HAND DELIVERED
MPinto

City of Los Angeles

Trash Monitoring & Reporting Plan:

Santa Monica Bay Nearshore and Offshore Debris TMDL

Submitted by:

CITY OF LOS ANGELES
SANITATION
DEPARTMENT OF
PUBLIC WORKS

City of Los Angeles
Department of Public Works
Bureau of Sanitation, Watershed Protection Division
1149 S Broadway, 10th Floor
Los Angeles, CA 90015-2213

September 19, 2012

Contents

Figures

Tables

Appendices

1. Introduction

This report outlines the Santa Monica Bay Nearshore and Offshore Debris Total Maximum Daily Load (Debris TMDL) Trash Monitoring and Reporting Plan (TMRP) as required by Resolution No. R10-010 of the California Regional Water Quality Control Board - Los Angeles Region (Regional Board). It should be noted that though entitled "Trash Monitoring and Reporting Plan" this document has focused on the implementation measures, institutional and structural, that the City of Los Angeles (City) will employ to satisfy the progressive TMDL requirements. The City's basis for this plan development is similar to that employed in the Machado Lake Trash TMDL TMRP that was established on the advisement of Regional Board staff and subsequently approved.

This TMRP is to solely address the portion of the City that lies within the Santa Monica Bay watershed to meet the TMDL compliance milestones. This TMRP is broken down into two categories, for point sources and for non-point sources, as the Debris TMDL identifies the City as one of the jurisdictions that is responsible for both sources. The City will present its proposed actions in this TMRP in how it will achieve compliance. The City intends to meet compliance with its Point Sources by having already installed or installing Full Capture Trash devices within all catch basins within the City portion of the watershed and augmenting these efforts with partial capture devices or enhanced institutional measures. Chapter 3 describes existing Trash Collection Rate studies that will be used to establish Waste Load Allocations and that have been acknowledged by the Regional Board as suffice in meeting TMDL requirements. Chapter 4 describes theTrash Monitoring and Reporting Plan for non-point sources from the Venice Boardwalk area that is under the City's jurisdiction.

This TMRP does not include a Plastic Pellet Monitoring and Reporting Plan (PMRP) for plastic pellet discharges from the MS4. The City will develop the PMRP as a separate document and submit the plan to Regional Board within 18 months of effective date of the Debris TMDL.

2. Background

2.1. Watershed Description

The Santa Monica Bay is an integral part of the larger geographic region commonly known as the Southern California Bight. It is bordered offshore by the Santa Monica Basin, to the north by the rocky headlands of Point Dume and to the south by the Palos Verdes Peninsula, and onshore by the Los Angeles Coastal Plain and the Santa Monica Mountains. The 414 square mile area of land that drains naturally to the Bay, known as the Santa Monica Bay watershed, is bordered on the north by the Santa Monica Mountains from the Ventura-Los Angeles County line to Griffith Park, extending south and west across the Los Angeles coastal plain to include the area east of Ballona Creek and north of Baldwin Hills. South of Ballona Creek, a narrow coastal strip between Playa del Rey and the Palos Verdes Peninsula forms the southern boundary of the watershed. Figure 1 illustrates the county lines and the boundaries of the Santa Monica Bay Watershed.

The Santa Monica Bay itself is the submerged portion of the Los Angeles Coastal Plain. The continental shelf extends seaward to the shelf break about 265 feet underwater, then drops steeply to the Santa Monica Basin at about 2,630 feet.

The Debris TMDL addresses nearshore and offshore Santa Monica Bay. Nearshore Santa Monica Bay is defined by the Ocean Plan as, within a zone bounded by the shoreline and a distance of 1,000 feet from the shoreline or the 30-foot contour, whichever is further from the shoreline. Offshore is defined as the waters between the nearshore zone and the limit of state waters. Lastly, state waters, according to section 13200 of the California Water Code, extend three nautical miles into the Pacific Oceanfrom the line of mean lower low water marking the seaward limits of inland waters and three nautical miles from the line of mean lower low water on the mainland and each offshore island.

The Santa Monica Bay watershed has an estimated population of 1,950,265 based on the 2000 U.S. Census. Open space represents the primary land use in the watershed (55%), while high-density residential areas represent the

largest developed area (25% ofthe total watershed). Low-density residential constitutes 5% of the land area. Commercial, industrial and mixed urban areas cover 10%. The remaining 5% of land area is covered by transportation (1.7%), educational institutions (1.6%), agriculture (0.8%), recreational uses (0.8%), public facilities and military installations (0.2%), and water (0.4%).

In general, the northern part of the Santa Monica Bay (northwest of Santa Monica subwatershed) is not as highly developed and urbanized as the southern part of the Bay (southeast of Santa Monica Canyon subwatershed). Subwatersheds in the northern part of the Bay have on average 85% of their land area in open space. Subwatersheds in the central and southern portion of the Bay have on average 16% of their area in open space.

Figure 1. Santa Monica Bay Watershed

2.2. Regulatory Background

The federal Clean Water Act of 1972 (CWA) requires states to develop a list of impaired waters and identify the pollutants for which they are impaired, also known as the 303(d) List. For each impairment, states must establish a watershed-based pollutant-specific Total Maximum Daily Load (TMDL) that will bring impaired water bodies into compliance with the water quality standards necessary for achieving designated beneficial uses of the water body. Santa Monica Bay Offshore/Nearshoreis listed by the State of California as impaired under Section 303(d) of the Federal Clean Water Act for the following water quality parameters: debris, fish consumption advisory, DDT, PCBs, and indicator bacteria.

On November 4, 2010 the Regional Board adopted an amendment to the Water Quality Control Plan for the Los Angeles Region (Basin Plan) incorporating a Total Maximum Daily Load for Debris in Santa Monica Bay Nearshore. The effective date of the Debris TMDL is March 20, 2012 and the TMRP is due for review by the Regional Board Executive Officer no later than September 20, 2012.

The Debris TMDL is based on the establishment of numeric targets, Waste Load Allocations (WLA) for point sources, and Load Allocations (LA) for nonpoint sources, a margin of safety, and implementation and compliance schedules for responsible agencies.

2.3. TMDL Provisions

Potential sources of debris in Santa Monica Bay are categorized either as point sources or non-point sources depending on the mechanism of transport to the lake. Storm drains that convey trash to the bay are considered point sources because the trash is deposited into the bay at a clearly identifiable point, i.e., the storm drain outfall. Nonpoint sources may result in the deposition of trash into the bay via a variety of mechanisms including: wind-blown trash from recreational and other land use areas in the immediate vicinity of the bay, scattering by vectors such as birds, conveyance via sheet flow during rain events, or direct dumping or littering into the bay. Both point sources and nonpoint sources are identified as sources of debris into Santa Monica Bay.

2.3.1.Waste Load Allocations

The agencies with land use responsibility for areas that drain to Santa Monica Bay via the storm drain system are assigned Waste Load Allocations under the Debris TMDL. These agencies are shown in Table 1.

Table 1. Santa Monica Bay Nearshore and Offshore Debris TMDL: Point Source Agencies

Agency	
• Caltrans • Los Angeles County • Agoura Hills • Calabasas • Culver City • El Segundo • Hermosa Beach • City of Los Angeles • Malibu • Manhattan Beach • Inglewood • West Hollywood	• Palos Verdes Estates • Rancho Palos Verdes • Redondo Beach • Rolling Hills • Rolling Hills Estates • Santa Monica • Torrance • Westlake Village • County of Ventura • Thousand Oaks • Beverly Hills

The Debris TMDL states that if point source dischargers comply with the WLAs by implementing a full capture system certified by the Regional Board Executive Officer on conveyances that discharge to Santa Monica Bay through a progressive implementation schedule, they will be deemed in compliance with the WLA. A full capture system is any device or series of devices that traps all particles retained by a 5 millimeter (mm) mesh screen and has a design treatment capacity of not less than the peak flow rate resulting from a one-year, one-hour storm in the sub drainage area. Responsible jurisdictions that choose to comply via a full capture system must demonstrate a phased implementation of full capture devices over an 8-year period until the final WLA of zero is attained. Beginning four years from the effective date of the TMDL, full capture systems must achieve 20% reduction of trash from the Baseline WLA, with 40% reduction in five years, 60% in six years, 80% in seven years and 100%

in eight years. Compliance with the percent reduction from the Baseline WLA is to be assumed wherever full capture systems are installed in corresponding percentages of the conveyance discharging to Santa Monica Bay with installation to be prioritized based on the greatest point source loadings. Zero will be deemed to have been met if full capture systems have been installed on all conveyances discharging to the Bay.

Responsible jurisdictions may alternatively comply with WLAs by implementing an MFAC/BMP program approved by the Executive Officer. MFAC protocols may be based on Surface Water Ambient Monitoring Program (SWAMP) protocols for rapid trash assessment, or alternative protocols proposed by dischargers and approved by the Executive Officer.

2.3.2. Load Allocations

The non-point source agencies within the watershed that are assigned Load Allocations under the Debris TMDL are shown, for reference, in Table 2. The Debris TMDL states that compliance with Load Allocations can be achieved by implementing a Minimum Frequency of Assessment and Collection Program (MFAC Program) in conjunction with a suite of Best Management Practices (BMPs), known as the MFAC/BMP program. The Debris TMDL further states that "responsible jurisdictions that are listed as both point and nonpoint sources will be deemed in compliance with both the WLAs and the LAs if an MFAC/BMP program, approved by the Executive Officer, is implemented.

Table 2. Santa Monica Bay Nearshore and Offshore Debris TMDL: Non-Point Source Agencies

Agency	
• California Department of Parks and Recreation • County of Los Angeles Department of Beaches and Harbors • Hermosa Beach	• City of Los Angeles • Santa Monica • Redondo Beach

The City of Los Angeles, as the jurisdiction responsible for the operation of the Venice Boardwalk, is assigned Load Allocations under Debris TMDL.

2.3.3. Numeric Targets

The narrative water quality objectives in the Basin Plan for floating material and solid, suspended or settleable materials are stated as:

> *"Waters shall not contain floating materials, including solids, liquids, foams, and scum, in concentrations that cause nuisance or adversely affect beneficial uses."*
>
> *"Waters shall not contain suspended or settleable material in concentrations that cause nuisance or adversely affect beneficial uses."*

In establishing the numeric targets for the Debris TMDL, the Regional Board interpreted/translated these narrative objectives into a numeric standard of zero (0) trash in Santa Monica Bay. The Regional Board also determined that a margin of safety is not necessary for the Debris TMDL, because this TMDL includes an implicit margin of safety as the WLAs and LAs have been set zero.

Zero trash is defined in the TMDL as:

1. For non-point sources: no trash immediately following each assessment and collection event consistent with an established Minimum Frequency of Assessment and Collection Program (MFAC)—the MFAC Program is established at an interval that prevents trash from accumulating in deleterious amounts that cause nuisance or adversely affect beneficial uses between collections; or
2. For point sources: no trash discharged into waterbodies within the Santa Monica Bay Watershed and into Santa Monica Bay or on the shoreline of Santa Monica Bay, which can be met by installing of full capture systems on conveyances that discharge to Santa Monica Bay through a progressive implementation schedule.

2.4. Monitoring and Reporting Plan Development

The Debris TMDL requires that responsible jurisdictions develop a Trash Monitoring and Reporting Plan (TMRP) that describes the methodologies that will be used to assess and monitor trash in the bay. Responsible jurisdictions implementing a full capture system and those implementing an MFAC program are both required to submit a TMRP within six months of the effective date of the TMDL.

Table 7-34.2, Santa Monica Bay Nearshore and Offshore Debris TMDL, lists a number of elements to be included in the TMRP, including:

- assessment and quantification of trash collected from source areas;
- provide details on the frequency, location, and reporting format;
- propose a metric to measure amount of trash discharged from their jurisdiction;
- prioritization of areas that have the highest trash generation rates;
- evaluate and identify the most appropriate BMPs to implement given the nature of trash; and
- evaluation of the effectiveness of the MFAC/BMP program and a revise MFAC, if required.

