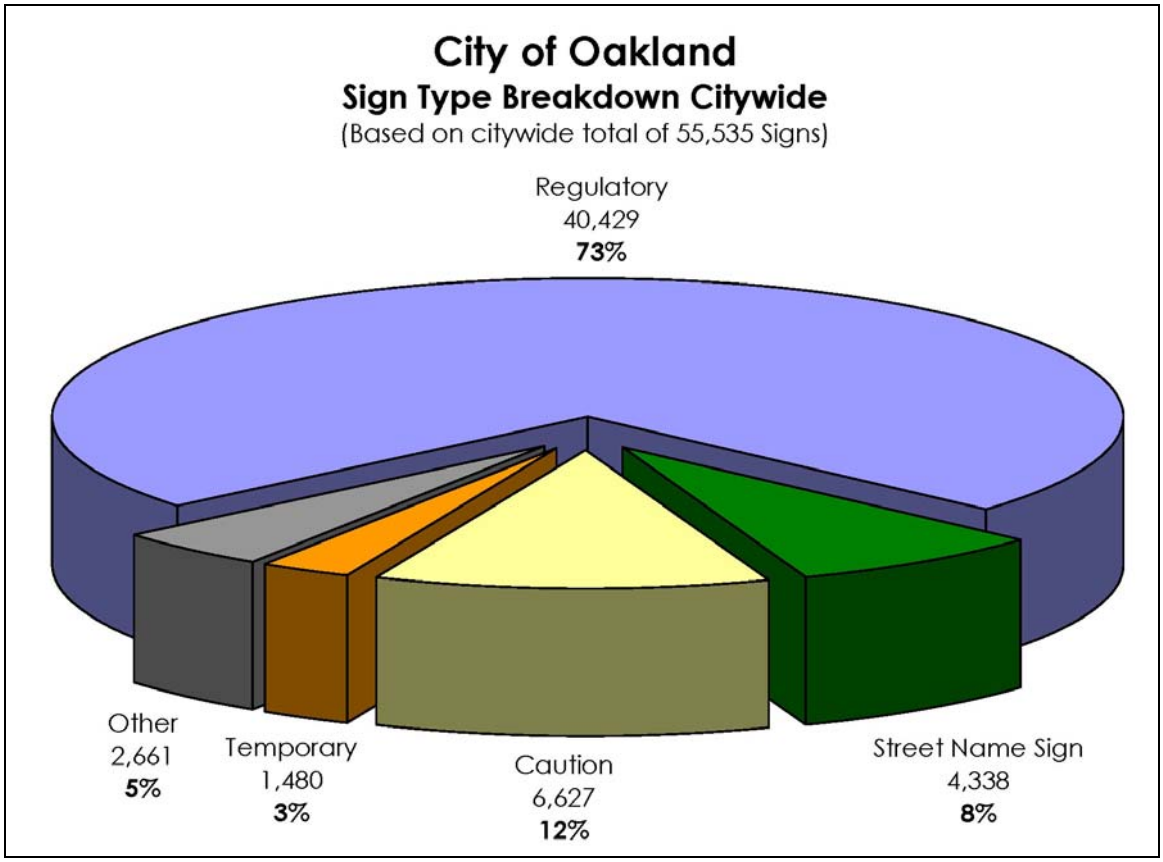


Figure 15: Sign type breakdown citywide

- **Bus Stops**

The citywide inventory for Bus Stops found that there are a total of **1665** Bus Stop locations. Of these locations, **498** have Benches and **126** have Bus Shelters.

Data collected citywide for this layer can be summarized as follows:

Bus Stop Location Variables		Feature Count	Percent of Total
Bus Stop	**Total Locations**	**1,665**	100%
	Bench	498	30%
	Shelter	126	8%
Pole Type	Metal	1,649	99%
	Wood	8	0%
	Other	8	0%

Table 9: Bus Stop collection details citywide

Cost Implications

This inventory gives the City valuable information to help PWA continue to build upon it existing maintenance program. It will assist in forming a comprehensive plan for managing repairs, removing ADA barriers, replacing problem trees, etc.

This data enables the City Public Works Agency to visually review database damage photos from the office prior to sending crews to the field for better planning of repairs on a priority schedule, or "worst first" scenario in which "High," and "Very High" damage could be repaired first, thus reducing the City's exposure to litigation from trip fall accidents.

The Public Works Agency's historical records indicate an average "cost to repair" figure of **$10/S.F.** for typical sidewalk damage, but **$16/S.F.** for damage where tree roots are the cause. The city has found that repair of tree damage sidewalks historically is priced higher because of deeper excavation to assure roots have been totally removed. Cost Estimate on the following page separates the two, to derive a cost for each, which means breaking tree damage from the overall **7,248,747 S.F.** damage figure.

Please note that the Scope of Work only asked for cost estimates for Sidewalk, Curb and Gutter damage. See tables on following page for detailed council district breakdown of both Sidewalk Repair and Curb/Gutter repair cost estimates.

Estimated Cost for Sidewalk Repair					
District	Private Damage Old Age, Sewer or Utility (SF)	Private Damage $10/SF	Tree Damage (SF)	Tree Damage $16/SF	Total Estimated Cost $
1	964,440	$9,644,400	321,275	$5,140,400	$14,784,800
2	808,517	$8,085,170	155,136	$2,482,176	$10,567,346
3	856,696	$8,566,960	128,058	$2,048,928	$10,615,888
4	678,933	$6,789,330	176,058	$2,816,928	$9,606,258
5	720,893	$7,208,930	111,345	$1,781,520	$8,990,450
6	866,357	$8,663,570	165,996	$2,655,936	$11,319,506
7	1,115,462	$11,154,620	179,581	$2,873,296	$14,027,916
Totals	**6,011,298**	**$60,112,980**	**1,237,449**	**$19,799,184**	**Total**
Cost Totals	**$60,112,980**		**$19,799,184**		**$79,912,164**

Note: Damage Cost is based on the City PWA historical finding of $10/SF
Estimate cost per location for trees is also a historical figure of $16/SF

Table 10: Sidewalk Damage Cost Estimate

Sidewalk Damage = $ 60,112,980

Sidewalk Damage caused by Trees = $19,799,184

Total = **$79,912,164**

Table 11: Curb & Gutter Damage Cost Estimate

Estimated Cost Curb / Gutter					
District	Curb Damage Linear Feet	Estimated Cost $20/LF	Gutter Damage Square Feet	Estimated Cost $10/SF	Total Estimated Cost $
1	40,737	$814,740	37,537	$375,370	$1,190,110
2	37,064	$741,280	20,241	$202,410	$943,690
3	53,042	$1,060,840	42,131	$421,310	$1,482,150
4	28,946	$578,920	20,227	$202,270	$781,190
5	36,802	$736,040	16,352	$163,520	$899,560
6	25,481	$509,620	14,018	$140,180	$649,800
7	54,653	$1,093,060	36,516	$365,160	$1,458,220
Totals	**276,725**	**$5,534,500**	**187,022**	**$1,870,220**	**$7,404,720**
Cost Totals	**$5,534,500**		**$1,870,220**		

Note: Curb Damage Cost is based on the City PWA historical findings of $20/SF
Gutter Damage Cost is also a historical figure of $11/SF

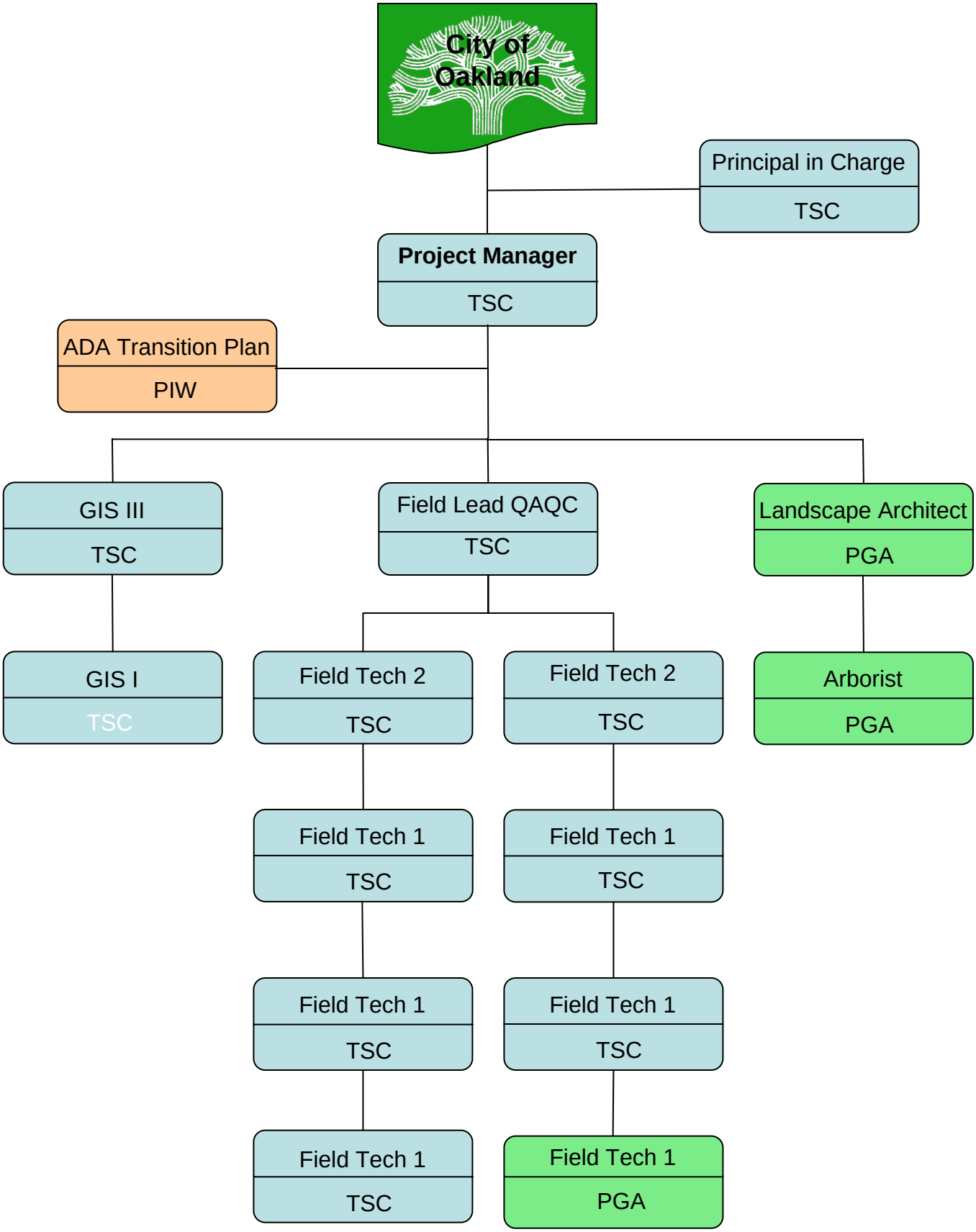
Curb/Gutter Damage = **$7,404,720**

Realistically, the City will probably choose to first address the "High" and "Very High" damage locations for repair first. Then address future repairs in order of importance. The cost total is significant, yet a phased approach over a period of years will make the sidewalk repair process more manageable, and less daunting financial undertaking.

Total Sidewalk/Curb/Gutter Damage is estimated to be: $87,316,884

Appendices

Team Organization Chart



Metadata Master Plan (MMP): Oakland Sidewalk/ADA Inventory

Primary Category	Secondary Category	Field Name	Order	Type	Width	Choices	Default	Explanation	Answer
Sidewalk Segment	All	SegmentID	1	C	10	AutoPop		Unique ID	From Selected Segment
Sidewalk Segment	All	PlanAreaID	2	C	7	AutoPop		Plan Area the segment is in	From Selected Segment
Sidewalk Segment	All	CouncilDistrict	3	C	12	AutoPop		Council District of Segment	From Selected Segment
Sidewalk Segment	All	Surveyor	4	C	12	Select	Last Selected	Inventory Personel	Varies
Sidewalk Segment	All	CollectionDate	5	D	8	Select	Last Selected	Date of Inventory dd/mm/yy	Varies dd/mm/yy
Sidewalk Segment	Sidewalk Damage	Length	6	I	10	AutoPop		Sidewalk Length	From Selected Segment
Sidewalk Segment	ADA	Width	7	I	2	Select	Clear out form	Sidewalk Width	Varies
Sidewalk Segment	Sidewalk Damage	SidewalkArea	8	I	10	Select		Total area of sidewalk Total Lenth * Width	Varies
Sidewalk Segment	Curb/Gutter Damage	GutterWidth	9	I	3	Select	Clear out form	Width of Gutter	Varies
Sidewalk Segment	ADA	ADA_Compli	10	L	1	Select	0	Is segment ADA Compliant	0 / -1
Sidewalk Segment	ADA	Landuse	11	C	6	Pulldown	Clear out form	Landuse	Res/Com/EssFac
Sidewalk Segment	None	Length2	12	I	10	Select		Lenth of segment if greater then lengh from GIS	From length field of Selected Segment
Sidewalk Segment	None	CurbType	13	C	6	Pulldown	Clear out form	Type of Curb	A/B/C/Rolled/None
Sidewalk Segment	None	Paved	14	L	1	Checkbox	0	Is Gutter Paved over?	0 / -1
Sidewalk DamageLin	All	SegmentID	1	C	10	AutoPop		Unique ID	From Selected Segment
Sidewalk DamageLin	All	PlanAreaID	2	C	7	AutoPop		Plan Area the segment is in	From Selected Segment
Sidewalk DamageLin	All	CouncilDistrict	3	C	12	AutoPop		Council District of Segment	From Selected Segment
Sidewalk DamageLin	All	Surveyor	4	C	12	Select	Last Selected	Inventory Personel	Varies
Sidewalk DamageLin	All	CollectionDate	5	D	8	Select	Last Selected	Date of Inventory dd/mm/yy	Varies dd/mm/yy
Sidewalk DamageLin	None	DamageType	6	C	7	Pulldown	Clear out form	Type of Sidewalk Damage	Fault/Uplift/Dep/Crack/Uttility/Other
Sidewalk DamageLin	ADA	Severity	7	I	1	Pulldown	Clear out form	Severity of Damage, **1** = >1/4"-<1/2" **/ 2** = >1/2"-<1 1/2" **/ 3** = >1 1/2" - < 3" **/ 4** = > 3"	1/2/3/4
Sidewalk DamageLin	None	StartLoc	8	I	5	Select	Clear out form	Start location of damage	Varies
Sidewalk DamageLin	None	EndLoc	9	I	5	Select	Clear out form	End location of damage	Varies
Sidewalk DamageLin	None	DamageLen	10	I	5	AutoPop		Lengeth of damage. Range of start and end damage.	Varies
Sidewalk DamageLin	Sidewalk Segment	Width	11	I	3	Select	Clear out form	Sidewalk Width	Varies
Sidewalk DamageLin	ADA	DamageArea	12	I	6	AutoPop		Total area of sidewalk damage, DamageLen * Width	Varies
Sidewalk DamageLin	None	PhotoID	13	C	4	AutoPop		ID of Photo	Vaires
Sidewalk DamageLin	None	Respons	14	C	7	Pulldown	Other	Cause of Damage	Tree/Utility/Sewer/Other
Sidewalk DamageLin	ADA	ADA_TravW	15	L	1	Checkbox	0	Does damage fall within 36" path of travel?	0 / -1
Sidewalk DamageLin	ADA	SurfType	16	C	7	Dropdown	Conc	Surface Type	Conc/Pavers/Asphalt/Other
Sidewalk DamageLin	None	OnDriveway	17	C	7	Dropdown	Clear out form	Is dameage on sidewalk or driveway	0 / -1
Sidewalk DamageLin	None	PrelimRep	18	C	9	Checkbox	0	Has the area been Prelimimay Repaired	0 / -1
Curb/Gutter Damage	All	SegmentID	1	C	10	AutoPop		Unique ID	From Selected Segment
Curb/Gutter Damage	All	PlanAreaID	2	C	7	AutoPop		Plan Area the segment is in	From Selected Segment
Curb/Gutter Damage	All	CouncilDistrict	3	C	12	AutoPop		Council District of Segment	From Selected Segment
Curb/Gutter Damage	All	Surveyor	4	C	12	Select	Last Selected	Inventory Personel	Varies
Curb/Gutter Damage	All	CollectionDate	5	D	8	Select	Last Selected	Date of Inventory dd/mm/yy	Varies dd/mm/yy
Curb/Gutter Damage	None	Severity	7	I	1	Pulldown	Clear out form	Severity of Damage, >1/4"-<1/2" / >1/2"-<1 1/2" / >1 1/2" - < 3" / > 3"	1/2/3/4
Curb/Gutter Damage	None	StartLoc	8	I	5	Select	Clear out form	Start location of damage	Varies
Curb/Gutter Damage	None	EndLoc	9	I	5	Select	Clear out form	End location of damage	Varies
Curb/Gutter Damage	None	DamageLen	10	I	5	AutoPop		Length of damage. Range of start and end damage.	Varies
Curb/Gutter Damage	Sidewalk Segment	GutterWidth	11	I	3	AutoPop	0	Width of Gutter	Varies
Curb/Gutter Damage	None	DamageArea	12	I	6	AutoPop		Area of gutter damage. DamageLen * GutterWidth	Varies
Curb/Gutter Damage	None	Ponding	13	L	1	Checkbox	Clear out form	Is there Ponding?	0 / -1
Curb/Gutter Damage	None	CutbIron	14	L	1	Checkbox	Clear out form	Is there a Curb Iron?	0 / -1

