

CITY OF LOS ANGELES



SANITATION
DEPARTMENT OF
PUBLIC WORKS

WATERSHED PROTECTION DIVISION
DEPARTMENT OF PUBLIC WORKS
BUREAU OF SANITATION
CITY OF LOS ANGELES

City of Los Angeles
Trash TMDL Implementation Strategy and Plan
for the Los Angeles River and Ballona Creek Watersheds

The Present



The Future



City of Los Angeles Trash TMDL Implementation Strategy and Plan for the Los Angeles River and Ballona Creek Watersheds

EXECUTIVE SUMMARY

INTRODUCTION

This report outlines the City of Los Angeles' (City) Trash Total Maximum Daily Load (TMDL) Implementation Strategy and Plan for the Los Angeles River and Ballona Creek Watersheds. The City will pursue a dynamic, iterative plan of gradual implementation of both institutional and structural Best Management Practices (BMPs) to comply with the Trash TMDL requirements. The plan involves implementing selected BMPs, analyzing their performance, and expanding their implementation accordingly. The City's strategy focuses initially on the high trash generation areas of the City followed by the medium and low trash generation areas.

BACKGROUND

In compliance with the Federal Clean Water Act and existing consent decree between the U.S. Environmental Protection Agency (USEPA) and environmental groups, the Los Angeles Regional Water Quality Control Board (RWQCB) approved the Trash TMDLs for the Los Angeles River (LA River) and Ballona Creek Watersheds on September 19, 2001. Beginning in 2003, the City is mandated by these Trash TMDLs to reduce 10% per year of the City's trash contribution to these waterbodies for a ten-year period, with zero trash discharge achieved by 2015. The RWQCB has based compliance on a three-year rolling average, with the first milestone in September 2006 when the City must achieve a 20% trash reduction. In addition, on August 1, 2001 the City Council expressed a commitment to trash reduction by endorsing the use of BMPs currently available to reduce trash by 60% in the LA River and Ballona Creek Waterbodies by September 2009. The following table represents the RWQCB Trash TMDL Implementation Schedule for both the Los Angeles River and Ballona Creek Watersheds.

Trash TMDL Implementation Schedule

Compliance Period	RWQCB Implementation Goal	Compliance Measurement (based on a rolling 3-year average)
Years 1 and 2	Baseline monitoring	
Year 3 10/03 – 9/04	90 %	No Compliance Point
Year 4 10/04 – 9/05	80 %	No Compliance Point
Year 5 10/05 – 9/06	70 %	80 %
Year 6 10/06 – 9/07	60 %	70 %
Year 7 10/07 – 9/08	50 %	60 %
Year 8 10/08 – 9/09	40 %	50 %
Year 9 10/09 – 9/10	30 %	40 %
Year 10 10/10 – 9/11	20 %	30 %
Year 11 10/11 – 9/12	10 %	20 %
Year 12 10/12 – 9/13	0 %	10 %
Year 13 10/13 – 9/14	0 %	3.3 %
Year 14 10/14 – 9/15	0 %	0 %

** Implementation Goal and Compliance Measurement reported as a percentage of the trash baseline waste load allocation.*

IMPLEMENTATION OVERVIEW

The Bureau of Sanitation’s Watershed Protection Division (WPD) has developed an implementation strategy for compliance with the Trash TMDL utilizing the following two-prong approach: 1) implementing institutional type controls, such as, public outreach, street sweeping, catch basin cleaning, and enforcement, and 2) installing structural trash control devices in the storm drain system, targeting first the highest trash generating areas of the City, followed by the medium and low trash generating areas. These structural devices include catch basin (CB) inserts, CB opening screen covers, netting systems, and hydrodynamic devices.

There are approximately 34,000 City-owned catch basins in the Los Angeles River and Ballona Creek Watersheds; however, this CB count is from the City storm drain database system that is constantly being updated with new construction modifications and field-generated corrections. In addition, there are approximately 20,000 Caltrans and County-owned catch basins located within the City's boundaries in the Los Angeles River and Ballona Creek Watersheds. Since the Trash TMDL requires zero trash discharge from the City's storm drain system, WPD has started to coordinate with these agencies to implement the necessary measures to control trash discharges from these CBs to the LA River and Ballona Creek.