Additionally, responsible jurisdictions implementing full capture systems are to submit results of the TMRP, recommend trash baseline WLA and propose full capture system prioritizations within two years of receiving approval of the TMRP. However, depending on the method of compliance, full capture system or MFAC/BMP Program, some of the above elements will not be applicable to all responsible jurisdictions. Accordingly, the City of Los Angeles, as part of the Machado Lake Trash TMDL Jurisdictional Group, met with Regional Board staff during the development of similar TMRP for the lake to obtain the following clarification of the relevant requirements that would be applicable depending on method of compliance:

> Implementation of a full capture system presumes that compliance is achieved by the progressive installation of full capture devices on conveyances, so that recommending a trash baseline WLA for each jurisdiction responsible for point sources is unnecessary to establish compliance. Data collected in previous studies for trash generation rates based on land use as discussed in Chapter 2 can be utilized for prioritization of full capture devices installation. This interpretation is further supported by the discussion of implementation and compliance for full capture treatment Systems in the Santa Monica Bay Nearshore and Offshore Debris TMDL Staff Report and Basin Plan Amendment.

Section 3 of this TMRP describes the overarching trash monitoring and reporting considerations applicable to jurisdictions responsible for point source discharges to the bay, including existing trash generation rate studies and current technological/structural options for trash control BMPs. The City of Los Angeles, which has been assigned a WLA, under the Santa Monica Nearshore and Offshore Debris TMDL has provided a description of the implementation strategy to be used for compliance.

Section 4 of the TMRP describes the monitoring and reporting considerations applicable to non-point sources of trash to the bay and describes the MFAC/BMP Program to be implemented for non-point sources associated with the City of Los Angeles responsibilities, only.

3. Point Sources

3.1. Studies – Trash Generation Rates by Landuse

The focus of this Chapter is to present a description of the existing trash studies that have been conducted in the past by the Los Angeles County Department of Public Works (LACDPW), the City of Los Angeles, and Caltrans to address requirements for other Trash TMDLs within the Los Angeles Region, such as the LA River and Ballona Creek Trash TMDLs. These studies provide the necessary guidance to effectively implement the specified measures to comply with the Santa Monica Bay Nearshore and Offshore Debris TMDL requirements. Additional studies should not be necessary and their costs could be better applied towards the implementation efforts. The LACDPW and City of Los Angeles independent studies resulted in the prioritization of land use areas within the LA River and Ballona Creek watersheds based on their trash collection rates. Those studies will be used to formulate the implementation strategy for the City of Los Angeles land area within Santa Monica Bay Watershed.

The City of Los Angeles has also prepared a white paper study illustrating a geographical spatial distribution method of determining trash collection areas based on historical maintenance cleaning records regardless of landuse. This study will also be considered in developing the implementation strategy.

In addition, Caltrans has conducted a detailed study that resulted in developing performance data and recommendations for several trash control structural devices. Though this study focused on structural devices for use on freeways, the design and operational parameters used, as well as the results may be applicable to other structural devices currently available.

Finally, the Keep America Beautiful Litter Index Study has shown that institutional measures can significantly aid in the reduction of trash. Several jurisdictional cities impacted by this Trash TMDL already have proactive activities such as public outreach, street sweeping, and routine catch basin cleaning. These activities will continue to complement the structural measures that will be proposed for implementation to comply with the Santa Monica Bay Nearshore and Offshore Debris TMDL.

The City of Los Angeles is confident that the use of the existing studies by the LACDPW, City, and Caltrans will be adequate in shaping the implementation strategy and in ensuring compliance with the TMDL requirements. These studies will guide the appropriate selection of the structural trash control measures to achieve compliance and the appropriate landuse siting that will be the most beneficial to achieve a greater trash reduction rate. The narratives of each study below only provide brief synopsis of the purpose of the study, method of data collection, and resultant conclusions. The completed studies/data gathered are included in the appendix.

3.1.1. Existing Studies – County of Los Angeles

The County of Los Angeles Department of Public Works conducted trash data collection activities from October 15, 2002 to February 3, 2004 in response to the Los Angeles River and Ballona Creek Trash TMDL. The study was submitted to the Los Angeles Regional Water Quality Control Board (LARWQCB) on February 17, 2004 and may be provided upon request. The intent of the study was to collect data throughout the County catch basins (CBs) to supplement the one data point referenced in the LA River and Ballona Creek Trash TMDL. Consequently, at the conclusion of the data collection period the data provided information as to the different land uses and their trash collection trash amounts. The study generalized the two watersheds into five land use categories: high density single family residential (HDSFR), low density single family residential (LDSFR), commercial, industrial, and open space.

The study consisted of retrofitting CBs with basket inserts and installation of hydrodynamic devices downstream of the CBs catchment area to determine the amount of trash collected in that area. A total of 500 CBs were retrofitted with CB basket inserts and were equally distributed among the two watersheds. Each of the land use areas in the watersheds had CBs retrofitted and had a hydrodynamic device installed, for a total of 5 in the two watersheds.

The trash data collection was triggered by storm events having an accumulation 0.25 inches and a predetermined span between storms during the wet season and a set interval during the dry season. Trash collection consisted of manual (man-entry) cleaning of each insert found within the CB as well as mechanical cleaning of the hydrodynamic devices. The trash collected was further manually sorted into man-made trash and vegetation on site, and a volume (gallons) and mass (pounds) determined for each CB.

For the Los Angeles River watershed, the highest amount of litter generation (per unit area) was observed in the industrial land-use followed by commercial land-use. For Ballona Creek watershed, commercial land-use was found to be the single major generator of litter (per unit area). It was also determined that open space/parks land-use generated the most sediment/vegetation for both watersheds followed by the low-density single-family residential land-use.

3.1.2. Existing Studies – City of Los Angeles

Trash Generation Study

The City of Los Angeles Bureau of Sanitation, Watershed Protection Division, in 2002 prepared a Trash Generation Study to aid in the City's development of its implementation strategy for the Los Angeles River and Ballona Creek Trash TMDL.

Geographical Identification of Trash Collection in the City of Los Angeles

City staff has been able to identify the areas within the City of Los Angeles where disproportionate amount of trash is collected during routine catch basin cleaning through the use of Geographical Information System (GIS) software where various datasets were geographically portrayed.

The datasets used are those identified to be important indicators of trash collection throughout the City. Operational cleaning records for each city-owned catch basin were obtained from the City's storm system operations division. These records indicate the CB level of fullness as well as documenting its predominant content. The dataset contained CB cleaning history from January 1999 to June 2000. Using GIS software and spatially displaying the information illustrated areas that have the most trash deposited in catch basins. In 2004, the dataset was expanded to include information up to 2004 with similar findings resulting. Telephone hotline data on "Abandoned Trash/Bulky Items" and "Request for CB Cleaning" were also geographically displayed and overlaid with other trash indicator(s). The datasets contained records from July 1993 to March 2001. The Land Use Profile of the City was used to suggest possible correlation with the trash data.

The results of the analysis showed that rates of trash collection in the City of Los Angeles are most severe in the Downtown/Civic Center area of the City and nearby communities. The data gathered identified three distinct trash generation areas within the City, those being low(< 5 cubic feet/acre), medium (5-14 cubic feet/acre), and high (>14 cubic feet/acre). The high trash collection areas were found to be radiating for approximately 4 miles from Downtown, followed by the medium area that continued for the next 2 miles, and the low areas comprised the remaining areas of the City. The high trash collection area was shown to contribute approximately sixty percent of the total trash within the City. Figure 2 is a map showing graphically the amount of trash collected throughout the City based on the datasets described above.

The citywide land use profile reveals (Figure 3) that the Downtown/Civic Center area consists of mainly commercial and industrial land uses. Residential and commercial developments are seen in Westlake, West

Adams area, South Central and Southeast Los Angeles. These communities contribute to the majority of trash collected in catch basins. Furthermore, the summarized data in Table 3 show that the overwhelming majority (83%) of the full-trash catch basins in Downtown LA are associated with commercial and industrial land uses. In contrast, citywide only about half (52%) of the full catch basins were found in commercial and industrial areas.

Moreover, the study confirmed that highly populated and highly visited areas often time happen to be places that generate the most trash. Such pattern was observed for Westlake, Boyle Heights, Southeast and South Central Los Angeles with the majority of City population above 22,500 capita per square mile, according to 1990 U.S. Census. Communities with less population like Central City, certain parts of Hollywood and mid-Wilshire, are known to host many daytime businesses, tourist attractions, sidewalk retails and restaurants. These places also have significant daily visits, attract high vehicular and pedestrian traffic and are also found to be high trash-generation areas.

Table 3. Percent of full-trash CBs in various landuses

Landuse	Within Downtown	Outside Downtown	Citywide
Residential	6%	42%	36%
Commercial	46%	31%	33%
Industrial	27%	18%	19%
Utilities	1%	0%	0%
Transportation	5%	2%	3%
Open/Recreation	1%	2%	2%
Others	14%	6%	7%
TOTAL	100%	100%	100%

Available Institutional and Structural Controls

The City already prevents most of the illicitly generated trash from entering local waterbodies through various existing controls.The City through its institutional requirements and operations discourages the generation of illicit trash and collects the bulk of this trash from streets, sidewalks, alleys, and catch basins. These controls include anti-littering statutes found in the Municipal Code that include an enforcing mechanism. Street sweeping is an existing control accomplished by motorized sweepers to sweep streets and municipal parking lots. The frequency of sweeping varies from daily for selected commercial strips to monthly for the least urbanized portions of the City. Catch basin cleaning is conducted by the Department of Public Works Bureau of Sanitation. All city-owned CBs are cleaned on a yearly average of 3 times per year. CBs that quickly fill with trash are cleaned more often and more cleanings take place during late summer to early fall period.Abandoned trash is reported to the City's telephone hotline. Pick-ups are conducted by the Bureaus of Street Services and Sanitation.Trash receptacles maintained by the Bureau of Street Services and business improvement districts(BIDs) have reduced the amount of illicit trash along selected commercial strips. This practice reduces the amount of visible trash, thus making these commercial strips more attractive to customers.