Metadata Master Plan (MMP): Oakland Sidewalk/ADA Inventory

Primary Category	Secondary Category	Field Name	Order	Type	Width	Choices	Default	Explanation	Answer
Curb/Gutter Damage	ADA	Respons	15	C	7	Dropdown	Clear out form	Cause of Damage	Tree / Utility / Sewer / No Curb / Other
Curb/Gutter Damage	None	SurfaceType	16	C	7	Dropdown	Conc	Surface Type	Conc / Pavers / Asphalt / Other
Cub/Gutter Damage	None	Offset	17	C	5	Dropdown	Last Selected	Direction of offset	Right / Left
Tree	All	SegmentID	1	C	10	AutoPop		Unique ID	From Selected Segment
Tree	All	PlanAreaID	2	C	7	AutoPop		Plan Area the segment is in	From Selected Segment
Tree	All	CouncilDistrict	3	C	12	AutoPop		Council District of Segment	From Selected Segment
Tree	All	Surveyor	4	C	12	Select	Last Selected	Inventory Personel	Varies
Tree	All	CollectionDate	5	D	8	Select	Last Selected	Date of Inventory dd/mm/yy	Varies dd/mm/yy
Tree	All	Location	6	I	4	Select	Clear out form	Location of Tree (Ft.)	Varies
Tree	None	Tree	7	L	1	Select	0	Is there a Tree?	0 / -1
Tree	None	Well	8	L	1	Select	0	Is there a Well?	0 / -1
Tree	None	WellWidth	9	I	2	Select	0	Width of Well	Varies / 0
Tree	None	WellLength	10	I	2	Select	0	Length of Well	Varies / 0
Tree	None	PAreaWidth	11	1		Select	0	Width of planting area	Varies / 0
Tree	ADA	LowWell	12	L	1	Select	None	Is dirt in well lower then surface of sidewalk? Low = > 1/4" - < 1", Medium = >1" - < 3", High = > 3"	Low / Med / High / None /
Tree	None	HVW	13	L	1	Select	0	Are there High Voltage Wires above empty well	0 / -1
Tree	None	Stump	14	L	1	Checkbox	0	There is a tree stump	0 / -1
Tree	None	BrokenHangingLimb	17	L	1	Checkbox	0	Limb is broken or hanging	0 / -1
Tree	None	OpenCavity	18	L	1	Checkbox	0	Open Cavity in tree	0 / -1
Tree	None	StructureCont	19	L	1	Checkbox	0	Tree is contacting structure	0 / -1
Tree	ADA	LowLimbs	20	C	10	Dropdown	None	Are low limbs over the sidewalk or over the street?	Sidewalk / Street / None
Tree	ADA	TrunkLean	21	C	10	Dropdown	None	Is trunk leaning over sidewalk or over the street?	Sidewalk / Street / None
Tree	None	Species	22	C	15	Select	TBD	Species of collected tree	To be determined
Tree	None	WaterMet	23	L	1	Checkbox	0	There is a water meter <5' from well	0 / -1
Tree	None	FireHyd	24	L	1	Checkbox	0	There is a fire hydrant <5' from well	0 / -1
Tree	None	Driveway	25	L	1	Checkbox	0	There is a driveway <5' from well	0 / -1
Tree	None	LightPole	26	L	1	Checkbox	0	There is a ligth pole <15" from well	0 / -1
Tree	None	StreetCorner	27	L	1	Checkbox	0	There is a Street Corner <15 from well	0 / -1
Tree	None	TrunkDiam	28	C	7	Dropdown	None	Small = < 5" / Medium = 5"-10" / Large = 10"-20" X-Large = 20"-30" / XX-Large = >30"	Sm / Med / Large / XL / XXL / None
Tree	ADA	Grate	29	L	1	Select	None	Is there a grate and is it flush or a trip hazard?	FlushGrate / TripGrate / None
Tree	None	Stake/Guard	30	L	1	Select	0	Is there a stake or Guard	0 / -1
Bus Stop	All	SegmentID	1	C	10	AutoPop		Unique ID	From Selected Segment
Bus Stop	All	PlanAreaID	2	C	7	AutoPop		Plan Area the segment is in	From Selected Segment
Bus Stop	All	CouncilDistrict	3	C	12	AutoPop		Council District of Segment	From Selected Segment
Bus Stop	All	Surveyor	4	C	12	Select	Last Selected	Inventory Personel	Varies
Bus Stop	All	CollectionDate	5	D	8	Select	Last Selected	Date of Inventory dd/mm/yy	Varies dd/mm/yy
Bus Stop	None	Location	6	I	4	Select	Clear out form	Location of Bus Stop (Ft)	Varies
Bus Stop	None	PoleType	7	C	7	Select	Clear out form	Type of material Pole is made out of	Wood, Metal
Bus Stop	None	Bench	8	L	1	Select	0	Is there a Bench	0 / -1
Bus Stop	None	Shelter	9	L	1	Select	0	Is there a Shelter	0 / -1
Bus Stop	None	Length	11	I	3	Select	0	Length of concrete pad	Varies / 0
Bus Stop	None	Width	12	I	3	Select	0	Width of concrete pad	Varies / 0
ADA	All	SegmentID	1	C	10	AutoPop		Unique ID	From Selected Segment
ADA	All	PlanAreaID	2	C	7	AutoPop		Plan Area the segment is in	From Selected Segment
ADA	All	CouncilDistrict	3	C	12	AutoPop		Council District of Segment	From Selected Segment
ADA	All	Surveyor	4	C	12	Select	Last Selected	Inventory Personel	Varies
ADA	All	CollectionDate	5	D	8	Select	Last Selected	Date of Inventory dd/mm/yy	Varies dd/mm/yy

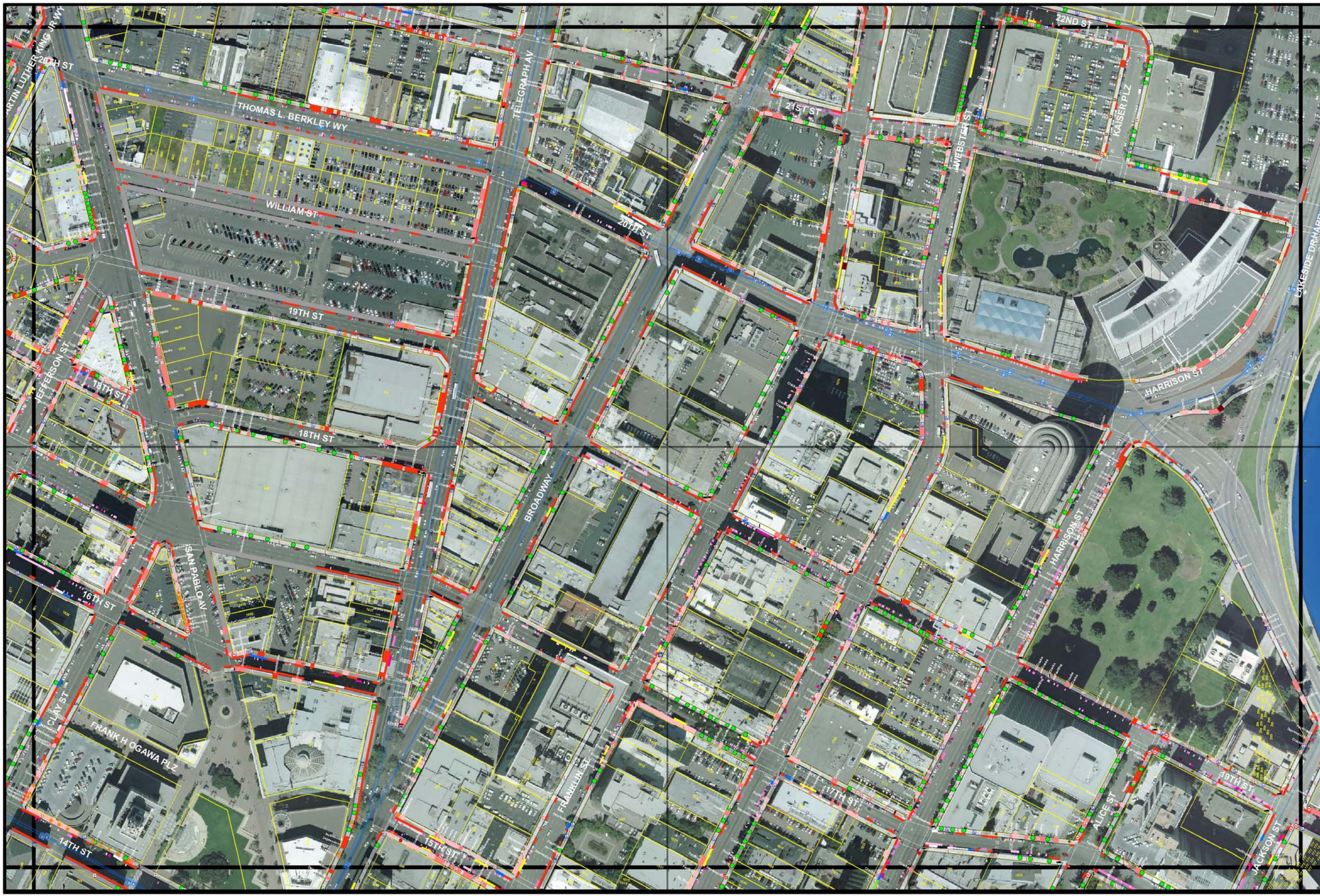
Metadata Master Plan (MMP): Oakland Sidewalk/ADA Inventory

Primary Category	Secondary Category	Field Name	Order	Type	Width	Choices	Default	Explanation	Answer
ADA	All	Location	6	I	4	Select	Clear out form	Location of ADA Concern	Varies
ADA	None	TransObst	7	C	15	Dropdown	None	Any feature obstructing the 36" Travel Way	TraffSigPole / BikeRack / BusShelter / BusBench / ParkingMeter / None / Other
ADA	None	ComObst	8	C	15	Dropdown	None	Any feature obstructing the 36" Travel Way	CaféSeating / VendorStand / None / Other
ADA	None	OtherObst	9	C	15	Dropdown	None	Any feature obstructing the 36" Travel Way	UtilPole / SignPole / FireHyd / MailBox / NewsBox / Vegetation / PublicPhone / TempSign / Tree/Planter / ParkedVeh / OverheadObst / None / Other
ADA	None	SlopeCS	10	C	15	Dropdown	None	Is cross slope>2 - 5%, >5% or Driveway ?	>2 -5% / >5% / Driveway / None
ADA	None	SlopeTD	11	C	15	Dropdown	None	Is travel direction slope greater than >5 - 8.33% or >8.33% ?	>5 - 8.33% / >8.33% / None
ADA	None	VerticalHaz	12	C	15	Dropdown	None	ADA concern not related to obstructions or slope	SudDropOff / None
Signs	All	SegmentID	1	C	10	AutoPop		Unique ID	From Selected Segment
Signs	All	PlanAreaID	2	C	7	AutoPop		Plan Area the segment is in	From Selected Segment
Signs	All	CouncilDistrict	3	C	12	AutoPop		Council District of Segment	From Selected Segment
Signs	All	Surveyor	4	C	12	Select	Last Selected	Inventory Personel	Varies
Signs	All	CollectionDate	5	D	8	Select	Last Selected	Date of Inventory dd/mm/yy	Varies dd/mm/yy
Signs	None	Location	6	I	4	Select	Clear out form	Location of Sign	Varies

Metadata Master Plan (MMP): Oakland Sidewalk/ADA Inventory

Primary Category	Secondary Category	Field Name	Order	Type	Width	Choices	Default	Explanation	Answer
Signs	None	SignType	9	C	12	Dropdown?	None	Type of Street Sign	None / R1-1 / R1-2 / R1-2a / R1-3 / R1-4 / R1-5a / R2-1 / R2-4 / R3(CA) / R3-1 / R3-2 / R3-3 / R3-4 / R3-5 / R3-5a / R3-6 / R3-7 / R3-8 / R3-8a / R3-8b / R3-9a / R3-18 / R4-1 / R4-3 / R4-5 / R4-6 / R4-7 / R4-7a / R4-7b / R4-8 / R5-1 / R5-1a / R5-2 / R5-6 / R5-10C / R6-1 / R6-2 / R7-6 / R7-7 / R7-8b / R7-9 / R7-107 / R7-201 / R7-201a / R7-202 / R8-3a / R8-3c / R8-3d / R8-4 / R8-8 / R9-2 / R9-3 / R9-3a / R9-3b / R10-3 / R10-4 / R10-4b / R10-6 / R10-7 / R10-11 / R10-12 / R10-15 / R11-2 / R12-1 / R12-5 / R13A(CA) / R13B(CA) / R14-1 / R15-1 / R15-2 / R20A(CA) / R20D-1(CA) / R20D-2(CA) / R20D-3(CA) / R20D-4(CA) / R20H(CA) / R20-1(CA) / R21(CA) / R24(CA) / R25(CA) / R26(CA) / R26A(CA) / R26A(S)(CA) / R26B(CA) / R26F(CA) / R26J(CA) / R26(S)(CA) / R27(CA) / R28(CA) / R28A(CA) / R28A(S)(CA) / R28B(CA) / R28(S)(CA) / R29(CA) / R30(CA) / R30A(CA) / R31(CA) / R31(S)(CA) / R32(CA) / R32A(CA) / R32B(CA) / R33(CA) / R33A(CA) / R33B(CA) / R33C(CA) / R36(CA) / R37(CA) / R38(CA) / R38(S)(CA) / R40(CA) / R44A(CA) / R44B(CA) / R44C(CA) / R47(CA) / R48(CA) / R48-1(CA) / R4
Signs	None	Pole Type	10	C	10	Dropdown	Clear out form	Material Pole is made from	Wood / Metal / StreetLgt / TraffSig / Other
Signs	None	Condition	11	C	4	Dropdown	Clear out form	Condition of Sign	Good / Fair / Poor
ParkingRest	All	SegmentID	1	C	10	AutoPop		Unique ID	From Selected Segment
ParkingRest	All	PlanAreaID	2	C	7	AutoPop		Plan Area the segment is in	From Selected Segment
ParkingRest	All	CouncilDistrict	3	C	12	AutoPop		Council District of Segment	From Selected Segment
ParkingRest	All	Surveyor	4	C	12	Select	Last Selected	Inventory Personel	Varies
ParkingRest	All	CollectionDate	5	D	8	Select	Last Selected	Date of Inventory dd/mm/yy	Varies dd/mm/yy
ParkingRest	None	Color	6	C	6	Dropdown	Last Selected	Color of curb	Red / White / Yellow / Blue / Green / Other
ParkingRest	None	StartLoc	7	I	4	Select	Clear out form	Start location of Parking Restriction	Varies
ParkingRest	None	EndLoc	8	I	4	Select	Clear out form	End location of Parking Restriction	Varies
ParkingRest	None	RestLen	9	I	4	AutoPop		Total Length of Colored Curb	Varies
ParkingRest	None	Offset	10	C	5	Dropdown	Last Selected	Offset Direction	Left / Right