STRATEGIC PLAN

This section highlights past studies and pilot projects that have influenced WPD's Trash TMDL Implementation Strategy, discusses current trash reduction operations and structural controls, and outlines the future plan to reach full compliance with the Trash TMDL.

The following definitions are used in this report:

Full Capture System: any project that uses any single device or series of devices that traps all particles retained by a 5 mm mesh screen and has a design treatment capacity of not less than the peak flow rate (Q) resulting from a one-year, one-hour, storm in the sub-drainage area.

Trash: for this report, "trash" is defined as sediment, debris, vegetation and litter and should not be misconstrued to represent only anthropogenic trash.

Institutional BMP: characterized as behavioral controls to reduce trash in the watershed prior to being discharged into the storm drain system or operational controls to reduce trash discharges to the receiving water bodies.

Structural BMP: a physical device that is retrofitted into the City's existing storm drain system, thus modifying the physical and hydraulic characteristics of the system.

TRASH STUDY

In January 2002, WPD completed a study entitled "High Trash Generation Areas and Control Measures", which identified the spatial distribution of trash in the City for the LA River and Ballona Creek watersheds. WPD conducted this study on trash generation areas within the City to assist with the selection and placement of BMPs. The study examined the amount of trash accumulating in the City's catch basins and resulted in three different trash generation areas within the City as shown in Figure 1. The trash generation areas were defined as High, Medium, and Low, where High trash areas generate more than 14 cubic feet of trash per acre, Medium areas generate between 5 – 14 cubic feet/acre, and Low areas generate less than 5 cubic feet/acre of trash. The study identified that a relatively small part of the City generates the majority of the trash and that trash generation rates are not necessarily dependent of land use type. Targeting this small part of the City with effective BMPs can result in a significant trash reduction for the entire City.