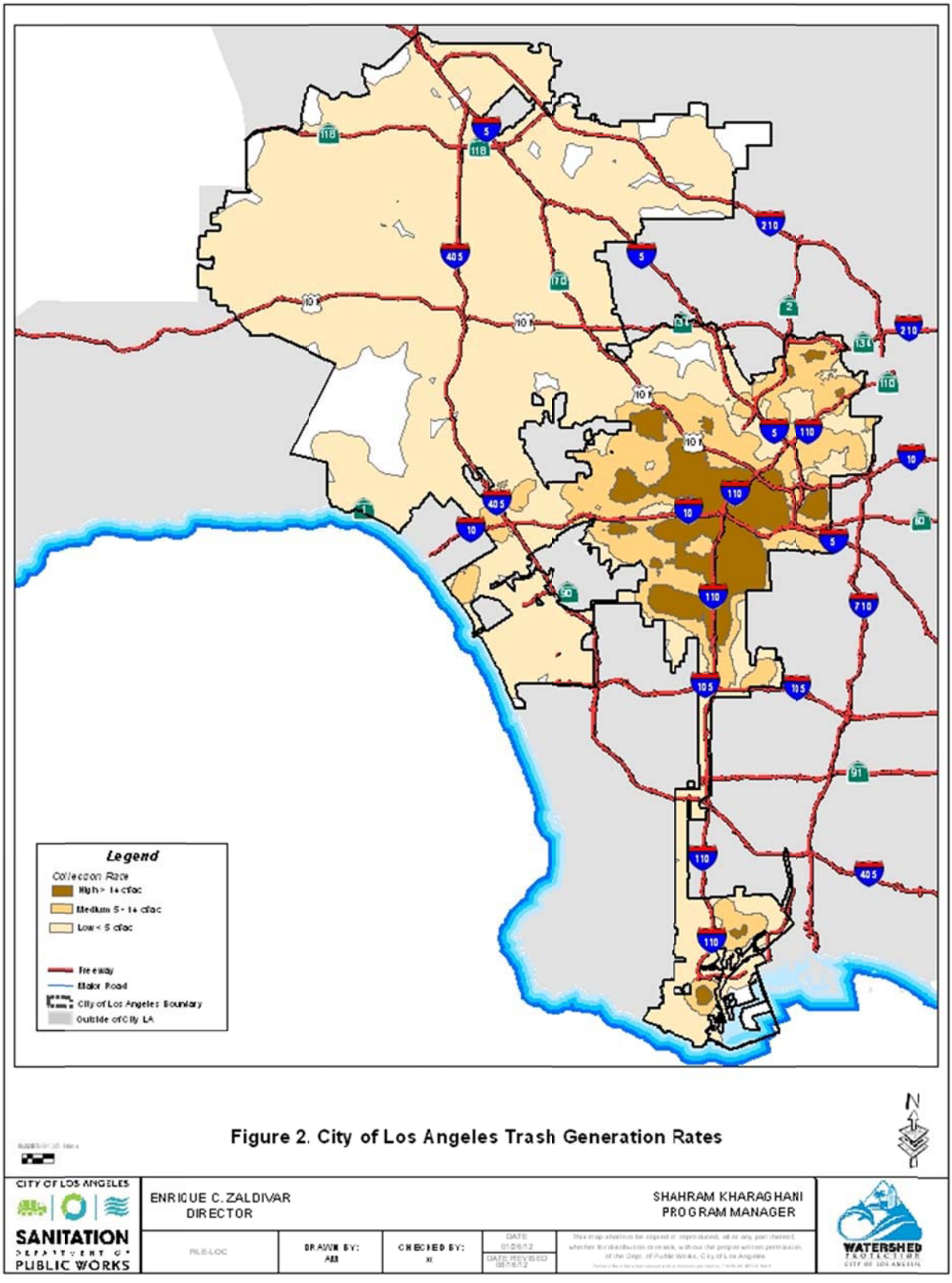


Figure 2. City of Los Angeles Trash Generation Rates

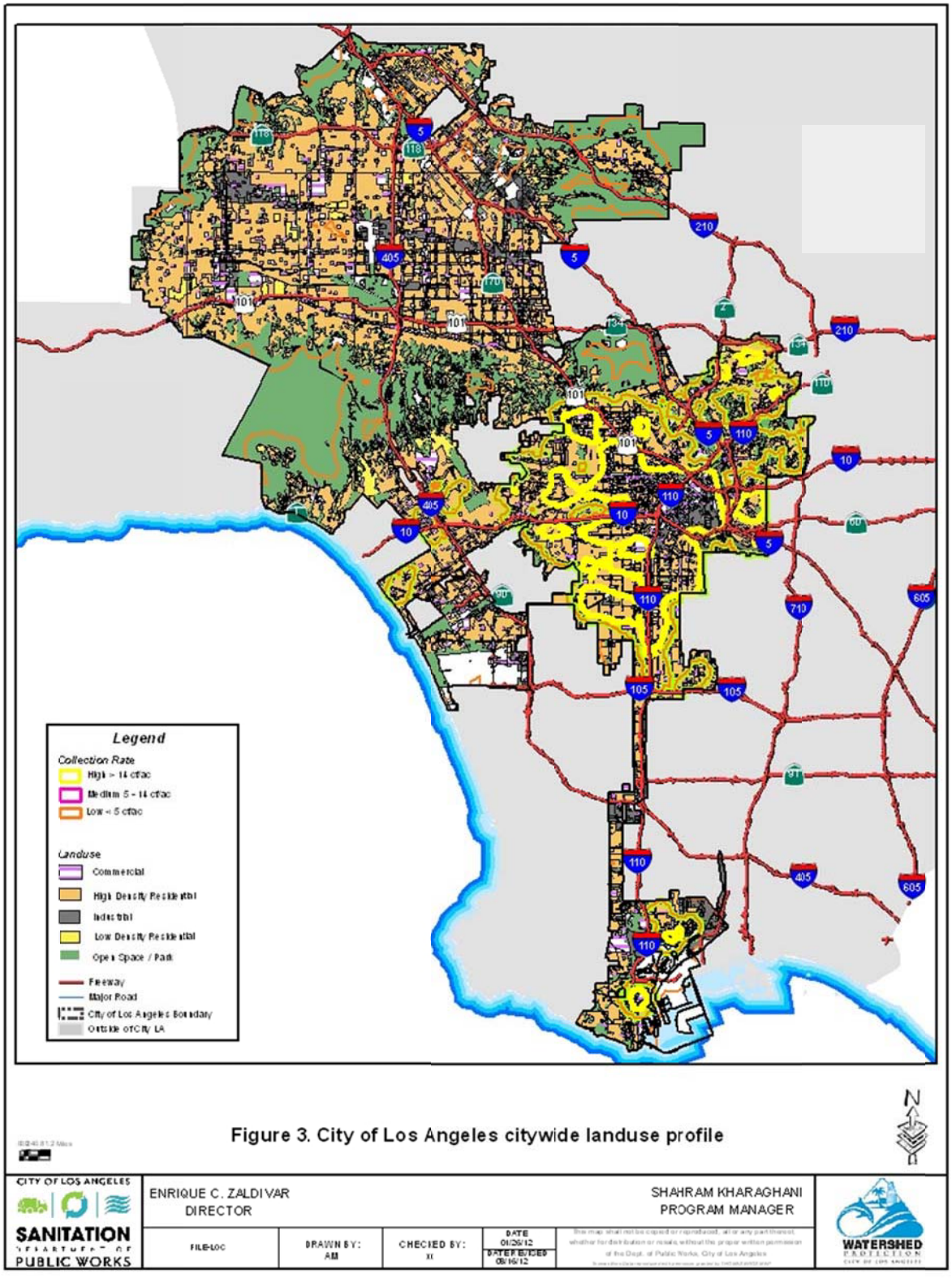


Figure 3. City of Los Angeles citywide landuse profile

Public outreach is an important factor already being employed by the City. Educational antilittering outreach efforts have been ongoing but recently have been emphasized to target storm water pollution. Community clean-up programs such as Operation Healthy Neighborhoods by the Mayor's Office or Operation Clean Sweep by the Department of Public Works have incorporated trash clean-up and litter reduction. These programs involve partnerships between the City, community activists and volunteers for joint effort to beautify the most affected communities.

There are a number of structural systems that can be installed on the stormwater system that can prevent the deposition of trash to local water bodies. These systems can be placed inside a CB and in storm drain lines to capture trash. These systems include: CB opening screen covers, CB inserts, netting systems, and hydrodynamic separation systems. Hydrodynamic separation systems use centrifugal force to separate solids from the storm flow for collection and disposal during routine maintenance. Netting systems are fabricated mesh connected to the storm drain line where floatable materials flowing through the storm flow are trapped in the mesh bags for disposal during routine maintenance. CB inserts are liners or baskets placed within the CB catchment area to retain floatable materials that enter the CB from the street storm water flow. CB opening covers are coarse screens placed at the opening of the CBs preventing floatable materials from the street storm flow from entering the CB catchment area. Other trash capture systems include screening vaults and end-of-pipe trash capture screens or cages.

The study has identified a number of additional measures that may be taken that will assist in the reduction of trash throughout the City. For a listing of these measures, refer to the complete study found in Appendix B.

Trash Control Strategy Development
The identification of the trash control measures and the overall trash reduction strategy requires the coordination and cooperation of multiple local agencies, private and non-profit institutions, and the general public. The study did not identify the specific trash control measures but rather provided a discussion for the selection of the control measure. It presented selection criteria, a team approach, and the framework to develop the trash control strategy. A technically-based approach to the selection of the trash control strategy can assist in meeting requirements while minimizing adverse impacts such as cost.

The study concluded with a brief discussion on a framework for selecting both institutional and structural controls. Selection of controls should be made on the effectiveness of the programs. The study recommended further assessment of these control through pilot programs where design parameters and obstacles could be assessed prior to full implementation city-wide. Other assessments would include contacting other municipalities to learn about their experience, as well as extrapolating from our current experience.

Prospective institutional controls have to be examined for implementability, compliance with regulations, public acceptance, and funding availability. The study recommended that these institutional controls be primarily studied and implemented in the high collection areas of the City.

Structural controls, such as CDS units and netting systems, were recommended to be installed only in the high collection areas of the City. In contrast catch basin-type systems, such as catch basin opening screen covers and inserts, can be placed along any areas known to generate trash, especially selected commercial, industrial and transportation strips or areas with high pedestrian traffic. For these structural controls the primary factors that will determine the selected type are cost and effectiveness.

<u>Trash Data Collection Study</u>
The City of Los Angeles Bureau of Sanitation, Watershed Protection Division, conducted trash data collection activities from May 31, 2003 to May 21, 2004 in the Los Angeles River and Ballona Creek Watersheds. Approximately 450 CBs were retrofitted in the high, medium and low trash areas of the City with horizontal inserts having 5-millimeter openings to determine the amount of trash captured by the inserts, in addition to the

total amount generated by those areas. Catch basin (CB) sites were established in each watershed, in five different land uses to determine their trash generation rates. Figure 4 shows the locations of these sites. Table 4 provides an itemization of the reporting sites and CBs per landuse, as well as per watershed. The land uses reported are commercial, industrial, high density residential, low density residential, and park areas.

Table 4. Distribution of Monitoring Sites and Catch Basins

a. Los Angeles River Watershed

Landuse	Monitoring Sites				Monitoring Catch Basins			
	Trash Collection Rates			Total	Trash Collection Rates			Total
	Low	Med	High		Low	Med	High	
Commercial	3	3	3	9	23	20	22	65
Industrial	3	3	3	9	21	20	17	58
High Density Residential	3	3	3	9	18	18	19	55
Low Density Residential	5	0	0	5	29	0	0	29
Park	1	1	2	4	7	3	13	23
Total	**15**	**10**	**11**	**36**	**98**	**61**	**71**	**230**

b. Ballona Creek Watershed

Landuse	Monitoring Sites				Monitoring Catch Basins			
	Trash Collection Rates			Total	Trash Collection Rates			Total
	Low	Med	High		Low	Med	High	
Commercial	3	3	3	9	24	16	19	59
Industrial	3	3	3	9	20	19	21	60
High Density Residential	3	3	3	9	21	18	21	60
Low Density Residential	3	0	1	4	18	0	5	23
Park	1	0	2	3	5	0	13	18
Total	**13**	**9**	**12**	**34**	**88**	**53**	**79**	**220**

Note:
1. The trash collection rates are defined as: low <3 cubic feet/acre; med 3-6 cubic feet/acre; high >6cubic ft/ac.

The 450 CB inserts installed were made of galvanized steel with 5 mm openings (Figure 5). The inserts occupy approximately 85 to 90 percent of the existing volume of the CB. The trash mobilized during a storm event was fully contained by the insert. This type of insert configuration was later on approved by the Regional Board as full capture device satisfying the requirements of the Trash TMDL.

The trash data reported included the entire contents of the CB which consisted of trash (man-made) and sediment/vegetation. No attempt was made during data collection to segregate these components into their respective weights or volumes. This decision was made with the intent of using the data from the LACDPW's study, described above, to establish a multiplier for each land use category, which would be used to determine the portion of man-made trash. Each CB was manually cleaned twice during the dry season and after every storm event greater than 0.25 inches during the wet season. The entire contents of the CBs were weighed on a portable scale on site. The contents were not dried, thus their weight includes significant moisture. Volumetric measurements were done on site using plastic bags of known volume.

The trash collection data is presented in the attached appendix. This data shows the amounts of debris (trash, sediment and vegetation) collected from the City's CBs for each monitoring site. It also provides the trash rate for each monitoring site and each landuse. This figure is calculated by dividing the values of total debris by the drainage area to each site times the established fraction of trash based on LACDPW's study.

At the conclusion of the reporting period, it was concluded that the high density residential and grouping of commercial/industrial land uses in both watersheds produced the highest amounts trash. This conclusion supports the LACDPW study described above.

These reporting activities further support the Trash Generation Study, where the City had identified areas within the City producing the most trash based on historical CB operational records for individual basins.