Key:	KeyCode	Example
Character (abc,#)	C	Area1
Date	D	dd/mm/yy
Logical	L	Y/N
Integer	I	126



CITY OF OAKLAND

PUBLIC WORKS AGENCY

ENGINEERING DESIGN AND RIGHT OF WAY MANAGEMENT DIVISION

CITYWIDE SIDEWALK CONDITION/ ADA SURVEY

PROJECT NO. C250110

Legend

ADA Occurances
- Cross Slope 2-5%
- Cross Slope >5%
- TD Slope 5-8%
- TD Slope >8.33%
- Com Obstruction
- Other Obstruction
- Trans Obstruction
- Sudden Drop Off

Pubic Transit
- Bus Route
- Bus Stops

Curb and Gutter Damage Severity
- 1 - Low
- 2 - Moderate
- 3 - High
- 4- Very High

Parking Restrictions
- Blue Curb
- Green Curb
- Other Color
- Red Curb
- White Curb
- Yellow Curb

Sidewalk Damage Severity
- 0 - No Sidewalk Construction
- 1 - Low
- 2 - Moderate
- 3 - High
- 4 - Very High

Signs (Common)
- Stop Sign
- Yield
- Parking Restriction
- Warning Sign
- Street Name Sign

Trees
- Tree
- Tree Well Only

SCALE: 1 IN = 100FT

DATE: MAR 5, 2007

50 SCALE MAP GRID

A	B
C	D

SHEET NUMBER

221

CITY OF OAKLAND

PUBLIC WORKS AGENCY

ENGINEERING DESIGN AND RIGHT OF WAY MANAGEMENT DIVISION

CITYWIDE SIDEWALK CONDITION/ ADA SURVEY

PROJECT NO. C250110

Legend

ADA Occurances

- Cross Slope 2-5%
- Cross Slope >5%
- TD Slope 5-8%
- TD Slope >8.33%
- Com Obstruction
- Other Obstruction
- Trans Obstruction
- Sudden Drop Off

Pubic Transit

- Bus Route
- Bus Stops

Curb and Gutter Damage Severity

- 1 - Low
- 2 - Moderate
- 3 - High
- 4- Very High

Parking Restrictions

- Blue Curb
- Green Curb
- Other Color
- Red Curb
- White Curb
- Yellow Curb

Sidewalk Damage Severity

- 0 - No Sidewalk Construction
- 1 - Low
- 2 - Moderate
- 3 - High
- 4 - Very High

Signs (Common)