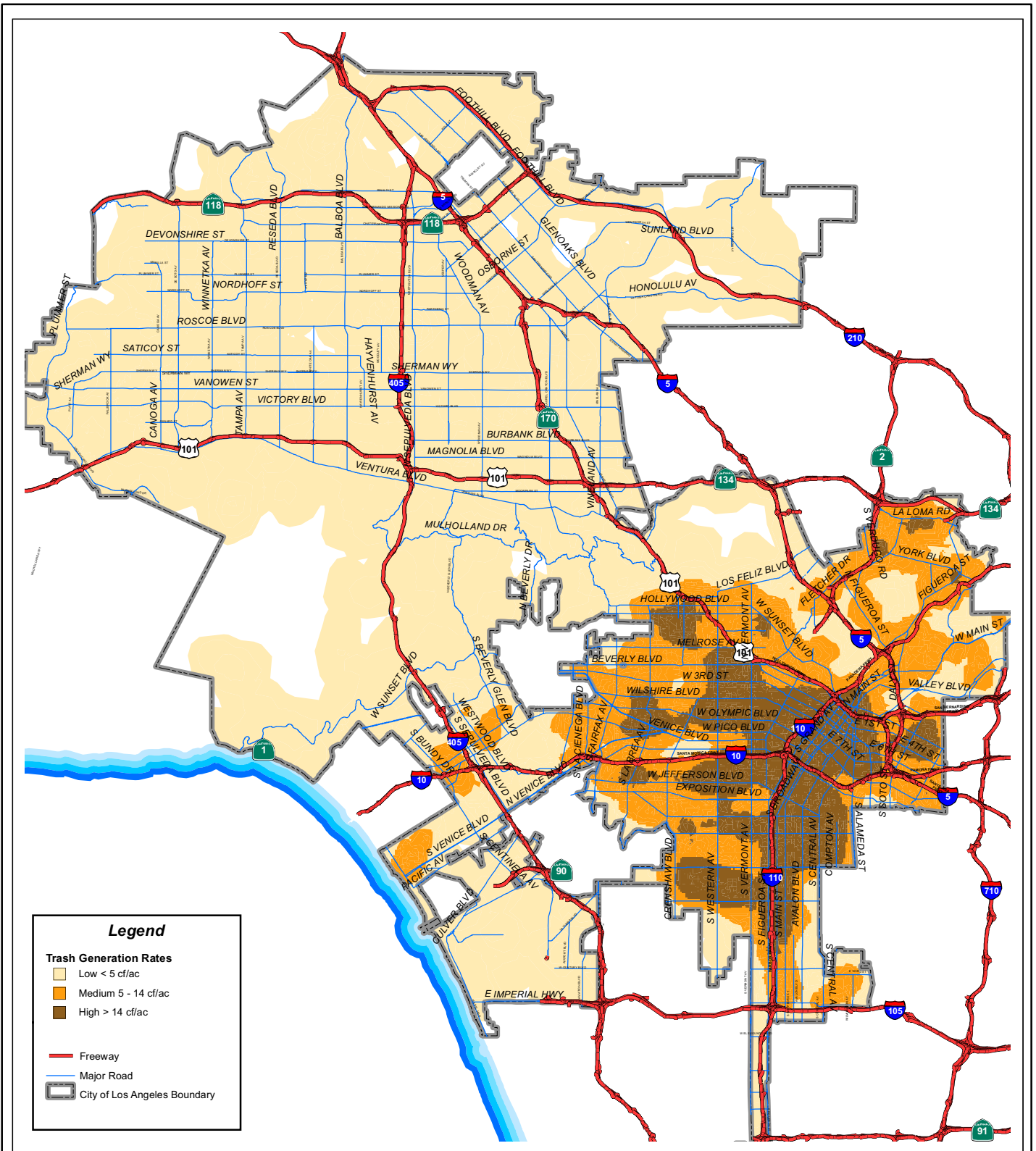


Figure 1. City of Los Angeles Trash Generation Areas

PILOT STUDIES

In August 2001, the City Council expressed a commitment to reduce trash in the Los Angeles River and Ballona Creek and endorsed the utilization of best efforts currently available to reduce trash by 60% by September 2009. As part of this effort the Bureau of Sanitation (BOS) led a working group of numerous City departments in conducting a number of pilot studies to evaluate the effectiveness of structural and institutional BMPs. The pilot studies were grouped into six areas that included the evaluation of structural and institutional controls and the following is a brief overview of the findings:

Structural Controls:

- 1) End-of-pipe trash systems: These barriers/baskets placed at the outlet of a storm drain in the Los Angeles River were moderately effective in capturing trash and debris at the river outlets. The screen opening size (5mm), as tested, proved to be problematic in clogging during rain events; thus a larger screen size was recommended. In addition, installation at the LA River outlets was determined to be difficult due to space limitations and maintenance accessibility.
- 2) Catch basin opening screen covers: These screens installed on curb opening catch basins did an effective job preventing trash from entering the storm drain system; however, they may cause local flooding on the street during moderate to severe rain events. Future applications should provide for alternative mechanisms for opening the cover during heavy rains and be used as appropriate with other BMPs to maximize trash capture.
- 3) Catch basin inserts: The insert type tested was limited in effectiveness due to the limited capacity for trash capture and the clogging of the geotextile liner from sediment. Future insert installations should maximize the capacity of the insert trash capture and increase the insert openings to prevent clogging.
- 4) Hydrodynamic Separator Devices (i.e., CDS, full capture devices): Installing these devices in the existing City storm drain system proved problematic due to the hydraulic losses; therefore, the use of these types of structural BMPs will be on a case-by-case basis where hydraulically feasible.

Institutional Controls – overall, it was hard to quantify the effectiveness of institutional control measures; however, the following conclusions were drawn:

- 1) Trash receptacles: Effectiveness was dependent upon placement location. Future use should consider land use and combination BMP trains.
- 2) Public outreach program (Rubbish Rebels): The study determined that local neighborhoods perceived trash as less of a concern than the local beach communities. Future applications will rely on mass media advertising.