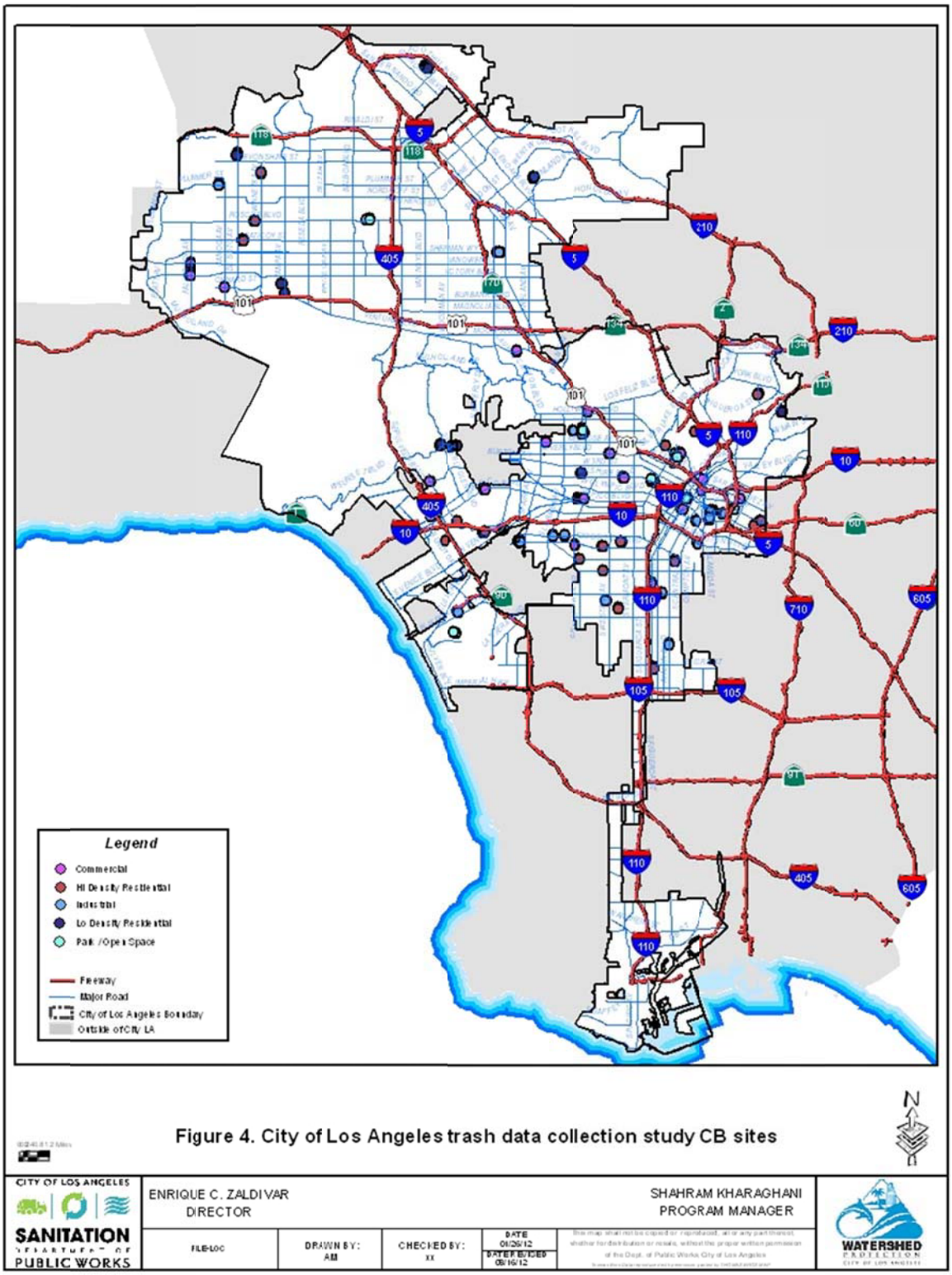


Figure 4. City of Los Angeles trash data collection study CB sites

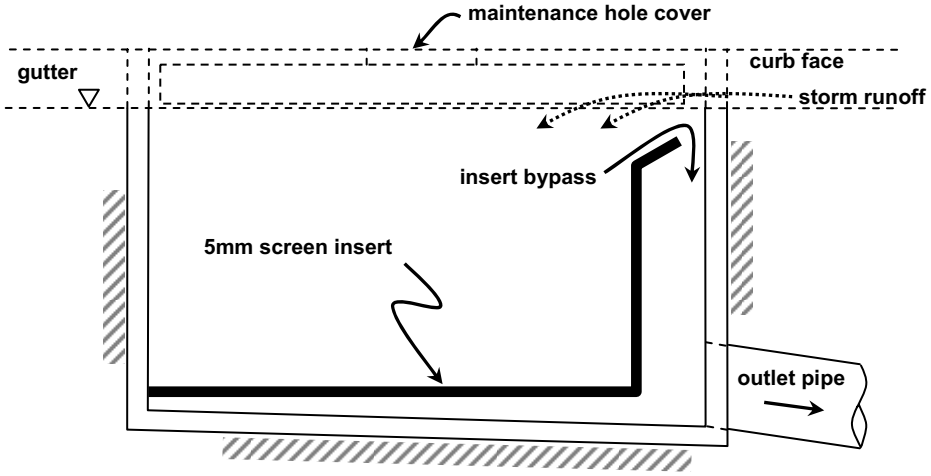


Figure 5. Typical City of Los Angeles trash insert installation used for trash collection determination

3.1.3. Existing Studies – California Department of Transportation (CalTrans)

The California Department of Transportation conducted a series of studies related to trash removal to assist its storm water program implementation. These studies can be categorized in three (3) main groups: structural BMPs, drain inlet cleaning and public education and outreach. A number of structural BMPs were tested in several pilot programs looking at the performance and engineering feasibility of various devices for use in the Caltrans' right of ways. In addition, several studies were performed to evaluate effectiveness of drain inlet (catch basin) cleaning in the State highway systems. Lastly, several programs were conducted to assess various approaches in public education and outreach and used in developing the Caltrans' "Don't Trash California" statewide Public Education Campaign. These studies and programs are listed below. Detailed descriptions of them can be obtained from the reference link provided.

Structural BMPs

Phase I Gross Solids Removal Devices Pilot Study: 2000-2002 Final Report
(CTSW-RT-03-072.31.22)
Phase I Gross Solids Removal Devices (GSRDs) Pilot Study to evaluate the performance of non-proprietary devices than can capture gross solids and can be implemented into highway drainage systems. Three design concepts developed for this pilot study were the Linear Radial, the Inclined Screen, and the Baffle Box. This Report was submitted to the Regional Board for review and approval of full capture device certification. As a result, two configurations in this report have been certified as full capture devices. See Fig. 6 and 7 below.

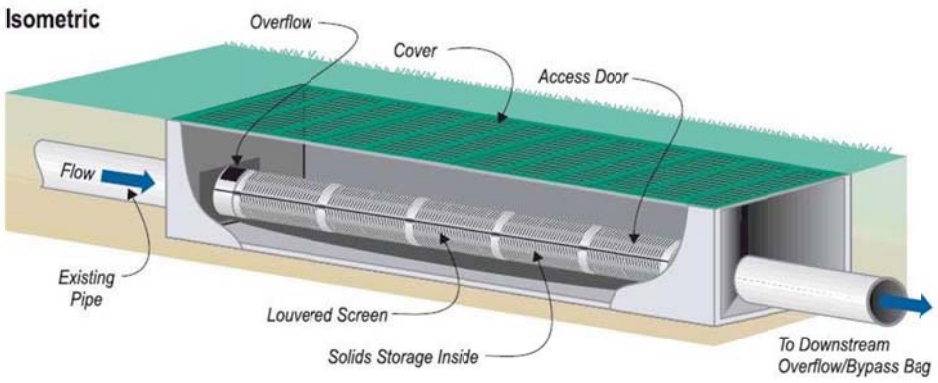


Figure 6. Concept Linear Radial Configuration No. 1

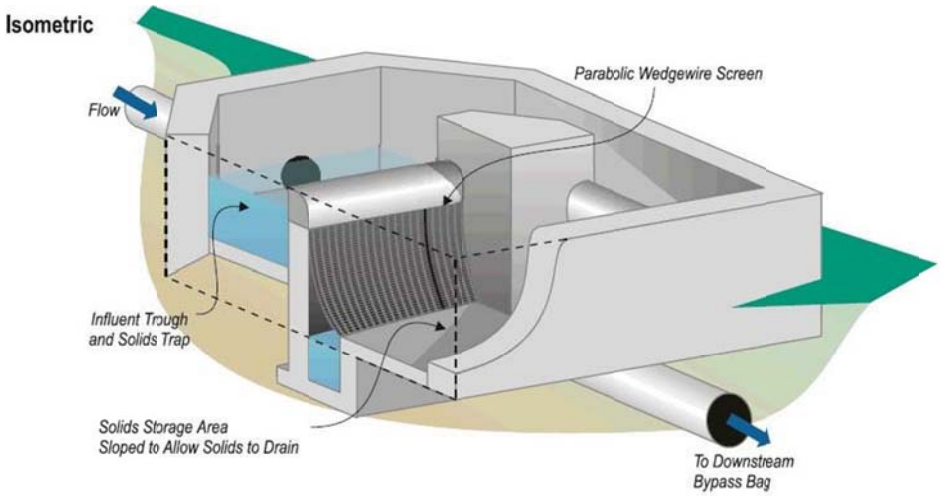


Figure 7. Concept Incline Screen Configuration No. 1

Phase II Gross Solids Removal Devices Pilot Study: 2001-2003 Final Report
November 2003(CTSW-RT-03-097.31.22)
Phase II GSRDs pilot study to evaluate the performance of one non-proprietary device that can capture gross solids and that can be retrofitted into existing highway drainage systems.

Phase III Gross Solids Removal Devices Pilot Study: 2002 – 2005
December 2005 (CTSW-RT-05-130.03.01)
Evaluates the performance of non-proprietary devices that can capture gross solids and that can be incorporated into existing highway drainage systems or implemented in future highway drainage systems.

Phase IV Gross Solids Removal Devices Pilot Study: 2004 – 2005
December 2005 (CTSW-RT-05-130.03.02)
Evaluates the performance of non-proprietary devices that can capture gross solids and that can be incorporated into existing highway drainage systems or implemented in future highway drainage systems.

Laboratory Testing of Gross Solids Removal Devices
May 2005 (CTSW-RT-05-73-18.1)
Details the results of tests to assess the performance of three alternative Gross Solids Removal Devices (GSRDs).

Caltrans Litter Management Pilot Study Final Report
(CTSW-RT-00-013)
June 2000 Summarizes the findings of the Litter Management Pilot Study (LMPS). The LMPS study investigated the effectiveness of structural and non-structural litter Best Management Practices (BMPs).

Drain Inlet Cleaning
Assessment of Drain Inlet Cleaning and Waste Disposal
November 2003 (CTSW-RT-03-091.51.43)
Assesses District 4 Vactor operations and BMPs for drain inlet cleaning, characterizes dry waste at decanting sites, assesses current decanting sites, and recommends placement and configuration of decanting sites and waste management.

Drain Inlet Cleaning Efficacy Study (DICE)

June 2003 (CTSW-RT-03-057.36.1)
Results of a study designed to determine whether drain inlet cleaning is effective as a BMP. Summary of multi-year drain inlet cleaning (DICE), solids transport and deposition study (STDS), and drain inlet and inspection and cleaning program (DIIC).

Public Education and Outreach
Survey of Fresno Area Residents Concerning Litter
April 2003 (CTSW-RT-03-044)
Follow-up to 2001 survey of Fresno, CA residents concerning measure of awareness, attitudes and behaviors relative to littering on roadways and highways.