- Stop Sign
- Yield
- Parking Restriction
- Warning Sign
- Street Name Sign

Trees

- Tree
- Tree Well Only

SCALE: 1 IN = 50FT

DATE: MAR 5, 2007

50 SCALE MAP GRID

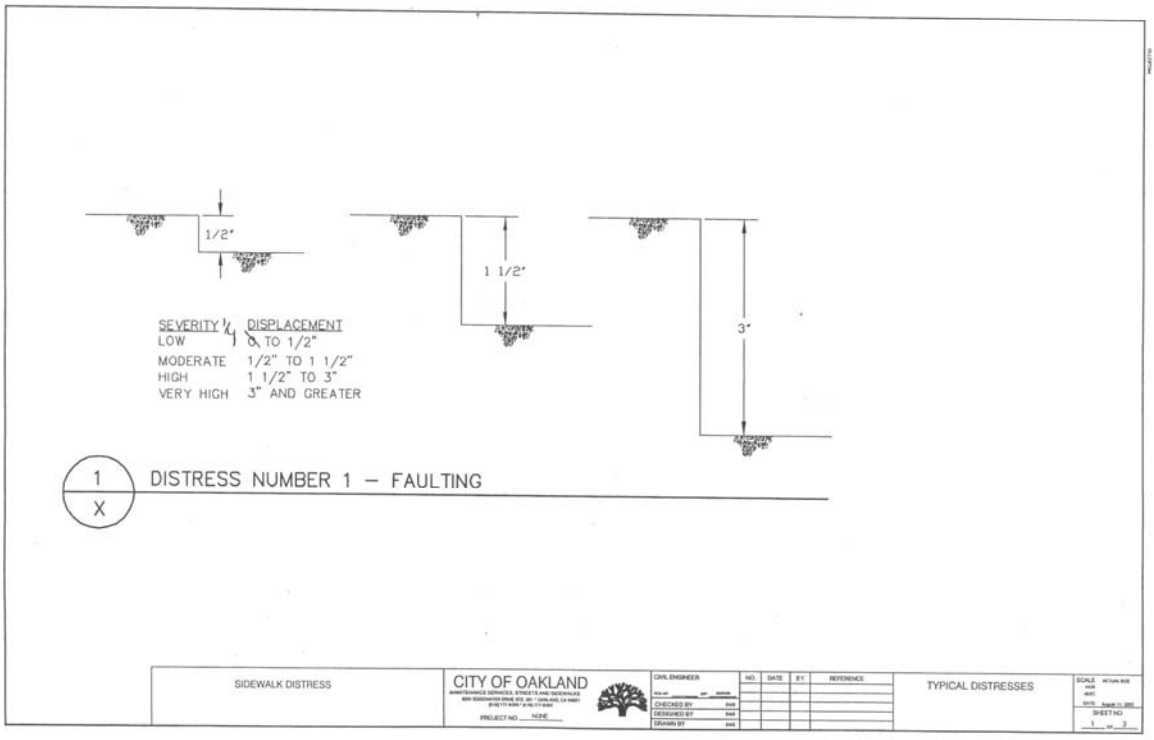
A	B
C	D

SHEET NUMBER

221D

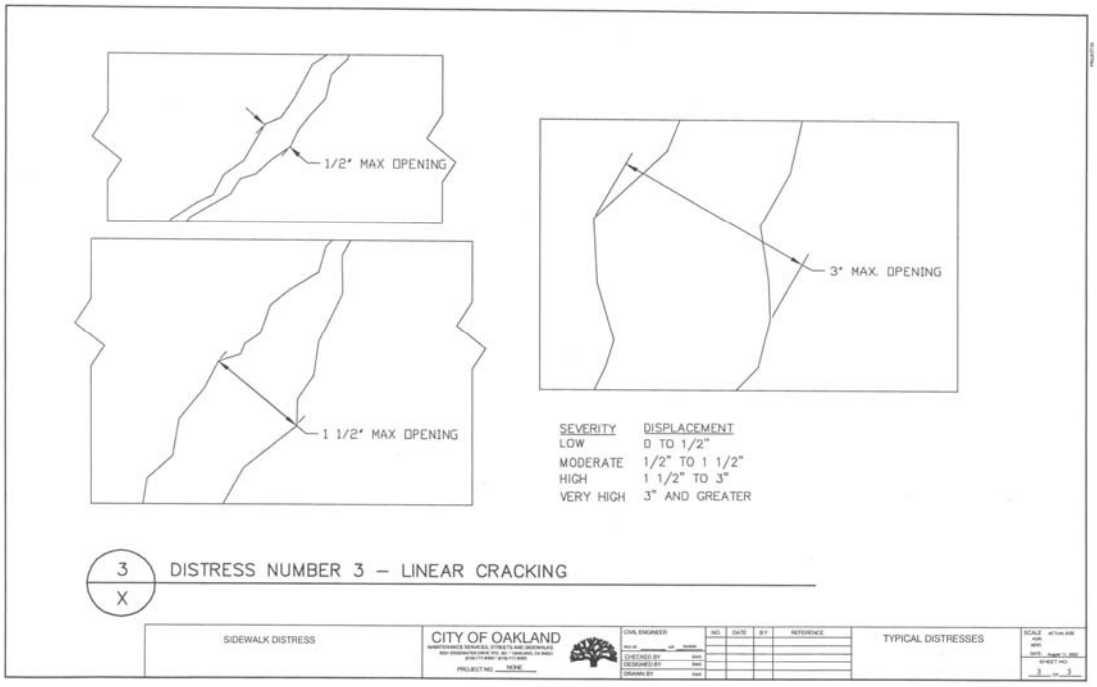
Faulting

City of Oakland Sidewalk Inventory



Linear Cracking

City of Oakland Sidewalk Inventory

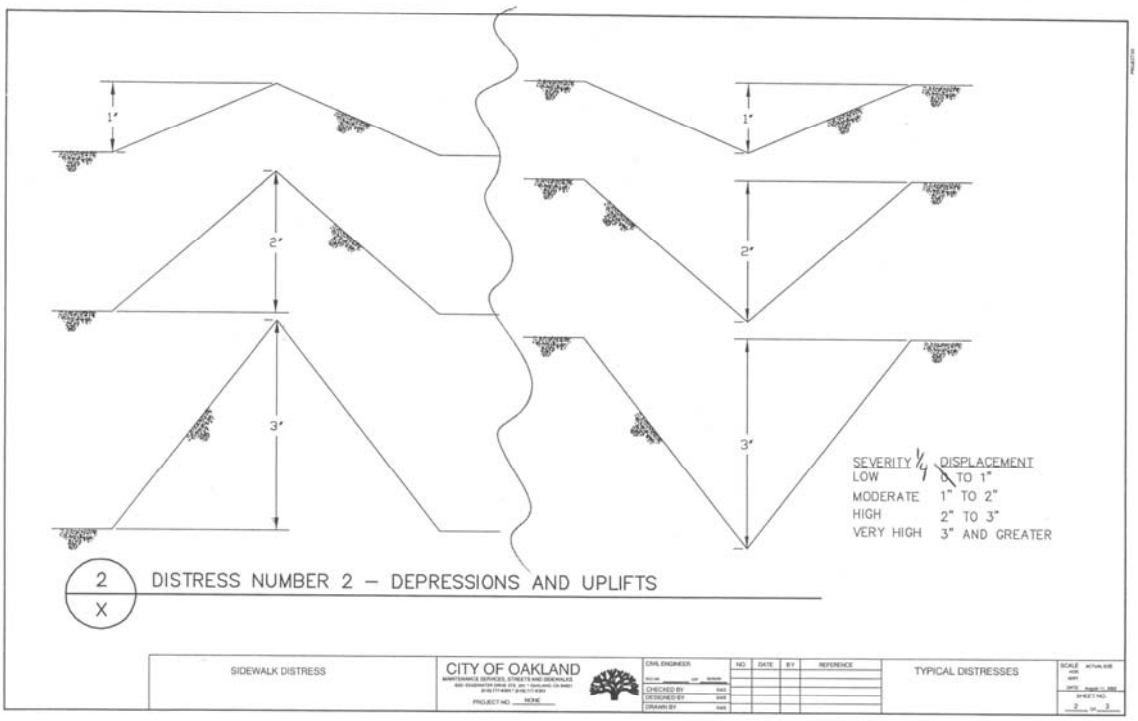


Curb / Gutter Damage

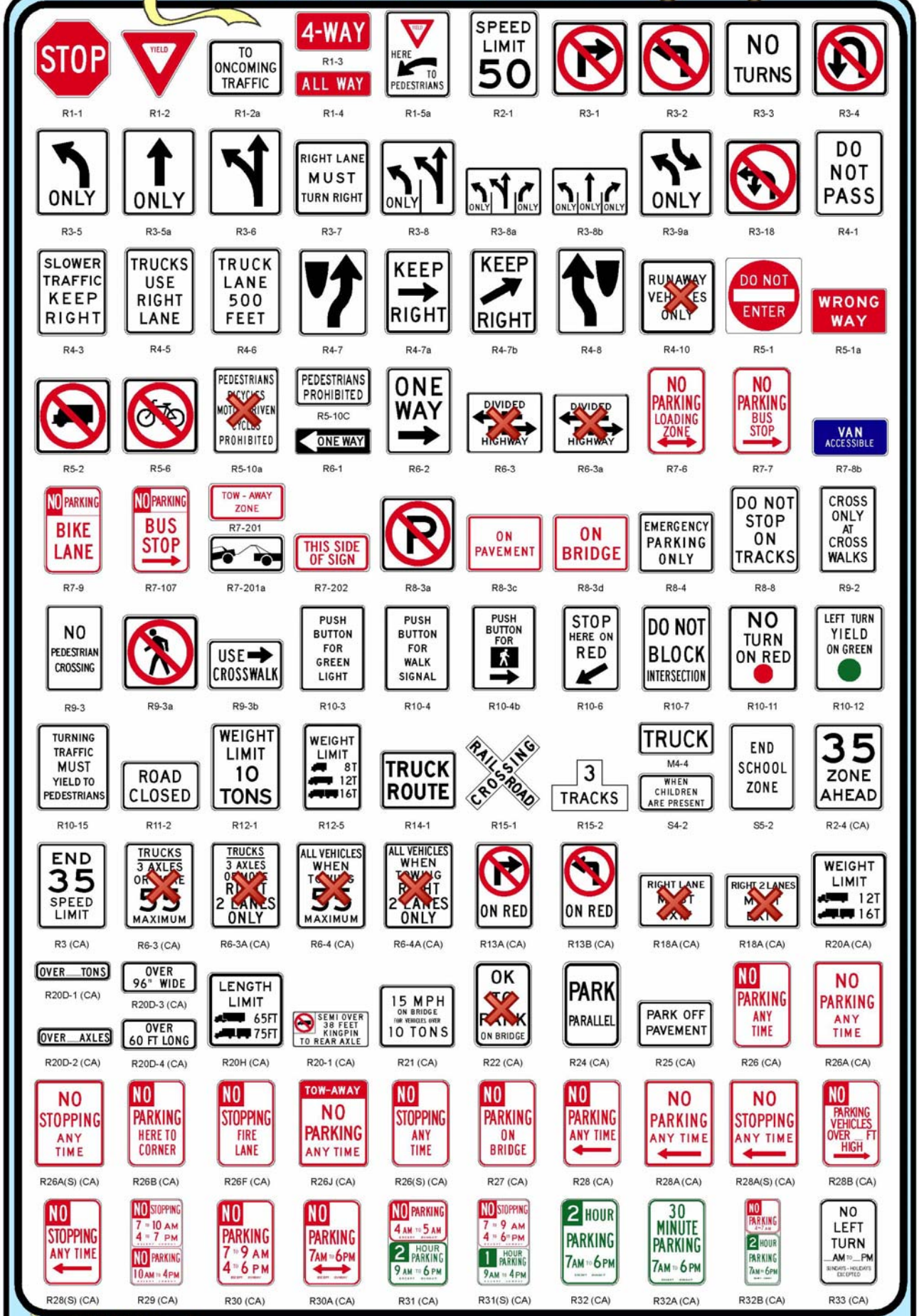
City of Oakland Sidewalk Inventory

Depressions and Uplifts

City of Oakland Sidewalk Inventory



California 2004 Uniform Sign Chart

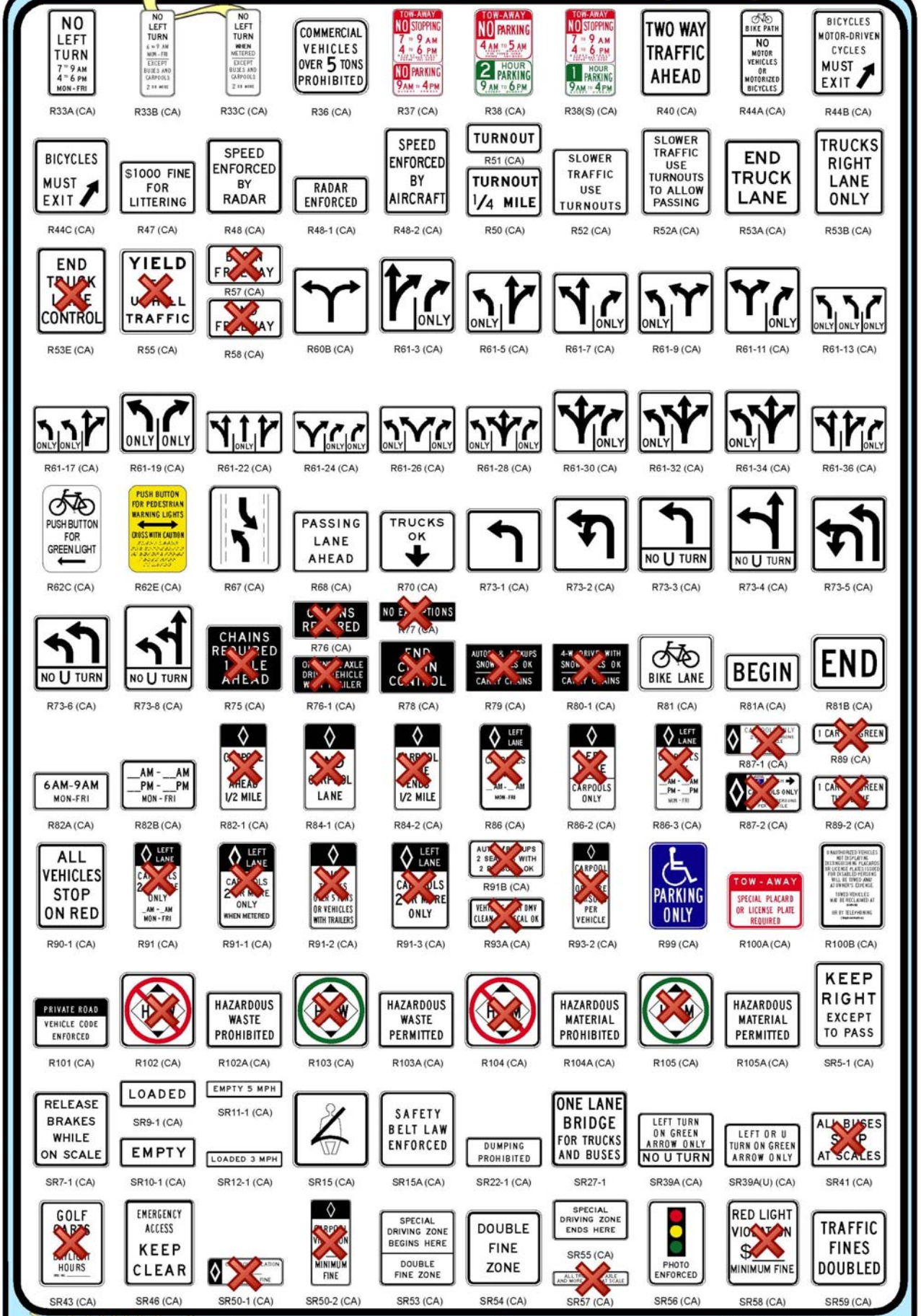


Regulatory Signs 1 of 2

Note: California codes are designated by (CA). Otherwise Federal codes shown.

California Department of Transportation
Signs and Work Zones Branch
November 2004
www.dot.ca.gov/hq/traffops/signtech/signdel/index.htm

California 2004 Uniform Sign Chart



Regulatory Signs 2 of 2

Note: California codes are designated by (CA). Otherwise Federal codes shown.

California Department of Transportation
Signs and Work Zones Branch
November 2004
www.dot.ca.gov/hq/traffops/signtech/signdel/index.htm

Citywide Tree Species List

Species Name	Species Count
Abies sp	2
Acacia baileyana	16
Acacia longifolia	68
Acacia melanoxylon	146
Acacia sp	35
Acer buergeranum	22
Acer macrophyllum	46
Acer negundo	2
Acer palmatum	133
Acer rubrum	76
Acer saccharinum	4
Acer sp	971
Aesculus californica	5
Aesculus carnea	68
Agave sp	3
Agonis flexuosa	14
Ailanthus altissima	2
Albizia julibrissin	171
Almond tree	5
Alnus rhombifolia	64
Alnus sp	52
Apricot tree	2
Araucaria sp	19
Arbutus sp	74
Banana	1
Bauhinia	1
Betula pendula	56
Betula sp	232
Bonsai	2
Brachychiton populneum	6
Callistemon sp	243
Calocedrus decurrens	4
Camellia sp	2
Carpinus sp	34
Casuarina sp	4
Catalpa sp	18
Cedrus deodara	2

Cedrus sp	67
Celtis sp	567
Ceratonia siliqua	156
Cercis sp	421
Chamaerops humilus	2
Cinnamomum camphora	522
Citrus sp	50
Cordyline australis	189
Cornus sp	16
Cotinus coggyggria	2
Cotoneaster sp	8
Crataegus phaenopyrum	549
Crataegus sp	213
Cupressus sempervirens	109
Cupressus sp	152
Datura	3
Dead	452
Diospyros kaki	3
Dodonaea sp	41
Eriobotrya deflexa	23
Eriobotrya japonica	75
Eucalyptus citriodora	6
Eucalyptus ficifolia	52
Eucalyptus globulus	15
Eucalyptus nicholii	33
Eucalyptus polyanthemos	33
Eucalyptus pulverulenta	2
Eucalyptus sideroxylon Rosea	42
Eucalyptus sp	24
Fagus sylvatica	54
Feijoa sellowiana	2
Ficus benjamina	16
Ficus carica	13
Ficus retusa nitida	108
Fig Tree	9
Fraxinus o. `Raywood'	1327
Fraxinus sp	824
Fraxinus v. `Modesto'	10
Fruit tree	9
Geijera parvifolia	175
Ginkgo biloba	576
Gleditsia triacanthos	224

Grevillea robusta	121
Guava	3
Hoheria populnea	3
Hymenosporum flavum	2
Ilex sp	9
Jacaranda acutifolia	365
Juglans h. californica	17
Juniperus sp	46
Koelreuteria sp	111
Lagerstroemia indica	1953
Laurus nobilis	47
Laurus nobilis `Saratoga'	32
Leptospermum sp	3
Ligustrum japonicum	76
Ligustrum lucidum	42
Ligustrum sp	120
Liquidambar styraciflua	3312
Liriodendron tulipifera	71
Lophostemon confertus	632
Lyonothamnus asplinifolia	4
Magnolia grandiflora	1375
Magnolia soulangiana	18
Magnolia sp	8
Malus floribunda	76
Malus sp	179
Maytenus boaria	184
Melaleuca linarifolia	100
Melaleuca sp	154
Melaleuca stypheloides	10
Melia azederach umbraculiformis	5
Metrosideros excelsus	122
Michelia doltsopa	2
Morus alba	77
Myoporum laetum	56
Myrtus sp	2
Nerium oleander	96
Nyssa sylvatica	75
Olea europaea	102
Other	763
Oxydendron arboreum	2
Palm sp	30
Persea sp / avocado	21

Phoenix canariensis	188
Photinia fraserii	13
Photinia serrulata	3
Photinia sp	25
Pinus canariensis	6
Pinus pinea	20
Pinus radiata	17
Pinus sp	69
Pinus thunbergiana	4
Pistacia chinensis	1150
Pittosporum sp	39
Pittosporum tennuifolium	4
Pittosporum undulatum	156
Platanus acerifolia	3788
Platanus racemosa	48
Podocarpus gracilior	425
Populus fremonti	17
Populus nigra Italica	53
Populus sp	12
Prunus caroliniana	4
Prunus cerasifera	12
Prunus cerasifera/blireiana	2048
Prunus laurocerasus	4
Prunus serrulata	262
Prunus sp	882
Punicia granatum	5
Pyracantha sp	12
Pyrus calleryana cvs	2683
Pyrus kawakami	1427
Queen palm	7
Quercus agrifolia	141
Quercus ilex	58
Quercus palustris	5
Quercus sp	479
Quercus suber	32
Querus lobata	4
Querus rubra	2
Raphiolepsis	11
Rhus lancea	29
Robinia hybrid	178
Robinia pseudoacacia	52
Robinia sp	56

Salix babylonica	32
Salix sp	7
Salix torulosa	4
Sapium sebiferum	201
Schinus molle	110
Schinus terebinthefolia	370
Sequoia sempervirens	48
Shrub	565
Solanum rantonnetiii	3
Solanum sp	8
Sophora japonica	55
Sorbus aucuparia	2
Stump	90
Syagrus romanzoffianum	16
Syringa vulgaris	2
Syzygium paniculatum	79
TBD	2
Taxas sp	3
Tibuchnia	14
Tilia sp	40
Trachycarpus fortunei	31
Tree well only	4053
Tristaniopsis I. `Elegant	38
Tristaniopsis laurina	313
Ulmus americana	97
Ulmus parvifolia	345
Ulmus sp	5
Umbellularia californica	3
Unknown	1123
Walnut tree	2
Washingtonia filifera	31
Washingtonia robusta	274
Yucca gloriosa	31
Zelkova serrata	29

Citywide QA/QC Confidence Statistics Summary

	ADA			Bus Stops			Curb Gutter Damage			Parking Restrictions			Sidewalk Damage			Signs			Trees			Overall Percentage of Features that were Over or Under Collected (Completeness)	Overall Percentage of Features that were MisReported (Accuracy)
	Under Collected	Over Collected	MisReported	Under Collected	Over Collected	MisReported	Under Collected	Over Collected	MisReported	Under Collected	Over Collected	MisReported	Under Collected	Over Collected	MisReported	Under Collected	Over Collected	MisReported	Under Collected	Over Collected	MisReported		
Total Number of Occurrences Found	52	24	96	0	0	1	90	4	21	8	2	8	112	5	206	15	6	36	31	25	33	374	401
Total Number of Features Checked	1575			32			1115			682			2571			975			913			7863	7863
Confidence Statistics Percentages	Percent of Features that were Over or Under Collected (Completeness)		Percent of Features that were MisReported (Accuracy)	Percent of Features that were Over or Under Collected (Completeness)		Percent of Features that were MisReported (Accuracy)	Percent of Features that were Over or Under Collected (Completeness)		Percent of Features that were MisReported (Accuracy)	Percent of Features that were Over or Under Collected (Completeness)		Percent of Features that were MisReported (Accuracy)	Percent of Features that were Over or Under Collected (Completeness)		Percent of Features that were MisReported (Accuracy)	Percent of Features that were Over or Under Collected (Completeness)		Percent of Features that were MisReported (Accuracy)	Percent of Features that were Over or Under Collected (Completeness)		Percent of Features that were MisReported (Accuracy)	4.8%	5.1%
	4.8%		6.1%	0.0%		3.1%	8.1%		1.9%	1.5%		1.2%	4.6%		8.0%	2.2%		3.7%	6.1%		3.6%		

Total Miles Checked	23.8
Average Number of Features that were Over or Under Collected Per Block (Based on Average 450ft. Block)	1.3
Average Number of Features that were MisReported Per Block (Based on Average 450ft. Block)	1.4

Notes:

We have divided the 7 features into distinct categories in the table. The Final Review is for a radom sample consisting of 23 miles of sidewalk and follows a previously completed QA/QC review of 110 miles.

We selected three primary collection criteria and two basic categories:
• Under Collected: Not collected (yellow column)
• Over Collected: Collected, but not found (yellow column)
• MisReported: Collected & found, needing some adjustment (green column)

Due to the robust, comprehensive dataset and possibly competing or overlapping factors, we felt it was a prudent to make a distinction between the two reporting categories.

1. Inventory Completeness: The yellow columns represent features that were over or under collected thus **completeness** of survey.

2. Inventory Accuracy: The green column or "MisReported" features speak to **accuracy** of data.

We document records, and percent findings for Over/Under collection, and MisReported for each of the seven feature layers. We totaled, and averaged out the percentages.

The project goal was 5% confidence statistic. The QA/QC review shows that we met that goal.

Completeness 4.8 %
Accuracy 5.1 %

Additionally a per segment average reveals 1.3 features were over / under collected and 1.4 features were MisReported per 450 ft average segment.

TABLES

COUNCIL DISTRICT BREAKDOWN

*<u>*Disclaimer:</u> You will note that in some cases the values shown in the "Summary of Findings" section of this document do not match the values of tables and charts in the appendix. This is due to the rounding of multiple values calculated in Microsoft Excel and in some cases, specific data has been removed from the calculations.*

Sidewalk Damage by Council District / City Total												
District / Total SW Area / SW Miles	Damage Degree	Damage Type (Sq.Ft)				Totals		Cause of Damage (Sq.Ft)				%Tree Damage
		Cracks	Depress	Faulting	Uplift	Degree	% of Total Damage	Tree	Utility	Sewer	Old Age	
1	Low	98,717	37,753	27,850	6,418	170,738	13%	8,944	6,778	368	154,648	5%
7,299,743	Moderate	214,102	163,200	101,941	59,611	538,854	42%	76,183	27,589	883	434,303	14%
183	High	126,204	132,137	57,133	121,234	436,708	34%	144,298	24,960	1,147	266,328	33%
	V High	12,954	25,794	11,883	88,784	139,415	11%	91,851	3,296	115	44,153	66%
16%	Totals	451,977	358,884	198,807	276,047	1,285,715	18%	321,275	62,623	2,513	899,432	25%
2	Low	91,970	87,432	71,541	10,814	261,757	27%	13,944	8,528	531	238,755	5%
6,082,003	Mod	128,479	131,466	125,563	38,921	424,429	44%	59,910	25,387	1,346	337,788	14%
144	High	72,870	63,593	41,984	45,474	223,921	23%	56,928	10,163	1,048	155,783	25%
	V High	12,405	10,269	6,903	23,968	53,545	6%	24,354	3,047	307	25,837	45%
13%	Totals	305,724	292,760	245,990	119,177	963,653	13%	155,136	47,124	3,232	758,162	16%
3	Low	203,964	65,736	37,650	13,066	320,416	33%	12,528	13,634	1,038	293,218	4%
8,008,734	Mod	138,445	125,254	49,013	39,199	351,911	36%	38,423	30,054	2,841	280,594	11%
182	High	44,089	122,350	16,620	55,523	238,582	24%	53,982	18,650	1,224	164,726	23%
	V High	10,686	32,495	4,401	24,398	71,980	7%	23,126	3,575	699	44,581	32%
16%	Totals	397,184	345,835	107,683	132,186	984,991	14%	128,058	65,913	5,802	783,118	13%
4	Low	57,850	23,594	58,382	6,741	146,567	17%	6,778	8,944	368	154,649	5%
5,064,695	Mod	128,652	59,333	180,623	28,722	397,330	46%	66,555	21,874	2,798	306,104	17%
138	High	98,135	26,666	71,560	53,309	249,670	29%	73,332	9,917	889	165,643	29%
	V High	17,999	6,133	10,473	26,708	61,313	7%	29,393	2,440	621	28,859	48%
12%	Totals	302,636	115,726	321,038	115,480	854,880	12%	176,058	43,175	4,676	655,255	21%
5	Low	70,496	39,951	48,674	6,326	165,447	20%	6,826	3,871	260	154,491	4%
5,425,851	Mod	135,290	93,156	120,976	26,336	375,758	45%	29,903	20,174	1,003	324,679	8%
132	High	85,051	56,660	37,545	49,761	229,017	28%	50,066	10,791	931	167,230	22%
	V High	15,518	9,488	9,078	27,931	62,015	7%	24,550	2,230	291	34,945	40%
12%	Totals	306,355	199,255	216,273	110,354	832,237	11%	111,345	37,064	2,485	681,345	13%
6	Low	27,704	8,513	72,745	4,350	113,312	11%	6,689	3,962	309	102,353	6%
5,821,839	Mod	165,714	38,716	257,976	28,152	490,558	48%	62,288	28,548	1,283	398,441	13%
161	High	142,729	35,004	114,951	45,915	338,599	33%	68,451	20,359	2,400	247,390	20%
	V High	40,020	9,087	14,987	25,788	89,882	9%	28,569	4,102	659	56,554	32%
14%	Totals	376,167	91,320	460,659	104,205	1,032,351	14%	165,996	56,970	4,651	804,737	16%
7	Low	60,560	6,433	115,563	5,678	188,234	15%	9,857	7,310	1,140	169,928	5%
7,009,756	Mod	223,819	32,481	293,291	29,941	579,532	45%	59,820	37,928	2,573	479,212	10%
186	High	188,218	46,411	106,924	53,772	395,325	31%	76,750	25,596	3,287	289,693	19%
	V High	59,825	21,102	23,618	27,406	131,951	10%	33,154	5,620	920	92,257	25%
17%	Totals	532,422	106,427	539,396	116,797	1,295,042	18%	179,581	76,453	7,920	1,031,090	14%
44712621												
1126												
Totals Citywide		2,672,465	1,510,207	2,089,845	974,245	7,248,869	100%	1,057,868	389,321	31,278	5,613,137	15%

*Damage Types "No Sidewalk and "Under Construction" have not been included in the above calculations.