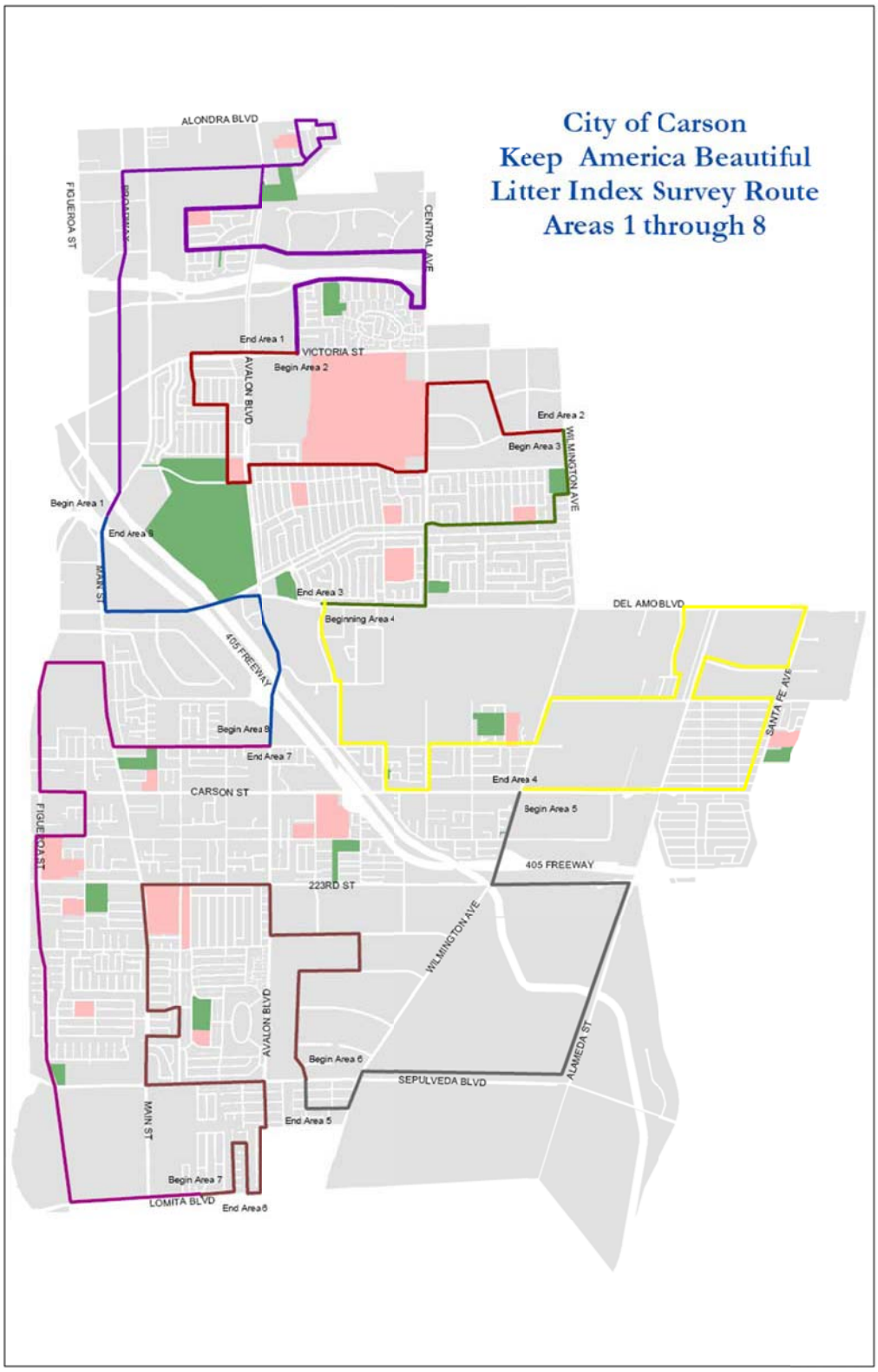
Caltrans Public Education Litter Monitoring Study 2001-2002
June 2002 (CTSW-RT-02-021)
Presents raw data and data summary for litter monitoring and characterization efforts during 2001-02 for the Fresno Public Education Litter Monitoring Study.
Additional details of the studies can be obtained at:
http://www.dot.ca.gov/hq/env/stormwater/special/newsetup/index.htm

Appendix E -Full capture certification for GSRDs

3.1.4.Existing Studies – Keep America Beautiful Litter Index Study

Keep America Beautiful, Inc. (KAB) is a non-profit grassroots organization with more than 50 years of successful history in litter prevention, beautification and community improvement, and waste reduction. Measurability and accountability are hallmarks of KAB and its affiliates. The cities of Los Angeles and Carson are affiliates of KAB and proudly wear the names Keep Los Angeles Beautiful and Keep Carson Beautiful, respectively.

The results of the KAB Litter Index provide a quick and reliable assessment of the litter situation in the community with the aim of achieving long-term, sustainable results. The Litter Index requires the affiliate to divide a map of the community into comparable, manageable areas, and then further divide those areas into sub-areas that will actually be scored. See Figure8 below.


City of Carson
Keep America Beautiful
Litter Index Survey Route
Areas 1 through 8
ALONDRA BLVD
FIGUEROA ST
BROADWAY
CENTRAL AVE
End Area 1
VICTORIA ST
Begin Area 2
AVALON BLVD
End Area 2
Begin Area 3
WILMINGTON AVE
Begin Area 1
End Area 8
MAIN ST
End Area 3
Beginning Area 4
DEL AMO BLVD
405 FREEWAY
Begin Area 8
End Area 7
SANTA FE AVE
End Area 4
CARSON ST
Begin Area 5
FIGUEROA ST
405 FREEWAY
223RD ST
WILMINGTON AVE
AVALON BLVD
ALAMEDA ST
Begin Area 6
SEPULVEDA BLVD
MAIN ST
End Area 5
Begin Area 7
LOMITA BLVD
End Area 6

n

Over time, comparisons of the Litter Index data can be used to identify what works locally to change attitudes and behaviors regarding litter and related community improvement issues and to evaluate the programs or practices already implemented.

With over 1000 local affiliates it's easy to spot trends in data such as where illegal dumping typically takes place or where litter is generated or sighted most often. For example, the City of Carson's litter index has repeatedly indicated that litter is highest in commercial areas and lowest in single family residential. See Table 5 below. Moreover, this particular trend is supported nationally.

Table 5. City of Carson Litter Index Study results

Area	Candace	Denny	Gladyce	Patricia	Overall Area Score	Primary Zoning
1	1.5	1.5	1.5	1.5	1.5	Single family residential
2	1.5	1.5	1.5	1.5	1.5	Single family residential
3	1	1	1	1	1	Single family residential
4	3	3	3	3	3	Commercial/Industrial
5	3	2.5	3	3	2.875	Commercial/Industrial
6	2.5	2	2	2	2.125	Commercial/Industrial
7	2.5	2	1.5	2	2	Mixed residential/commercial
8		4	3.5	4	4	

The above survey results are almost identical for 2005, 2006 and 2007.

Litter Scale: Written Descriptions

Score **1** - "No Litter"

Virtually no litter can be observed in the sub-area being scored. The scorer has to look hard to see any litter, perhaps a very occasional litter item or two in a city block, or equivalent. Any litter seen could be quickly collected by one individual. The entire sub-area has a generally neat and tidy appearance; nothing grabs the eye as being littered or messy.

Score **2** – "Slightly Littered"

Upon careful inspection, a small amount of litter is obvious to the scorer. The litter in the sub-area could be collected by one or two individuals in a short period of time. While the sub-area has a small amount of litter, the eye is not continually grabbed by litter items.

Score **3** – "Littered"

Visible litter can readily be seen throughout the sub-area, likely requiring an organized effort for removal. This area is "littered" and clearly needs to be addressed.

Score **4** - "Extremely Littered"

A continuous amount of litter level is one of the first things noticed about the sub-area. Major illegal dumpsites might be seen in the sub-area, requiring equipment and /or extra manpower for removal. There is a strong impression of a lack of concern about litter in the sub-area.

In reporting and evaluating the Litter Index results and in developing programs or practices for dealing with litter, defining and using common terms are important. For example, the term "single family residential" means the same to most organization regardless of the size of the parcel and it is preferred over the terms "low density residential" or "high density residential" because of the large discrepancy in zoning definitions from organization to organization. This discrepancy is exemplified in the Machado Lake Trash TMDL in that the single family residential areas of Carson within the Machado Lake watershed are zoned low density residential by the City of Carson's standard of 8 or less units per acre while, in contrast, the Machado Lake Trash TMDL defines low

density as 2 or less units per acre and therefore, by this definition, the City of Carson has only high-density residential within the Machado Lake watershed.

Results for the City of Los Angeles are similar to those of the City of Carson in that the commercial /industrial and high density residential areas have the highest amount of litter.

The KAB Litter Index is a valuable tool that can be used by affiliates and non-affiliates alike to prioritize the type and location of best management practices for implementation on both a local and regional level.

3.2. Comparison of Studies

Since the first Trash TMDL for the Los Angeles River and Ballona Creek Watersheds in 2001, many agencies have undertaken studies to determine the most cost effective approach to achieve compliance with the trash TMDL requirements. The LACDPW, City of Los Angeles, and Caltrans led the efforts in providing guidance to other municipalities in the region, state, and the nation in achieving compliance using cost effective strategies deploying both institutional and structural measures.

The LACDPW and City studies concluded that high density residential and combination of commercial/industrial landuse should be the priorities when initiating trash reduction measures. Both studies showed that most of the trash will be consistently collected in these land uses. It should be noted that this conclusion should not be misconstrued to infer that trash collection rates from these land uses are similar throughout a geographical region but that these land uses consistently generate the most trash.

The Caltrans studies have provided much needed performance, design, and operational data. The GSRDs and other treatment BMPs piloted in field conditions have shown the engineering feasibility to design structural devices to meet the definition of full capture devices found within the Trash TMDL documents but most importantly the limitations encountered. These limitations have included site and hydraulic constraints as well as the substantial construction cost to meet a small portion of the compliance milestones. In addition, these devices were designed and developed based on the needs and operations of the State Highways systems, primarily the freeways, therefore application of GSRDs and other treatment BMPs may not be suitable for the conditions of urban streets or other land uses. For these reasons, using local or site specific BMPs such as CB inserts and opening screen covers to address the requirements of the Trash TMDL may be more economical and effective for municipal sites.

Finally, the results of the Keep America Beautiful Litter Index Survey (an on-going study) which is performed by the cities of Los Angeles and Carson each year consistently confirm the results of the above described studies – the most trash is found in high density residential (as defined by cities) and commercial/industrial areas. Results for the City of Los Angeles are similar to those of the City of Carson in that the commercial /industrial and high density residential areas have the highest amount of litter.

3.3. Technological/Structural Options

3.3.1. Catch Basin Retrofits

Catch Basin Inserts

The catch basin inserts being deployed in the City of Los Angeles meet the Board's definition of a Full Capture Device as described in the Trash TMDL. Appendix F is the white paper analysis of the hydraulic capacity of the CB insert. The white paper concluded that the CB inserts used by the City, meet the Trash TMDL definition of a full capture system, specifically the inserts are manufactured of 5-millimeter perforated sheets and treat the storm flow of a 1-year, 1-hour storm. Appendix C is the pilot study conducted by the City during the 2005-2006 wet season reaffirming that the CB insert does meet the definition of a Full Capture Device in actual field conditions.

Catch Basin Screens
A pilot study on the effectiveness of catch basin opening screen covers in complying with the Trash TMDL was performed during the 2005-2006 wet season by the City of Los Angeles. At the conclusion of the study, the effectiveness of the covers during a storm greater than 0.25 inches was determined to be 58% to 79% percent. It should be noted that dry days in the City account for approximately ninety-three percent (93%) of the total calendar days. For dry days the effectiveness of the opening screen cover will be considered 85 percent, given that the screen will remain in the closed position and only trash smaller than one (1) inch can enter the catch basin. Therefore, using a 1:9.3 weighted average over an entire year, the opening screen cover has an 86 percent effectiveness rate.

3.3.2. In-line Devices

Hydrodynamic Separators
Hydrodynamic separators such as CDS units are considered by the RWQCB as full capture systems if designed to treat the one-year storm. The use of these "full-capture" devices on an existing storm drain system is very restrictive as concluded by the feasibility study conducted by the City of Los Angeles. Widespread installation of hydrodynamic devices in existing storm drain lines is not feasible due to the reasons of hydraulic head-loss, which would potentially cause flooding upstream, the cost of installation, as well as maintenance. Limited application on a case-by-case basis in high trash generation areas may be considered in smaller drains, but issues of constructability and operability would also need to be addressed.

Netting Systems
Netting systems can also be designed to meet the "full-capture" definition of the RWQCB. These systems, similarly to the hydrodynamic separators, have similar restraints for widespread application. Their installation may be considered on a limited basis for storm drain lines in the high trash generation areas.

3.4. Implementation Strategy

The City of Los Angeles which has been assigned a WLA under the Santa Monica Bay Nearshore and Offshore Debris TMDL has provided an implementation narrative below outlining its compliance strategy that includes both institutional and structural BMPs.

3.4.1. Institutional Measures

The City of Los Angeles through its institutional requirements and operations discourage the generation of illicit trash and collect the bulk of this trash from streets, sidewalks, alleys, and catch basins. These institutional and operations controls that have been employed will be optimized to maximize their effectiveness. The following are examples of institutional measures being performed.

- Anti-littering Enforcement
- Street sweeping
- Catch basin cleaning
- Trash Receptacles
- Educational anti-littering outreach
- Community clean-up programs

3.4.2. Structural Measures

The City of Los Angeles will pursue a dynamic, iterative plan of gradual implementation of both institutional and structural Best Management Practices (BMPs) to comply with the Santa Monica Bay Nearshore and Offshore Debris TMDL requirements. The plan involves utilizing existing low flow diversion structures along the bay and installing CB inserts and/or opening screen covers (depending of field conditions) in all CBs within the Los Angeles portion based on the schedule shown on Table 6. The existing low flow diversions structures are

operated year-round during periods of dry weather and are designed to a greater flow specifications than that required of *full capture devices* prescribed in the TMDL.

The Santa Monica Bay drainage area in the City of Los Angeles consists of low trash generating areas with 241 catch basins, as shown in Figure 9, falling outside the drainage areas of the existing low flow diversions. Los Angeles will start implementation in the trash collecting areas focusing on the commercial and high density residential (HDR) land use area contain within the area. See Figure 10.

Los Angeles will deploy selected structural devices to meet the compliance milestones of the Santa Monica Bay Nearshore and Offshore Debris TMDL. Los Angeles has tested over the past 7 years several CB inserts and opening screen covers and concluded that the vertical insert with 5-mm. openings and the flow activated opening screen covers are the best suited for implementation within the city to achieve compliance with Trash TMDLs.

Table 6. City of Los Angeles CB retrofit schedule to meet the Santa Monica Bay Nearshore and Offshore Debris TMDL.

Compliance Date	RWQCB Implementation Goal	City of LA CB Retrofits (cumulative by year)
Year 1 March 2016	20 %	**Opening Covers and/or Inserts** High Density Residential - 55 Commercial - 2 Total: **57**
Year 2 March 2017	40 %	**Opening Covers and/or Inserts** High Density Residential – 93 Commercial - 4 Total: **97**
Year 3 March 2018	60 %	**Opening Covers and/or Inserts** High Density Residential - 140 Commercial - 6 Total: **146**
Year 4 March 2019	80 %	**Opening Covers and/or Inserts** High Density Residential - 160 Commercial - 8 Open Space - 43 Total: **211**
Year 5 March 2020	100 %	**Opening Covers and/or Inserts** High Density Residential - 180 Commercial - 10 Open Space– 51 Total: **241**

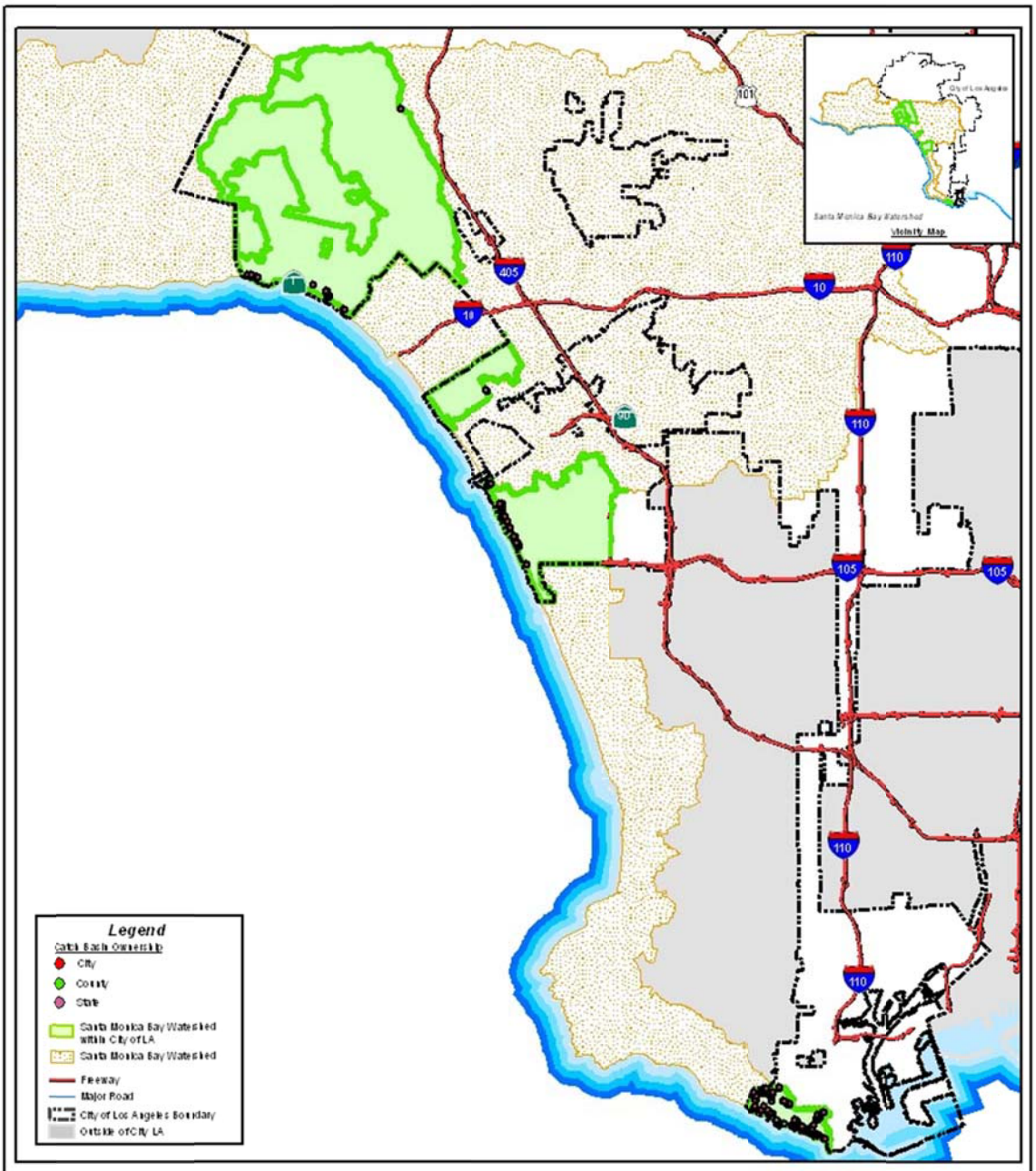


Figure 9. Catch Basins with no BMP in City of LA portion of Santa Monica Watershed

CITY OF LOS ANGELES
SANITATION
BUREAU OF PUBLIC WORKS

ENRIQUE C. ZALDIVAR
DIRECTOR

SHAHRAM KHARAGHANI
PROGRAM MANAGER

FILE-LOC	DRAWN BY:	CHECKED BY:	DATE: 01/26/12 DATE REVISED: 05/15/12
	AM	XI	

WATERSHED PROTECTION

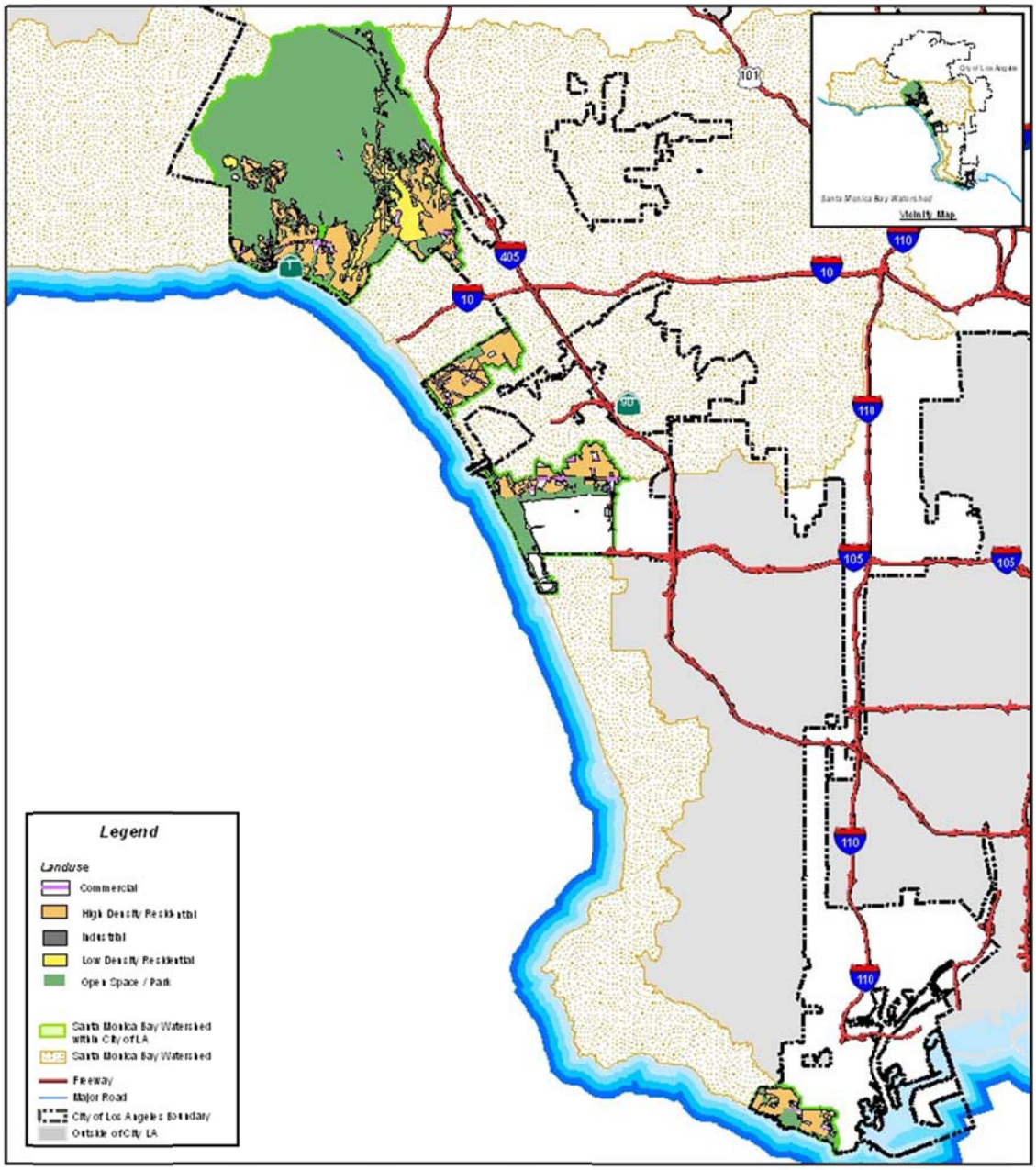


Figure 10. Landuse in City of LA portion of Santa Monica Watershed

CITY OF LOS ANGELES
SANITATION
DEPARTMENT OF
PUBLIC WORKS

ENRIQUE C. ZALDIVAR
DIRECTOR

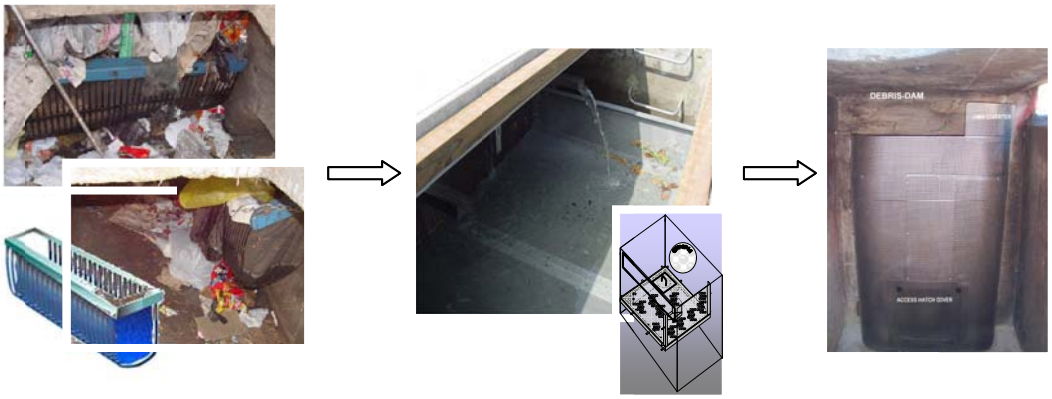
SHAHRAM KHARAGHANI
PROGRAM MANAGER

FILE-LOC	DRAWN BY:	CHECKED BY:	DATE
	AM	xx	01/26/12
			DATE REVISED 05/16/12

WATERSHED PROTECTION

Catch Basin Inserts

Los Angeles has explored several configurations of catch basin inserts in order to select one that meets the regulatory requirements and has minimal impact on the existing storm drain system. Figure 11 below shows the evolution of CB inserts that Los Angeles has investigated over the course of the last 5 years.



a) hanging basket **b) horizontal** **c) vertical**

As can be seen, Los Angeles has examined three distinct configurations of inserts. The hanging basket type was examined in pilot installations with discouraging results. The drawback of the basket insert is its limited volume for trash capture and the associated tedious maintenance requirements. Los Angeles did not proceed with extensive installations of this insert but opted to proceed with that of the horizontal and vertical insert that are described below.