Sidewalk Tree Inventory by Council District

Council District	Tree Count	Well Only Count	10 Most Prevalent Speices												% Total	Trees/Mile
			1	2	3	4	5	6	7	8	9	10	Total of 10 Most Prevalent	Count of Remaining Species		
1	9618	715	Platanus acerifolia	Liquidamber styraciflua	Pyrus calleryana cvs	Fraxinus sp	Prunus cerasifera/blireiana	Prunus sp	Celtis sp	Acer sp	Fraxinus o. raywood	Langerstroemia indica			25.0%	53
			846	703	674	455	415	390	366	355	335	317	4856	4762		
2	5747	404	Platanus acerifolia	Liquidamber styraciflua	Pyrus calleryana cvs	Lophostemon Confertus	Prunus cerasifera/blireiana	Langerstroemia indica	Quercus sp	Pisttacia chinensis	Magnolia grandiflora	Pyrus kawakami	Total of 10 Most Prevalent	Count of Remaining Species	15.0%	40
			730	546	309	256	251	240	227	191	159	143	3052	2695		
3	6353	898	Platanus acerifolia	Magnolia grandiflora	Pyrus calleryana cvs	Langerstroemia indica	Prunus cerasifera/blireiana	Lophostemon confertus	Liquidamber styraciflua	Ginkgo biloba	Pyrus kawakami	Acer sp	Total of 10 Most Prevalent	Count of Remaining Species	16.5%	35
			1170	418	352	349	320	277	274	266	188	185	3799	2554		
4	5037	572	Pyrus calleryana cvs	Liquidamber styraciflua	Langerstroemia indica	Prunus cerasifera/blireiana	Pyrus kawakami	Fraxinus o, 'Raywood'	Pistacia chinensis	Fraxinus sp	Cercis sp	Magnolia grandiflora	Total of 10 Most Prevalent	Count of Remaining Species	13.1%	37
			554	504	419	379	334	285	178	170	143	130	3096	1941		
5	4197	528	Liquidambar styraciflua	Pyrus calleryana cvs	Lagerstroemia indica	Pistacia chinensis	Platanus acerifolia	Acer sp	Prunus cerasifera/bli reiana	Magnolia grandiflora	Fraxinus o. 'Raywood'	Pyrus kawakami	Total of 10 Most Prevalent	Count of Remaining Species	10.9%	32
			473	383	270	224	204	181	157	142	134	124	2292	1905		
6	3968	458	Liquidambar styraciflua	Prunus cerasifera/blireiana	Platanus acerifolia	Pyrus calleryana cvs	Lagerstroemia indica	Pyrus kawakami	Fraxinus o. 'Raywood'	Magnolia grandiflora	Cinnamom um camphora	Jacaranda acutifolia	Total of 10 Most Prevalent	Count of Remaining Species	10.3%	25
			406	358	283	225	184	168	164	152	120	67	2127	1841		
7	3496	670	Platanus acerifolia	Liquidambar styraciflua	Pyrus calleryana cvs	Fraxinus o. 'Raywood'	Lagerstroemia indica	Prunus cerasifera/blireiana	Pyrus kawakami	Magnolia grandiflora	Celtis sp	Podocarpus gracilior	Total of 10 Most Prevalent	Count of Remaining Species	9.1%	19
			492	406	186	182	174	168	104	85	82	80	1959	1537		
Citywide	38416	4245	Platanus acerifolia	Liquidamber styraciflua	Pyrus calleryana cvs	Prunus cerasifera/blireiana	Lagerstroemia indica	Pyrus kawakami	Magnolia grandiflora	Fraxinus o. 'Raywood'	Pistacia chinensis	Acer sp	Total of 10 Most Prevalent	Count of Remaining Species	100%	34
			3788	3312	2683	2048	1953	1427	1375	1327	1150	1123	20186	18230		

ADA Travelway Obstructions

District ID	Trip Fall Hazards						Obstructions						Trees			
SW Miles	Sidewalk Damge (records in travleway)	Records Per Mile	Cross Slope >5%	Records Per Mile	Travel Direction >8%	Records Per Mile	Transportation Barriers	Records Per Mile	Commercial Barriers	Records Per Mile	Other Barriers	Records Per Mile	Low Limbs	Records Per Mile	Trunk Lean	Records Per Mile
1	5737	**31.35**	650	**3.55**	56	**0.31**	10	**0.05**	3	**0.02**	750	**4.10**	1,353	**7.39**	61	**0.33**
183																
Percent Total	**14%**		**21%**		**8%**		**5%**		**27%**		**19%**		**33%**		**24%**	
2	5863	**40.72**	222	**1.54**	147	**1.02**	8	**0.06**	2	**0.01**	428	**2.97**	564	**3.92**	53	**0.37**
144																
Percent Total	**14%**		**7%**		**20%**		**4%**		**18%**		**11%**		**14%**		**21%**	
3	3842	**21.11**	888	**4.88**	115	**0.63**	17	**0.09**	2	**0.01**	357	**1.96**	300	**1.65**	27	**0.15**
182																
Percent Total	**9%**		**28%**		**16%**		**9%**		**18%**		**9%**		**7%**		**11%**	
4	6081	**44.07**	352	**2.55**	178	**1.29**	23	**0.17**	1	**0.01**	736	**5.33**	509	**3.69**	12	**0.09**
138																
Percent Total	**15%**		**11%**		**24%**		**13%**		**9%**		**19%**		**12%**		**5%**	
5	3824	**28.97**	322	**2.44**	91	**0.69**	12	**0.09**	1	**0.01**	355	**2.69**	169	**1.28**	20	**0.15**
132																
Percent Total	**9%**		**10%**		**12%**		**7%**		**9%**		**9%**		**4%**		**8%**	
6	8241	**51.19**	304	**1.89**	79	**0.49**	70	**0.43**	1	**0.01**	682	**4.24**	680	**4.22**	44	**0.27**
161																
Percent Total	**20%**		**10%**		**11%**		**38%**		**9%**		**17%**		**17%**		**18%**	
7	8089	**43.49**	412	**2.22**	65	**0.35**	43	**0.23**	1	**0.01**	647	**3.48**	531	**2.85**	34	**0.18**
186																
Percent Total	**19%**		**13%**		**9%**		**23%**		**9%**		**16%**		**13%**		**14%**	

Citywide Totals and Averages	41,677	**37.27**	3,150	**2.73**	731	**0.68**	183	**0.16**	11	**0.01**	3,955	**3.54**	4,106	**3.57**	251	**0.22**

*Low Sidewalk Damage and Cross Slope of 2-5% has not been included in the above calculations.

Parking Restrictions						
District	All values in linear feet					
	Blue - Handicap Park	Green - 10 Min.Park	Red - No Parking	White - Loading Zone	Yellow - 30 Min, Park	Total
1	3,097	1,447	93,996	1,889	3,656	**104,085**
2	3,089	1,328	101,668	3,830	8,915	**118,830**
3	4,146	2,691	148,752	5,899	14,000	**175,488**
4	934	2,597	53,144	756	1,144	**58,575**
5	2,441	1,014	68,839	1,981	3,565	**77,840**
6	2,408	463	55,602	478	853	**59,804**
7	2,577	214	69,610	1,345	1,113	**74,859**
Totals	**18,692**	**9,754**	**591,611**	**16,178**	**33,246**	**669,481**

*Parking Restriction color “Other” has not been included in the above calculations.

SIGN INVENTORY									
District	Total Number of Signs	Condition			Pole Type				
		Good	Fair	Poor	Metal	Wood	Other	St. Light	Taffic Sig.
1	7855	5539	965	1351	6981	282	10	482	100
2	5756	3950	1099	707	4440	205	11	949	151
3	8480	6624	843	1013	6010	365	58	1739	308
4	4956	4192	319	445	4541	210	3	154	48
5	5705	4153	541	1011	5080	211	14	312	88
6	5983	4193	869	921	5431	145	3	339	65
7	6740	4770	736	1234	6071	168	2	415	84
Totals	**45475**	**33421**	**5372**	**6682**	**38554**	**1586**	**101**	**4390**	**844**

Bus Stops						
Council District	Number of Bus Stop Locations	Number of Bus Stops with Bench	Number of Bus Stops with Shelter	Poletype		
				Metal	Wood	Other
1	270	116	15	265	4	1
2	264	94	34	262	0	2
3	337	153	46	332	1	4
4	193	41	7	191	1	1
5	179	43	9	179	0	0
6	181	20	9	180	1	0
7	241	31	6	240	1	0
Totals	**1,665**	**498**	**126**	**1,649**	**8**	**8**

Curb & Gutter Damage							
District	Damage Degree	Statistics					
SW Miles		Curb Damage / Lin. Ft.	Gutter Damage Area (SqFt)	% Curb Damage	% Gutter Damage	Lin. Ft/Mi	SqFt/Mi
1	Moderate	21,356	21,873	52%	58%	117	120
	High	11,927	13,878	29%	37%	66	76
182	V High	7,454	1,786	18%	5%	41	10
Totals		**40,737**	**37,537**	**15%**	**20%**	**224**	**206**
2	Mod	19,815	15,157	53%	75%	138	105
	High	10,829	4,349	29%	21%	75	30
144	V High	6,420	735	17%	4%	45	5
Totals		**37,064**	**20,241**	**13%**	**11%**	**257**	**141**
3	Mod	27,446	28,519	52%	68%	152	158
	High	12,160	11,061	23%	26%	67	61
181	V High	13,436	2,551	25%	6%	74	14
Totals		**53,042**	**42,131**	**19%**	**23%**	**293**	**233**
4	Mod	15,650	13,054	54%	64%	114	95
	High	8,940	6,117	31%	30%	65	45
137	V High	4,356	1,106	15%	5%	32	8
Totals		**28,946**	**20,277**	**10%**	**11%**	**211**	**148**
5	Mod	18,973	13,923	52%	85%	144	105
	High	8,402	2,083	23%	13%	64	16
132	V High	9,427	346	26%	2%	71	3
Totals		**36,802**	**16,352**	**13%**	**9%**	**279**	**124**
6	Mod	9,660	6,315	38%	45%	60	39
	High	7,000	6,740	27%	48%	43	42
161	V High	8,821	963	35%	7%	55	6
Totals		**25,481**	**14,018**	**9%**	**7%**	**158**	**87**
7	Mod	18,754	17,840	34%	49%	101	96
	High	11,358	13,333	21%	37%	61	72
186	V High	24,541	5,343	45%	15%	132	29
Totals		**54,653**	**36,516**	**20%**	**20%**	**294**	**196**

Totals Citywide	**276,725**	**187,072**	**100%**	**100%**	**246**	**167**

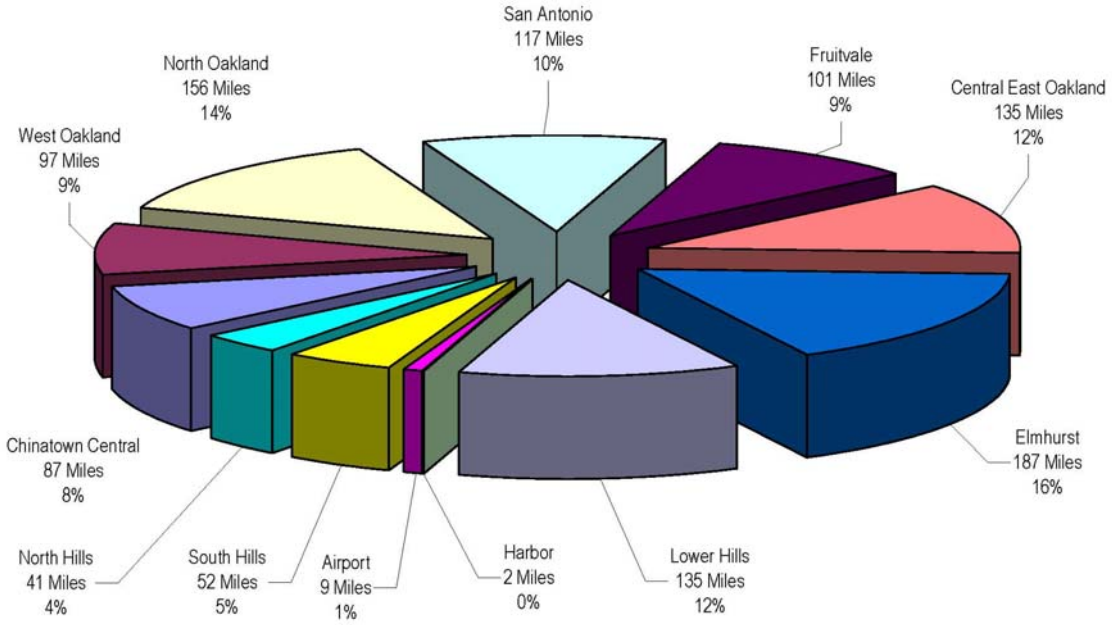
*Damage Type "Low" for Curb and for Gutter has not been included in the above calculations.