The horizontal insert was considered because it addressed Los Angeles' concern for trash capture and maintenance. The inserts are manufactured from hot dipped galvanized steel screen sheets with 5 millimeter (0.197 inch) diameter circular openings. Inserts installed in curb opening catch basins encompass the entire width and approximately 85% of the entire length of the basin. An overflow is provided to alleviate hydraulic conditions from major rain events to ensure public safety. Those installed in grated inlets fit the entire opening. Los Angeles has installed several hundred of these inserts in the high trash areas and this is the type of insert used for the pilot study to determine its effectiveness. The pilot study concluded with recommendations to consider for future catch basin insert installations. Those recommendations were: maximize the trash capture area; minimize the flooding potential; optimize insert screen material openings; and ease of maintenance.

The vertical catch basin insert is the insert that Los Angeles is deploying in the high trash areas. This insert addresses all the recommendations made by the pilot study. The vertical insert maximizes the trash capture area by leaving most of the original catch basin containment volume intact. The absence of the horizontal screen floor has added several benefits: a.) it lessened the time of maintenance of the insert and catch basin; b.) it minimized flooding potential; and c.) it allowed for the vertical section of the insert to be larger in height. **Los Angeles will continue to deploy vertical inserts since their performance exceeds that of the horizontal insert evaluated in the pilot study.**

Catch Basin Opening Screen Covers

Los Angeles has explored several configurations of catch basin opening screen covers in order to select one that helps meet the regulatory requirements and has minimal impact on the existing storm drain system. Figure 12 below shows the evolution of CB opening screen covers that the City has investigated its use.

a) fixed **b) magnetic** **c) flow activated**

eles

As can be seen, Los Angeles has examined three distinct configurations of catch basin opening covers. The fixed type catch basin opening cover was examined only for limited installations. This type of insert was primarily installed for security reasons around the Convention Center during the 2000 Democratic Convention. The drawback of the fixed catch basin opening screen covers is the placement on the face of the curb and the ponding of flow during rain events. The placement on the curb face has led to destruction of these covers by the large wheel lug nuts found on commercial vehicles (i.e., buses, delivery vehicles). Los Angeles did not proceed with extensive installations of this opening screen cover but opted to proceed with that of the magnetic and flow activated opening screen covers described below.

The magnetic opening screen cover was considered because it addressed Los Angeles' concern for ponding during rain events. The opening screen covers were manufactured from hot dipped galvanized steel screen sheets with diamond shape openings (1 inch by 0.75 inch). The magnetic opening screen covers fit the entire catch basin curb opening. Los Angeles has installed several hundred of these inserts in the high trash areas and this is the type of insert used for the pilot study to determine effectiveness. The pilot study concluded with recommendations to improve the effectiveness of the CB opening screen covers. Currently, the horizontal inserts are no longer being installed in the City of Los Angeles.

The flow activated opening screen cover is the cover that addresses all the recommendations from the pilot study. Los Angeles is deploying that type of cover throughout the city. The flow activated opening screen cover maximizes the amount of trash kept on the street and minimizes flooding by allowing Los Angeles to set the trigger at which the screen would swing open. Additionally, the flow activated opening screen cover has circular perforations of only 0.75 inches, much smaller than those of the magnetic cover used in the pilot study. It has a dual locking mechanism that addresses the concern of large trash binding the cover in the open position. Installations of the flow activated opening screen covers are being recessed from the curb face (1 inches) to address the concern of large commercial vehicles destroying it and ensure it durability. **Los Angeles will continue to deploy flow activated opening screen covers since their performance exceeds that of the magnetic type.**

4. Non-Point Sources

4.1. Introduction

The Debris TMDL assigns Load Allocations for non-point sources of zero trash on the shoreline or beaches, or in harbors adjacent to Santa Monica Bay, immediately following each assessment and collection event consistent with an established Minimum Frequency of Assessment and Collection Program as to prevent trash from accumulating in deleterious amounts between collection events. The Load Allocations are assigned to the jurisdictions that own and/or manage beaches and harbors along Santa Monica Bay and include the California

Department of Parks and Recreation, the County of Los Angeles Department of Beaches and Harbors, and the Cities of Los Angeles, Santa Monica, and Redondo Beach.

Regional Board's Staff Report to the Debris TMDL identifies the owners and operators of the individual beaches along Santa Monica Bay. Will Rogers State Beach and Dockweiler State Beach are located within the boundaries of the City of Los Angeles but owned by the California Department of Parks and Recreation and maintained by the Los Angeles County Department of Beaches and Harbors. Venice Beach is also within the boundaries of the City of Los Angeles and is one of the most popular beach attractions of Santa Monica Bay with an estimated 16 million visitors per year. Venice Beach stretches for about 2.7 miles along the central part of Santa Monica Bay from Marine Street (Barnard Way) on the north with its border with the City of Santa Monica to Via Marina on the south at the ocean inlet to Marina Del Rey and Ballona Creek, and from Ocean Front Walk (also known as the Venice Boardwalk) that runs the entire length of the beach on the east to the western boundary of the City of Los Angeles at the mean high tide line of the Pacific Ocean. Figure 13 provides an overview of the geographic setting of Venice Beach, whereas sectional maps of Venice Beach and Ocean Front Walk are provided in Figure 14 to 16.

The City of Los Angeles through its Department of Recreation and Parks (RAP) has jurisdiction over Venice Beach as described above by authority of City ordinance (No. 63,869). However, operations of the sandy beach portion of the park are the responsibility of the Los Angeles County Department of Beaches and Harbors (County) through an operating agreement established in 1975 and as amended in 1987. The County Department of Public Works actually grooms the sand to remove trash and debris. RAP maintains all other developed areas along the entire length of OFW, including all landscaped areas and Windward Plaza located between North Venice Boulevard and Horizon Avenue. Windward Plaza has a majority of the active recreational facilities at Venice Beach, including the famous Muscle Beach area, recreation courts (paddle tennis, basketball, volleyball, and handball), children's play areas, the skate park and skate dance area, the Graffiti Wall, and bike path (Figure 17). RAP also maintains trash collection at six restroom facilities located along OFW. The County maintains the parking lots at Washington Boulevard/Venice Pier, North Venice Boulevard, and Rose Avenue, as well as the Lifeguard Headquarters just south of the North Venice Boulevard parking lot. Venice Pier located at Washington Boulevard is maintained by RAP.

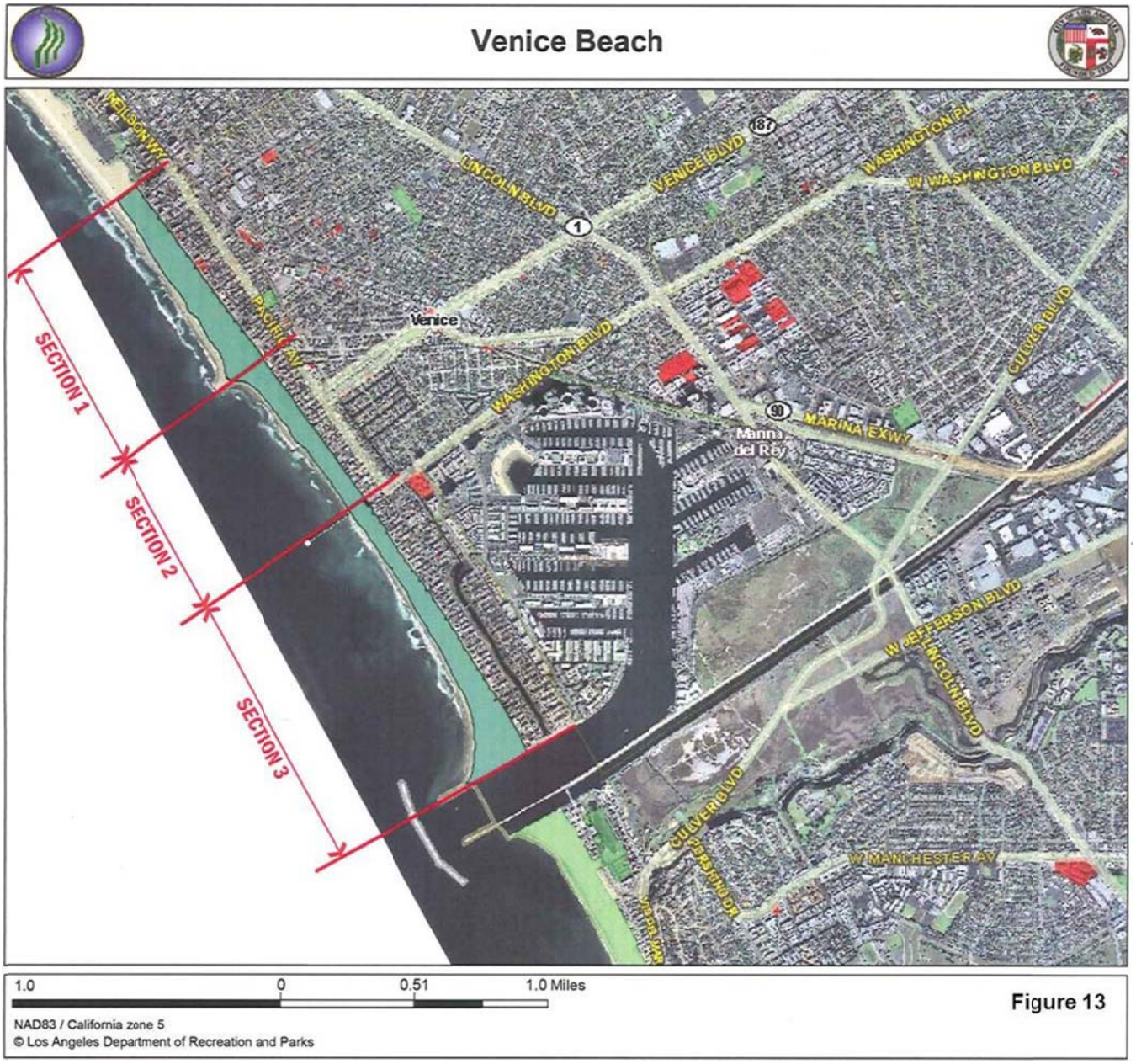

Venice Beach
WILSON WY
LINCOLN BLVD
VENICE BLVD
187
WASHINGTON PL
W WASHINGTON BLVD
1
PACIFIC AV
Venice
WASHINGTON BLVD
CULVER BLVD
90
MARINA EXWY
Marina del Rey
SECTION 1
SECTION 2
SECTION 3
W JEFFERSON BLVD
LINCOLN BLVD
CULVER BLVD
PERSHING DR
W MANCHESTER AV
1.0
0
0.51
1.0 Miles
NAD83 / California zone 5
© Los Angeles Department of Recreation and Parks