CHARTS

COUNCIL DISTRICT BREAKDOWN

*<u>*Disclaimer:</u> You will note that in some cases the values shown in the "Summary of Findings" section of this document do not match the values of tables and charts in the appendix. This is due to the rounding of multiple values calculated in Microsoft Excel and in some cases, specific data has been removed from the calculations.*

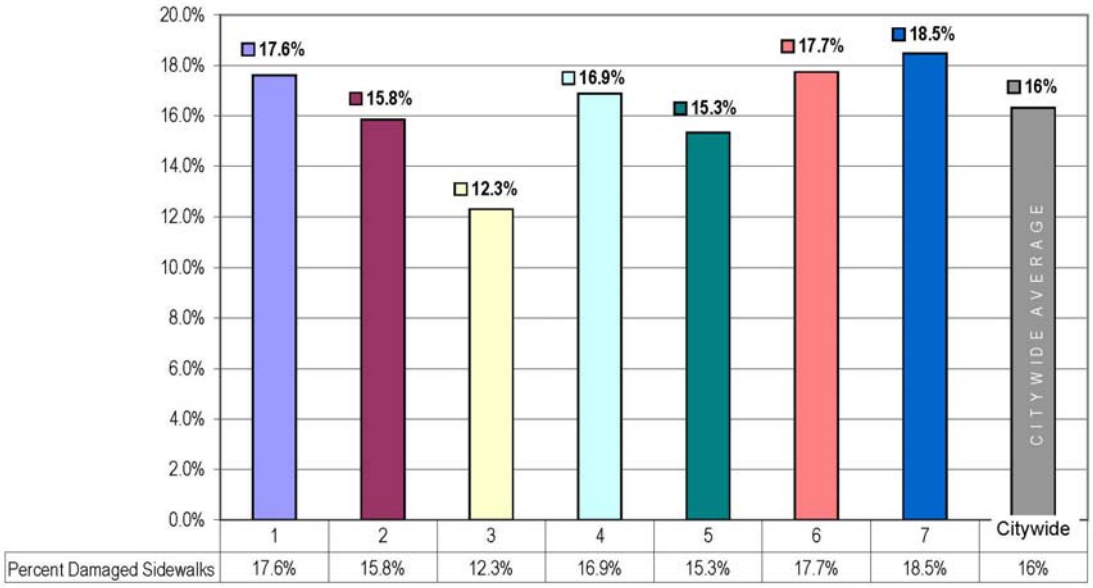
Sidewalk Miles by Plan Area



Oakland Sidewalk / ADA Inventory

Percent of Damaged Sidewalks by Council District

(Based on a total 7,248,747 square feet of Sidewalk Damage)



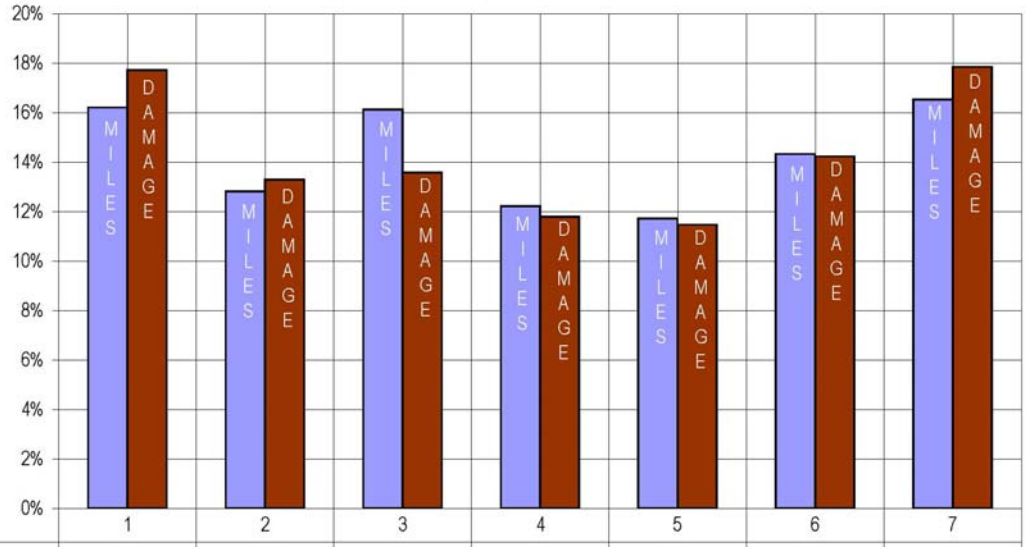
	1	2	3	4	5	6	7	Citywide
Percent Damaged Sidewalks	17.6%	15.8%	12.3%	16.9%	15.3%	17.7%	18.5%	16%

*Damage Types "No Sidewalk" and "Under Construction" have not been included in the above calculations.

City of Oakland

Relationship Between Percent of Sidewalk Miles and Percent of Sidewalk Damage

(Based on 1126 Miles of Sidewalk and 7,248,869 square feet of Sidewalk Damage)



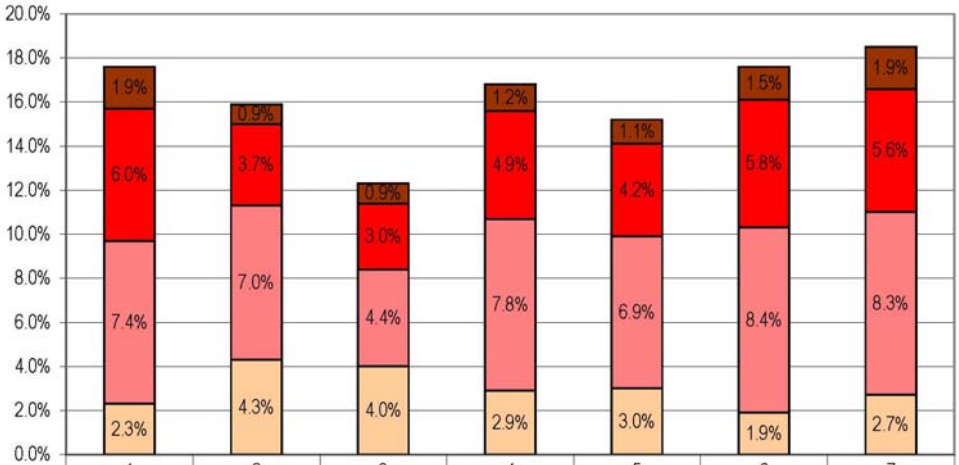
	1	2	3	4	5	6	7
Miles	16%	13%	16%	12%	12%	14%	17%
Damage	18%	13%	14%	12%	11%	14%	18%

*Damage Types "No Sidewalk" and "Under Construction" have not been included in the above calculations.

City of Oakland

Sidewalk Damage Severity Breakdown by Council District

(Based on a total 7,248,747 square feet of Sidewalk Damage)



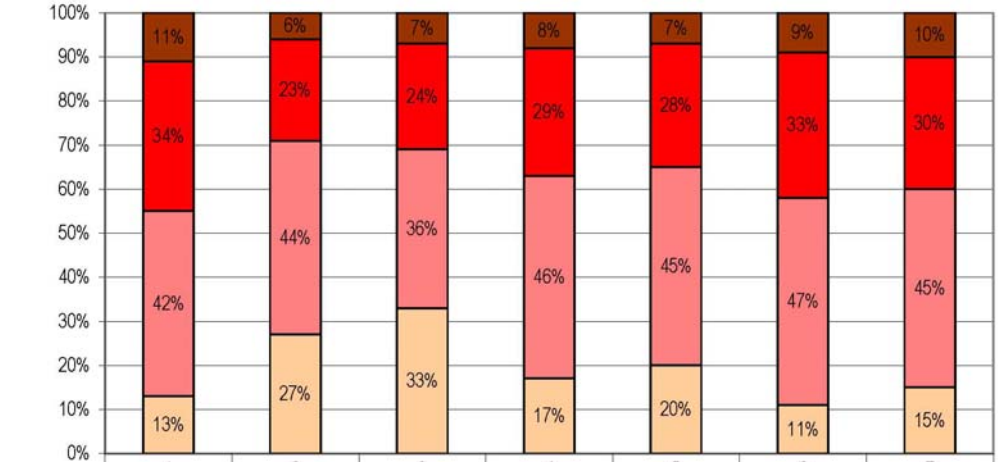
	1	2	3	4	5	6	7
Very High	1.9%	0.9%	0.9%	1.2%	1.1%	1.5%	1.9%
High	6.0%	3.7%	3.0%	4.9%	4.2%	5.8%	5.6%
Moderate	7.4%	7.0%	4.4%	7.8%	6.9%	8.4%	8.3%
Low	2.3%	4.3%	4.0%	2.9%	3.0%	1.9%	2.7%

*Damage Types "No Sidewalk" and "Under Construction" have not been included in the above calculations.

City of Oakland

Sidewalk Damage Severity Breakdown by Council District

(Based on a total 7,248,869 square feet of Sidewalk Damage)



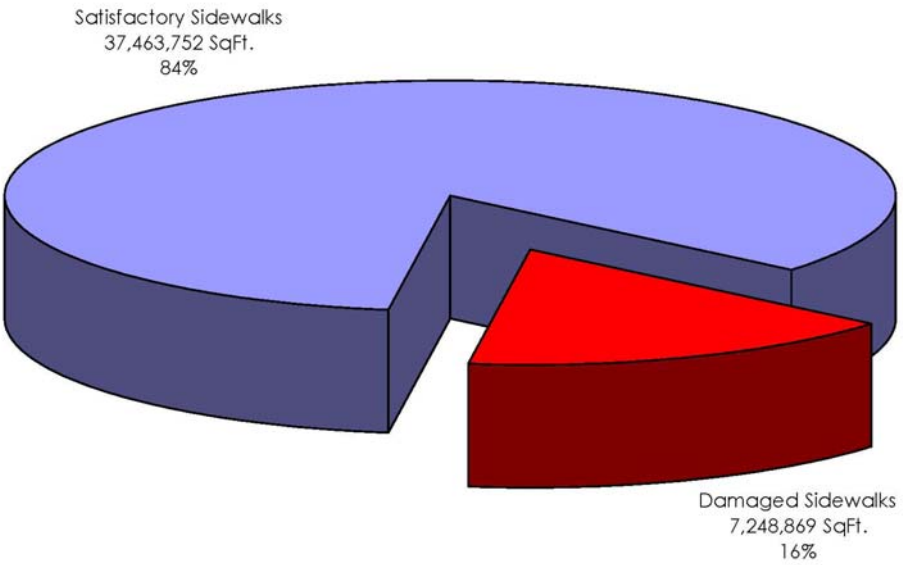
	1	2	3	4	5	6	7
Very High	11%	6%	7%	8%	7%	9%	10%
High	34%	23%	24%	29%	28%	33%	30%
Moderate	42%	44%	36%	46%	45%	47%	45%
Low	13%	27%	33%	17%	20%	11%	15%

*Damage Types “No Sidewalk” and “Under Construction” have not been included in the above calculations.

City of Oakland

Average Percent of Damaged Sidewalks Citywide

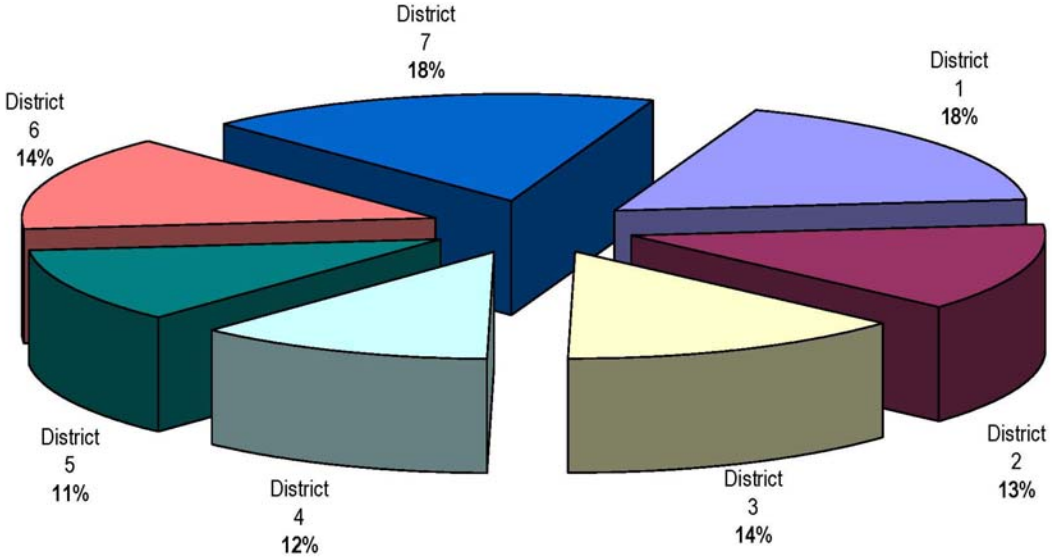
(Based on a total 7,248,869 sqft of Sidewalk Damage out of 44,712,621 sqft of sidewalk surface)



City of Oakland

Percent of Overall Sidewalk Damage by Council District

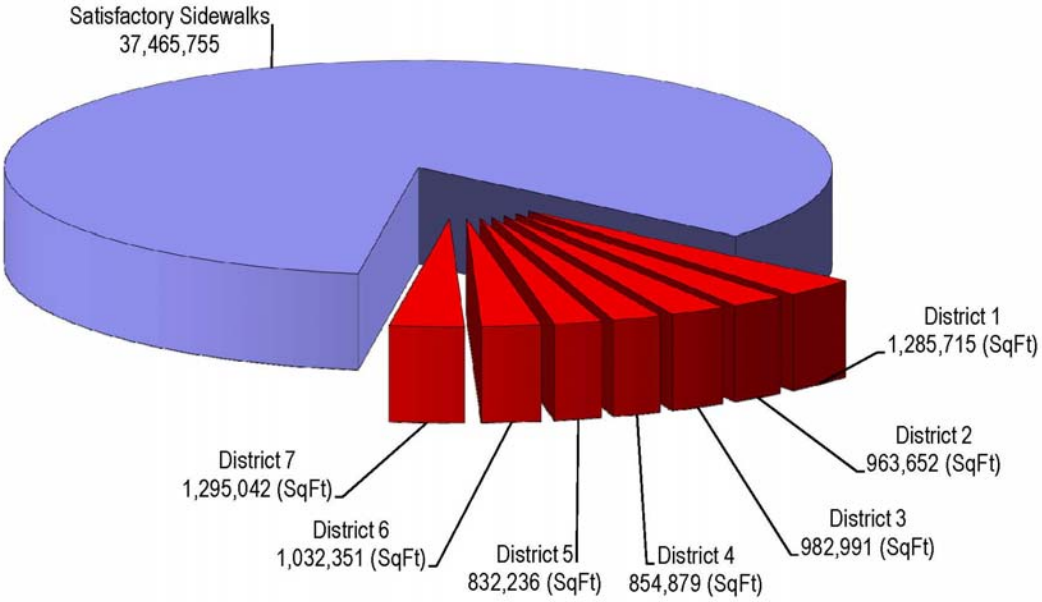
(Based on a total 7,248,869 square feet of Sidewalk Damage)



City of Oakland

Sidewalk Damage Square Footage by Council District

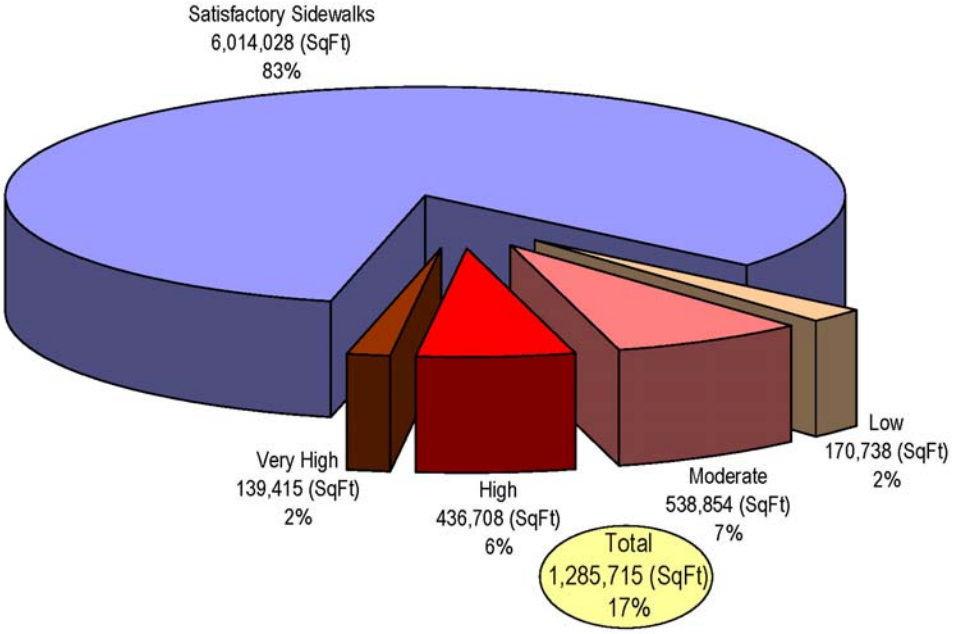
(Based on a total 7,246,866 square feet of Sidewalk Damage out of 44,712,621 sqft of sidewalk surface)



City of Oakland

Percent of Damaged Sidewalks - Council District 1

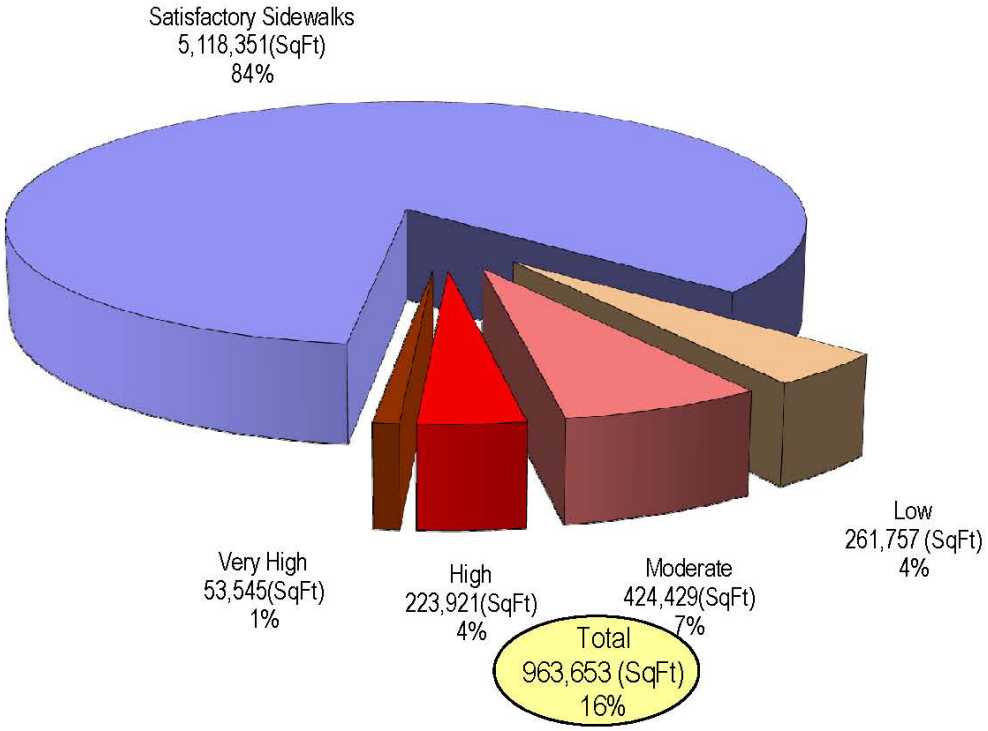
(Based on a total sidewalk area of 7,299,743 square feet in Council District 1)



City of Oakland

Percent of Damaged Sidewalks - Council District 2

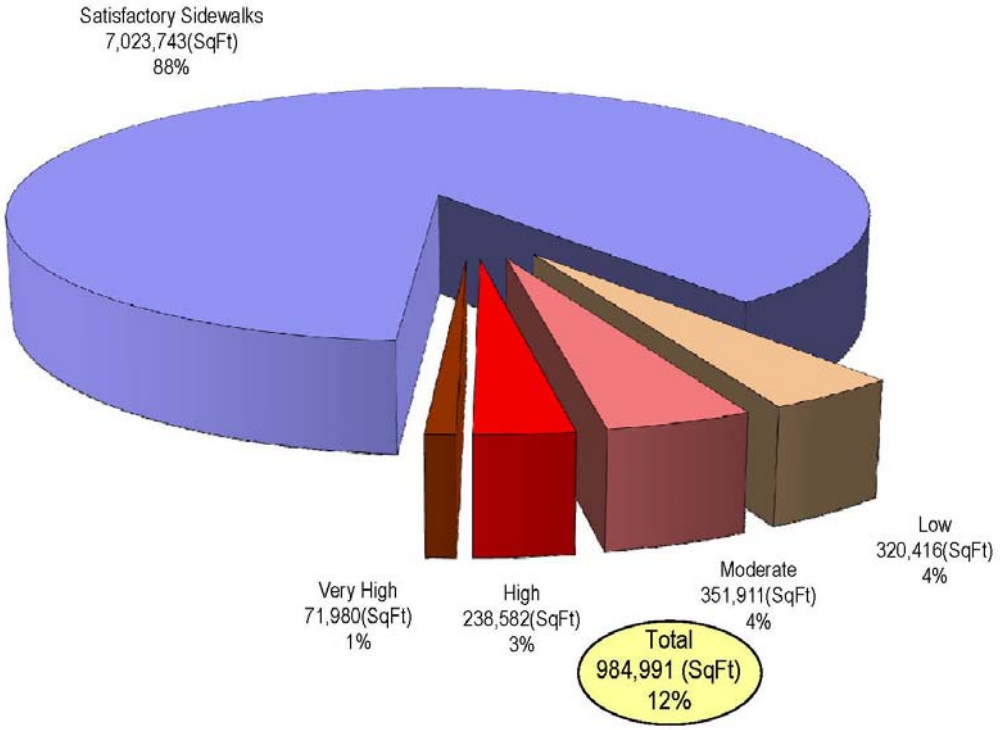
(Based on a total sidewalk area of 6,082,003 square feet in Council District 2)



City of Oakland

Percent of Damaged Sidewalks - Council District 3

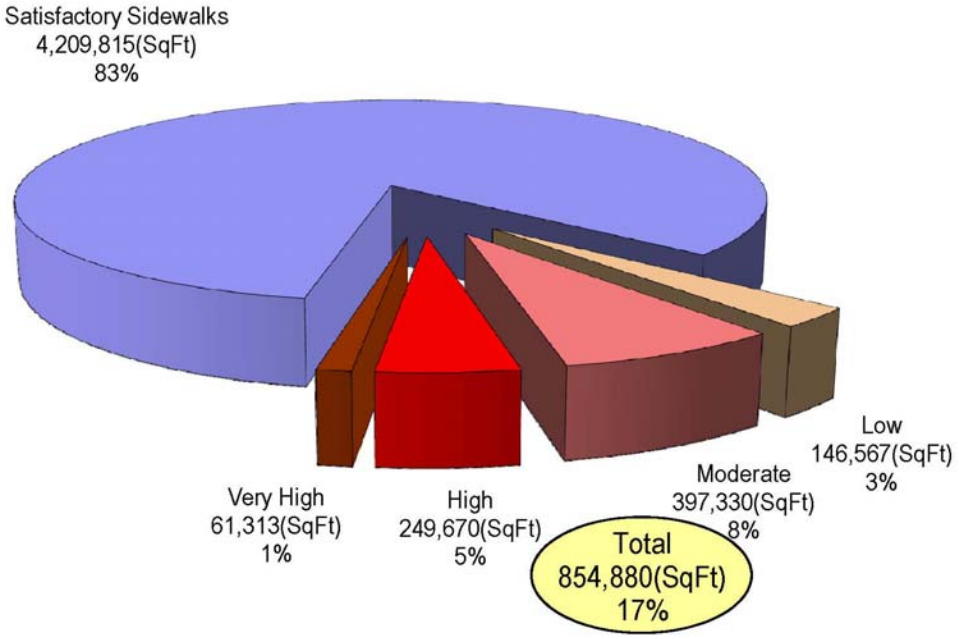
(Based on a total sidewalk area of 8,008,734 square feet in Council District 3)



City of Oakland

Percent of Damaged Sidewalks - Council District 4

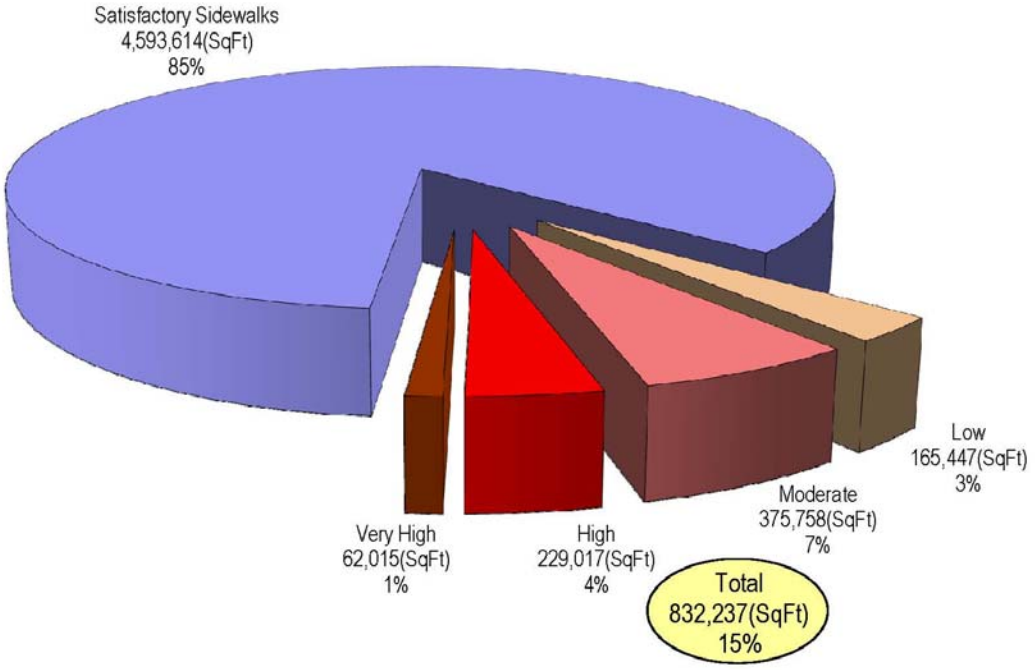
(Based on a total sidewalk area of 5,064,695 square feet in Council District 4)



City Of Oakland

Percent of Damaged Sidewalk - Council District 5

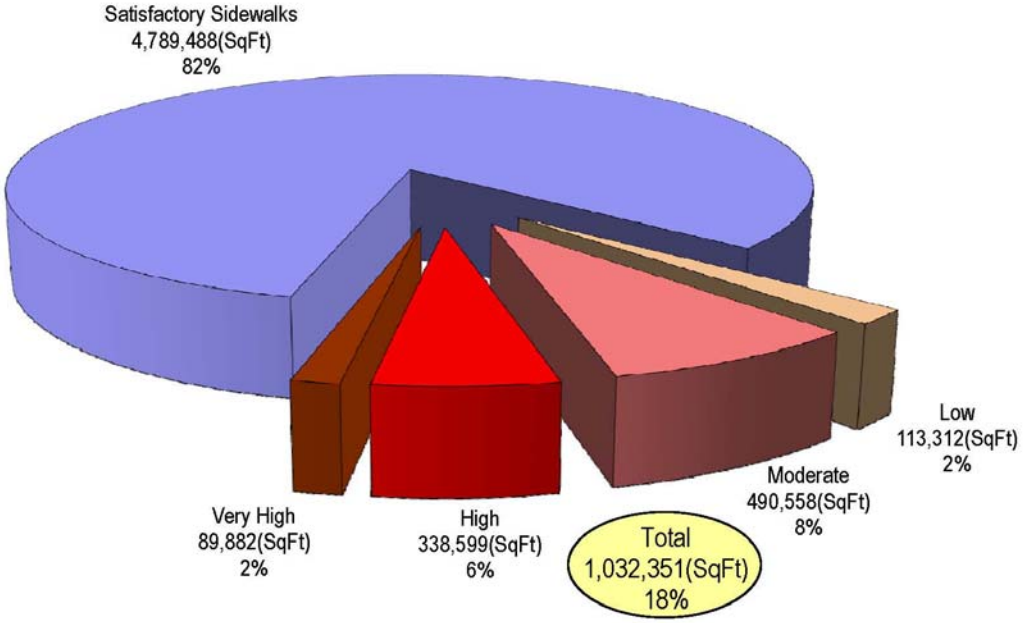
(Based on total sidewalk area of 5,425,851 square feet in Council District 5)



City of Oakland

Percent of Damaged Sidewalks - Council District 6

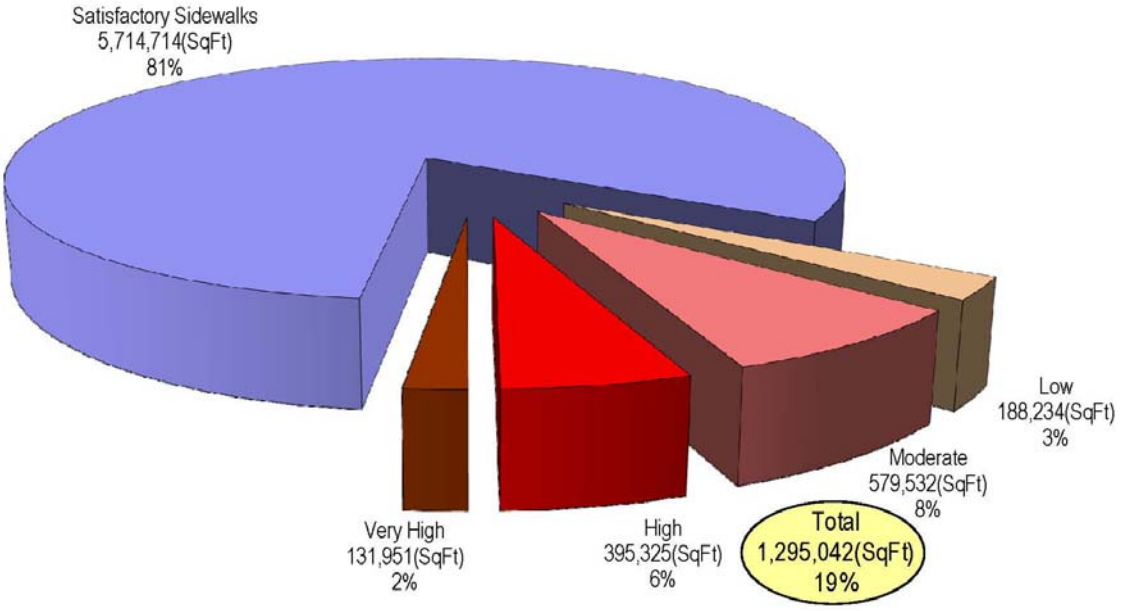
(Based on total sidewalk area of 5,821,839 square feet in Council District 6)