Figure 13

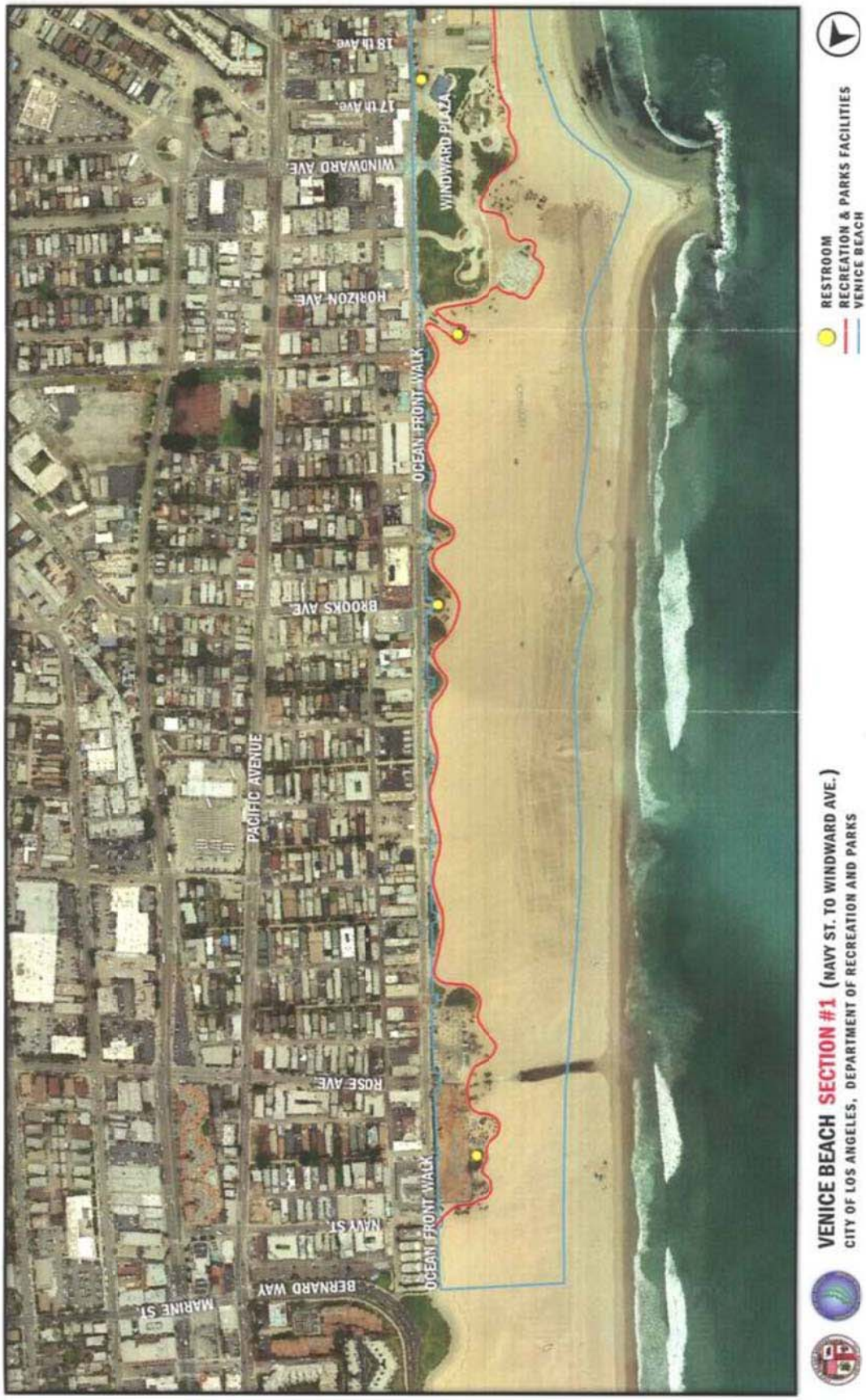


Figure 14. Venice Beach Section 1 - Navy Street to Windward Avenue

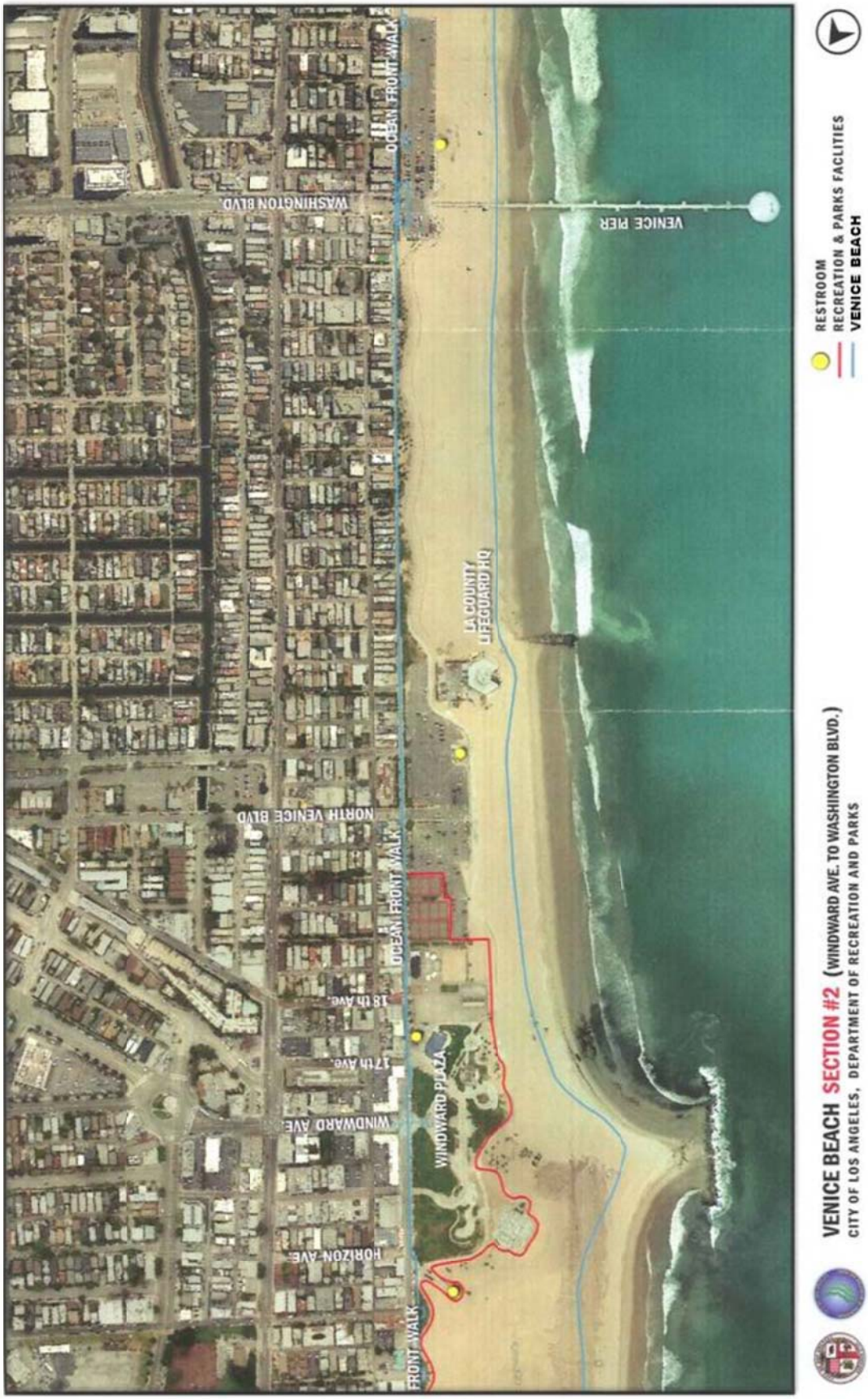


Figure 15. Venice Beach Section 2 - Windward Avenue to Washington Boulevard

Figure 16. Venice Beach Section 3 - Washington Boulevard/Venice Pier to Via Marina

As RAP is primary jurisdiction responsible for maintaining the developed areas of Venice Beach, the Minimum Frequency of Assessment and Collection Program described in this Section 4 primarily addresses trash non-point sources of the Ocean Front Walk and associated recreational facilities.

4.2. Existing Conditions

RAP has comprehensive program in place for trash collection and street sweeping of the Ocean Front Walk and recreational facilities and maintenance of the landscaped areas:

- On average, a crew of three staff collects trash seven days a week along Ocean Front Walk, regardless of the weather conditions. RAP also has community volunteers through local organizations and court-referrals who perform hand removal of litter on a daily basis as availability permits. There are 167 fixed-in-place 32-gallon plastic-lined trash receptacles at Windward Plaza and along OFW from North Venice Blvd. to Rose Ave. In addition, there are another 12 portable blue recycling bins at Windward Plaza, and 67 portable green-painted 55gallon drum trash receptacles located at Venice Pier, the various recreation courts at Windward Plaza, Venice Beach Skate Park, and the six restroom facilities located at Washington Boulevard/Venice Pier, North Venice Boulevard, Windward Plaza (2), Horizon Avenue, Brooks Avenue, and Rose Avenue. Table 7 provides a breakdown of the locations of trash receptacles at the various locations.
- Mechanical sweeping of the Ocean Front Walk and Windward Plaza is performed on a daily basis to capture errant trash and litter.
- RAP also is responsible for removing and/or disposing of materials from homeless people at the beach consistent with required legal procedures.

- RAP provides additional trash receptacles and collections as needed for RAP-sponsored special events. Trash collection for special events by non-profit groups and other organizations are managed through the terms and conditions of the required use permit.
- The turf in the developed recreation area along Ocean Front Walk and at Windward Plaza is mowed once a week. Grass clippings are left on the turf as natural mulch. Palm fronds are collected by hand and transported to RAP's green waste composting facility for conversion to mulch for use throughout the City park system.

Table 7. Trash Receptacles along Ocean Front Walk and Recreational Facilities.

Location	55 Gallon	32 Gallon
Winward Plaza Restrooms and Recreation Courts	14	
Skate park / Graffiti Wall	12	
Washington Avenue / Venice Pier Restroom	20	
Washington to North Venice (OFW)	13	
North Venice Blvd Restroom	2	
Horizon / Brooks / Rose Restrooms	6	
Winward Plaza Playground and Police Sub-Station		5
Winward Plaza		8
Ocean Front Walk from N. Venice Blvd. to Rose Ave.		154
Recycling Bins (Winward Plaza)	12	
TOTAL	79	167

Trash collected from all 234 trash receptacles, as well as litter collections, are deposited in a City Bureau of Sanitation trash truck for disposal at a nearby transfer station and ultimately into a landfill. The entire daily collection process takes on average about 3-4 hours during the peak summer months and 2 hours in the winter when beach use declines. The County accumulates trash and debris for collection and disposal by the City on an as need basis as part of their grooming of the sands along the entire length of the beach.

4.3. TMDL Targets, Load Allocations, and Monitoring Requirements

The Debris TMDL defines the numeric target and load allocation (LA) for Santa Monica Bay non-point sources as "no trash on the shoreline or beaches, or in harbors adjacent to Santa Monica Bay, immediately following each assessment and collection event consistent with an established Minimum Frequency of Assessment and Collection Program (MFAC Program). The MFAC Program is established at an interval that prevents trash from accumulating in deleterious amounts that cause nuisance or adversely affect beneficial uses between collections. Pursuant to Water Code section 13269, waste discharge requirements are waived for any responsible jurisdiction that implements a MFAC/Best Management Practices (BMP) Program which, to the satisfaction of the [LARWQCB] Executive Officer, meets the following criteria:

- The MFAC/BMP Program includes an initial minimum frequency of trash assessment and collection and suite of structural and/or non-structural BMPs. The MFAC/BMP Program shall include and disposal of all trash found in the source areas and along the shoreline. Responsible jurisdictions shall implement an initial suite of BMPs based on current trash management practices to waterbodies within the Santa Monica Bay WMA and Santa Monica Bay.
- The MFAC/BMP Program includes assurances that it will be implemented by the responsible jurisdictions.

- The TMRP includes a MFAC/BMP Program, and a requirement that the responsible jurisdictions will self-report any non-compliance with its provisions. The results and report of the TMRP must be submitted to the Regional Board on an annual basis.
- MFAC protocols may be based on SWAMP protocols for rapid assessment, or alternative protocols proposed by dischargers and approved by the Executive Officer of the Regional Board.
- Implementation of the MFAC/BMP Program should include and Health and Safety Plan to protect personnel. The MFAC/BMP Program shall not require responsible jurisdictions to access and collect trash from areas where access by personnel is prohibited.

4.4. Implementation Strategy for Obtaining Targets

To meet the numeric targets and stay within the load allocations, the following MFAC/BMP Program will be implemented by RAP:

Structural BMPs

- (None)

Non-Structural BMPs

- 246 trash cans will be maintained in their present configuration.
- Installation of signs directing the public to place their trash in the proper trash receptacles.
- Coordinate shoreline monitoring between City and County of Los Angeles
- Volunteer Beach Cleanups (maintain log).
- Special Events Permits for large events requiring a maintenance fee to ensure event will be staffed with enough maintenance staff to minimize shoreline trash levels.
- Possible installation of "Big Belly" trash compactors in high traffic areas.

MFAC Program:

- Initial minimum frequency of trash assessment and collection of seven days per week on the Ocean Front Walk and in the recreational developed areas along Ocean Front Walk.
- Mechanical sweeping of paved surfaces of Ocean Front Walk and recreational areas, also seven days per week.

Trash collection and mechanical sweeping is from 6:00am to 10:00am during summer months, and from 6:00am to 8:30am during winter months. Minimum frequency of trash assessment and collection will be adjusted during the TMRP period as point-source BMPs begin to decrease the need for such frequent trash collection from the lake and the shoreline.