City of Oakland

Percent of Damaged Sidewalks - Council District 7

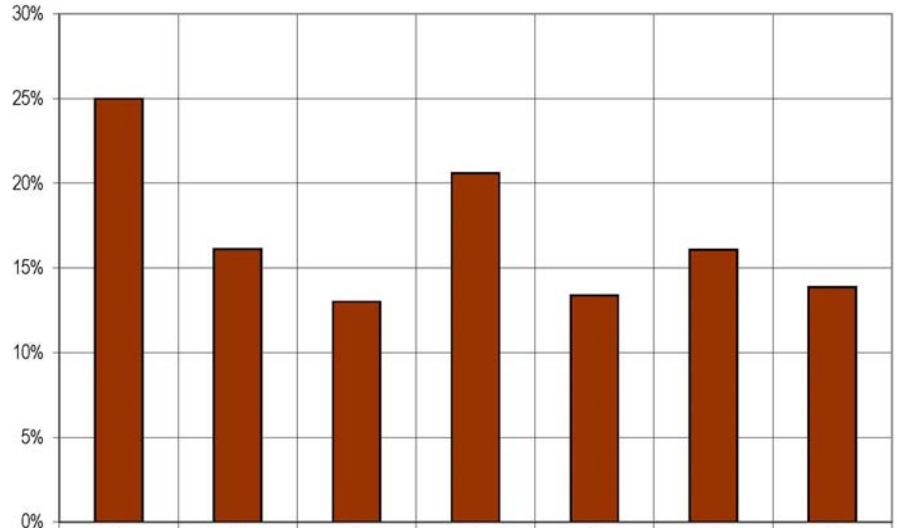
(Based on a total sidewalk area of 7,009,756 square feet in Council District 7)



City of Oakland

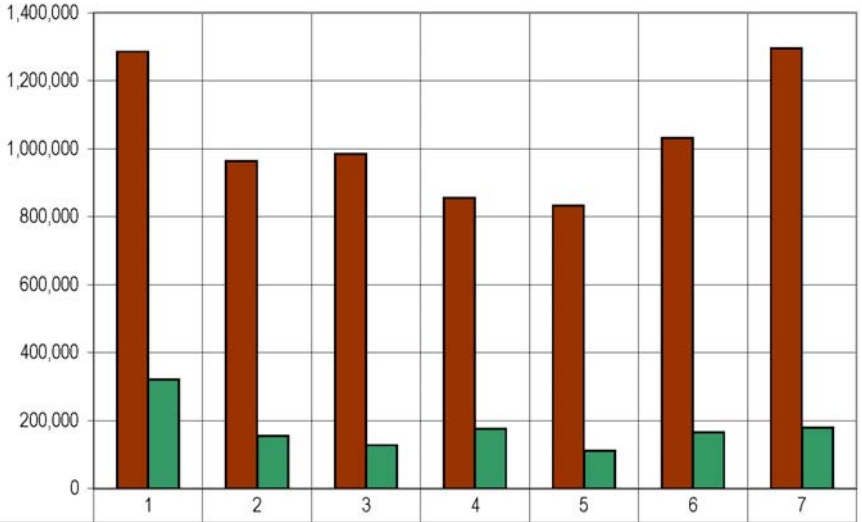
Percent of Sidewalk Damage Caused by Trees

(Based on 1,057,868 square feet of Sidewalk Damage caused by Trees)



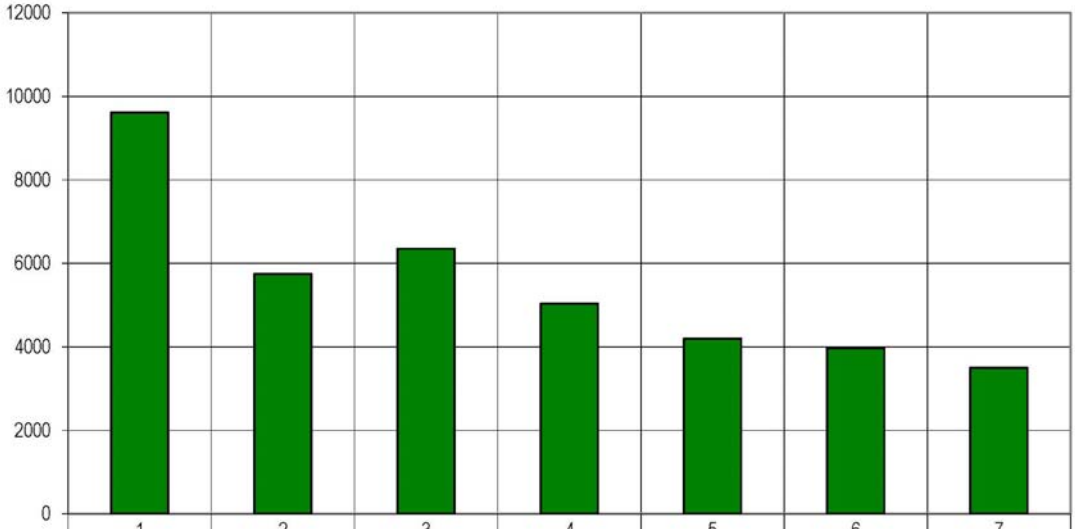
	1	2	3	4	5	6	7
Percent Damage Caused by Trees	25%	16%	13%	21%	13%	16%	14%

City of Oakland
Overall Sidewalk Damage vs. Damage Caused by Tree
(Based on 1,057,868 square feet of Sidewalk Damage caused by Trees)



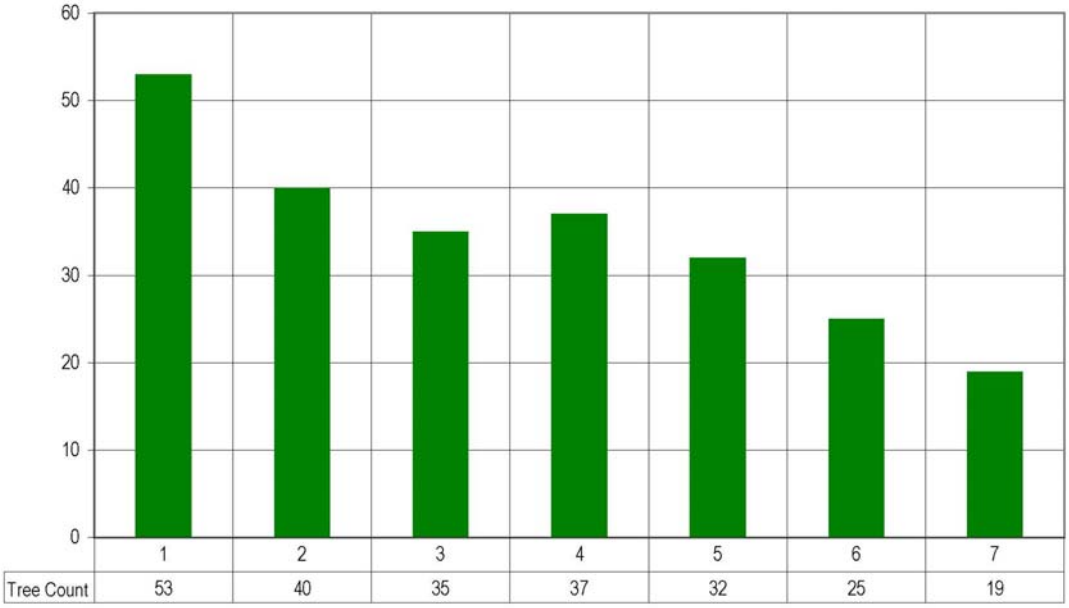
	1	2	3	4	5	6	7
Overall Damage (SqFt)	1,285,715	963,653	984,991	854,880	832,237	1,032,351	1,295,042
Damage Caused by Tree (SqFt)	321,275	155,136	128,058	176,058	111,345	165,996	179,581

City of Oakland
Tree Count Totals by Council District
(Total Locations 38,416)



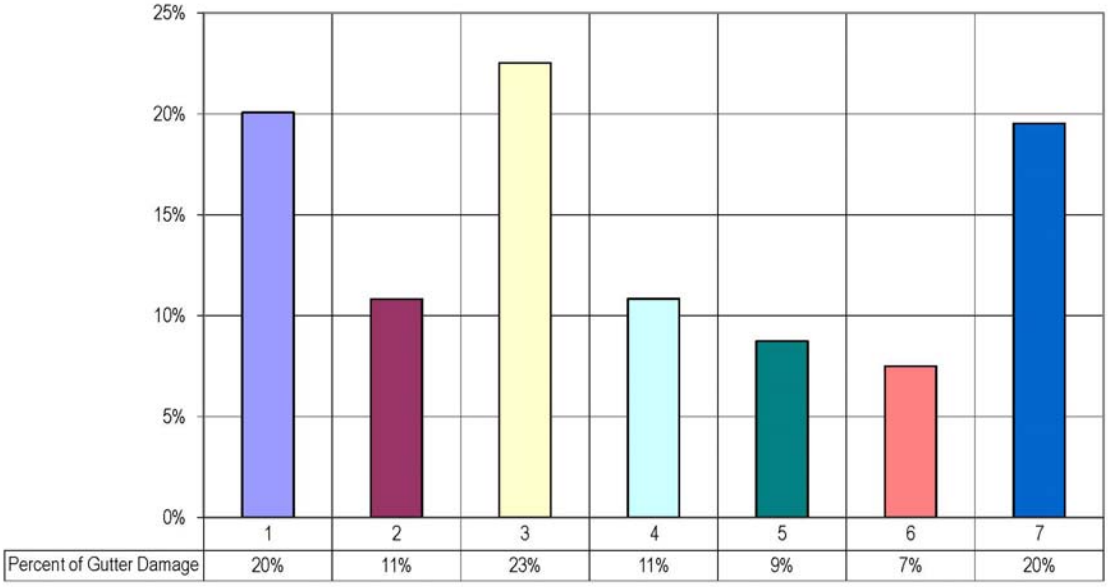
	1	2	3	4	5	6	7
Tree Totals	9618	5747	6353	5037	4197	3968	3496

City of Oakland
Number of Street Trees per Mile
(Total Locations 38,416)



	1	2	3	4	5	6	7
Tree Count	53	40	35	37	32	25	19

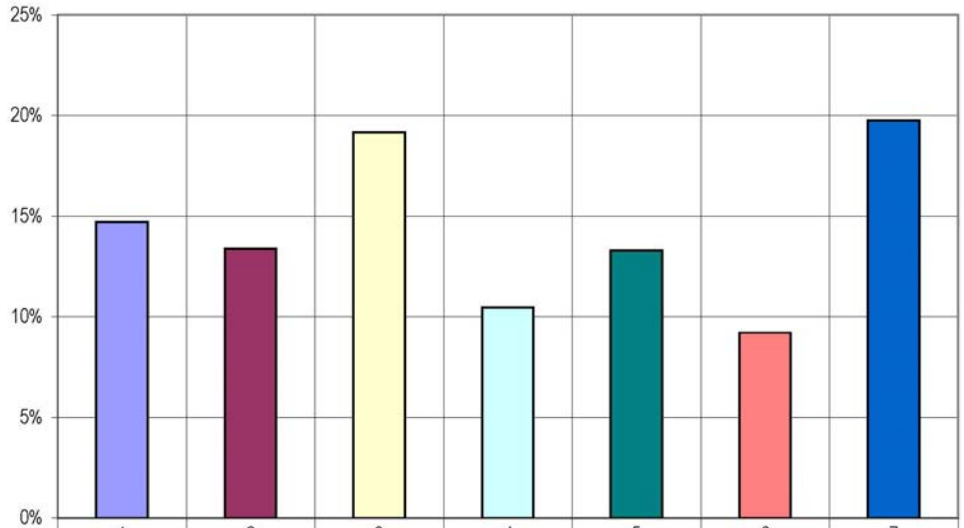
City of Oakland
Percent of Overall Gutter Damage by Council District
(Based on a total of 187,072 Square Feet of Gutter Damage)



	1	2	3	4	5	6	7
Percent of Gutter Damage	20%	11%	23%	11%	9%	7%	20%

*Damage Type "Low Gutter" has not been included in the above calculations.

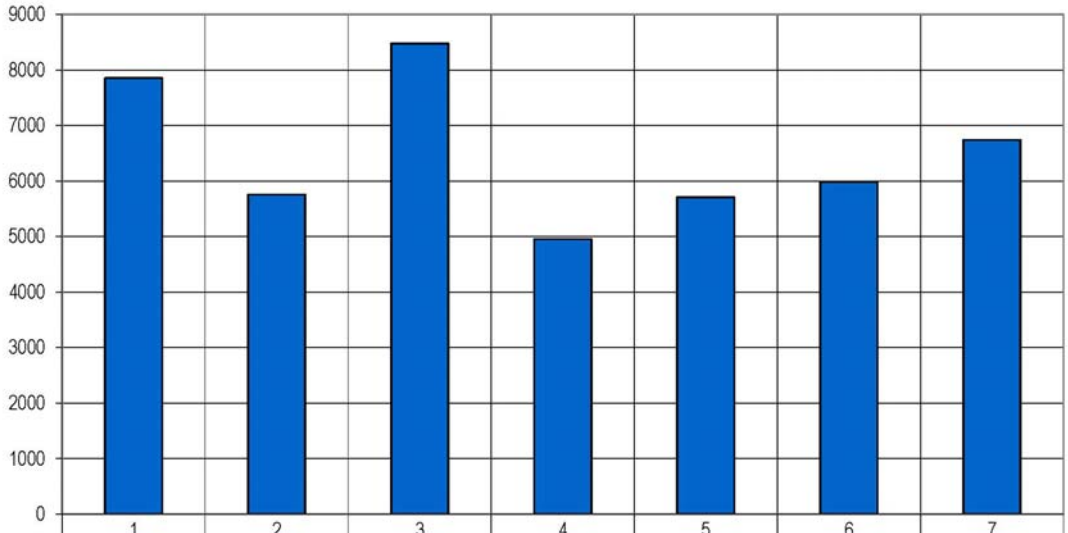
City of Oakland
Percent of Overall Curb Damage by Council District
(Based on a total of 276,725 Linear Feet of Curb Damage)



	1	2	3	4	5	6	7
Percent of Curb Damage	15%	13%	19%	10%	13%	9%	20%

* Damage Type "Low Curb" has not been included in the above calculations.

City of Oakland
Sign Count Totals by Council District
(Total Locations = 45,475)

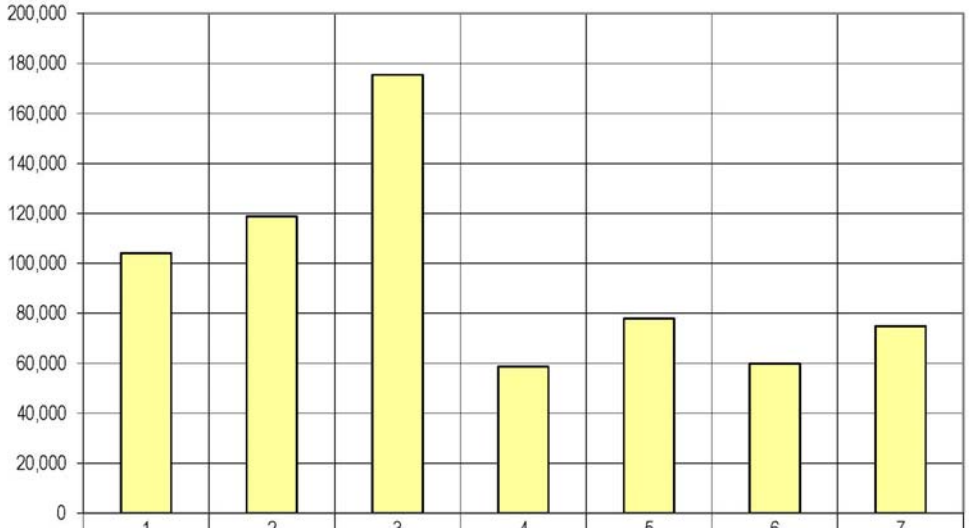


	1	2	3	4	5	6	7
Sign Count	7855	5756	8480	4956	5705	5983	6740

City of Oakland

Linear Feet of Parking Restriction by Council District

(Based on citywide total of 669,481 liner feet of Painted Curb)



	1	2	3	4	5	6	7
Linear Feet of Painted Curb	104,085	118,830	175,448	58,575	77,840	59,804	74,859

*Parking Restriction color "Other" has not been included in the above calculations.