CURRENT IMPLEMENTATION MEASURES

Based on the results of the above studies, the City determined that the best approach for the reduction of trash in the City is to target the high trash generation areas. Those areas will receive a more focused public outreach and structural BMPs. Many of the selected BMPs will be used either independent or in tandem with each other to achieve the targeted reduction of the amount of trash that is discharged into the Los Angeles River and Ballona Creek. The amount of trash

reduced can be calculated by assuming that full capture structural controls remove all the trash and by studying and evaluating the effectiveness of partial capture treatment systems installed and institutional control measures deployed. The Plan is based on retrofitting first the high trash generation areas with structural BMPs to achieve an early significant trash reduction of the City's overall contribution of trash to the receiving water bodies.

INSTITUTIONAL BMPS

Through current institutional requirements and operations, the City discourages the generation of illicit trash and collects the bulk of this trash from streets, sidewalks, alleys, and catch basins. These institutional BMPs that the City employs will be optimized to maximize their effectiveness and target identified high trash areas. The following describes the institutional BMPs the City currently performs:

Anti-Littering Enforcement of statutes such as Sections 56.08, 57.21.06, 62.54, 66.04, 66.25, and 64.70.02 of the Los Angeles Municipal Code (LAMC) forbid littering in the City of Los Angeles. The Los Angeles Police Department is the leading entity in enforcing LAMC requirements; however, other entities such as the Department of Public Works and Department of Recreation and Parks also deploy inspectors to prevent littering along city streets or in public parks, respectively.

Street Sweeping is conducted by the Bureau of Street Services (BOSS) using motorized sweepers to sweep streets and by the Department of General Services for municipal parking lots. The frequency of sweeping varies from daily for selected commercial strips to monthly for the least urbanized portions of the City, usually dependent upon the amount of trash.

Catch Basin Cleaning is conducted by the Wastewater Collection Services Division of the Bureau of Sanitation. At a minimum, the catch basin cleaning complies with the Stormwater NPDES Permit requirements, which range from once to four times per year depending on the CB location. Scheduling the cleaning of catch basins located in problematic areas will take place prior to forecasted significant storm events.

Abandoned Trash in streets and alleys is reported to BOSS and also WPD's hotline and upon referral; the BOSS conducts the clean-ups.

Trash Receptacles maintained by the BOSS have reduced the amount of illicit trash along selected commercial strips.

Educational Anti-Littering Outreach is conducted by the WPD's anti-pollution public education section in collaboration with the LA County and CalTrans. Citizens are encouraged to properly dispose of trash through postings, signs, billboards, television and radio advertisement.

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 to beautify the most affected communities.

Business Improvement Districts (BIDs) along commercial strips have been successful in reducing trash along sidewalks. Most of the existing 30 BIDs in the City incorporate sidewalk sweeping, litter pick-up, and maintenance of trash receptacles, which reduces the amount of visible trash, thus making these commercial strips more attractive to customers.

Los Angeles River Plastics Industry Task Force was formed in February 2005 under the direction of the City Council to address the problem of plastics (specifically plastic bags, Styrofoam cups, and plastic bottles) littering the River and to provide recommendations on solutions. BOS led a Task Force consisting of 23 members representing various City departments, environmental groups, local agencies, and the plastics industries. After Council adoption of their final recommendations in September 2005, the Task Force has been pursuing the implementation of the following recommendations: 1) support the establishment of an “Adopt-A-River Program”; 2) establish a uniform City-wide public education message and anti-litter effort for plastic bags; 3) implement a pilot anti-litter program in identified trash hot spot areas to assess the integration of engineered solutions with public education; and 4) foster market development for recycled plastic bags.

STRUCTURAL BMPS

Since 1999, WPD has been piloting different structural BMPs to reduce trash in the City’s storm drain system. These BMPs have been installed in the catch basins and storm drain lines to capture trash and include the following devices:

Hydrodynamic Separators, such as CDS and Vortech units, are considered by the RWQCB as full capture systems when designed to treat the one-year, one-hour storm. The use of these devices on the existing City’s storm drain system is very restrictive due to the hydraulic headloss that may potentially cause upstream flooding. Refer to Figure 2 for the location the City has installed these devices.



CDS Unit

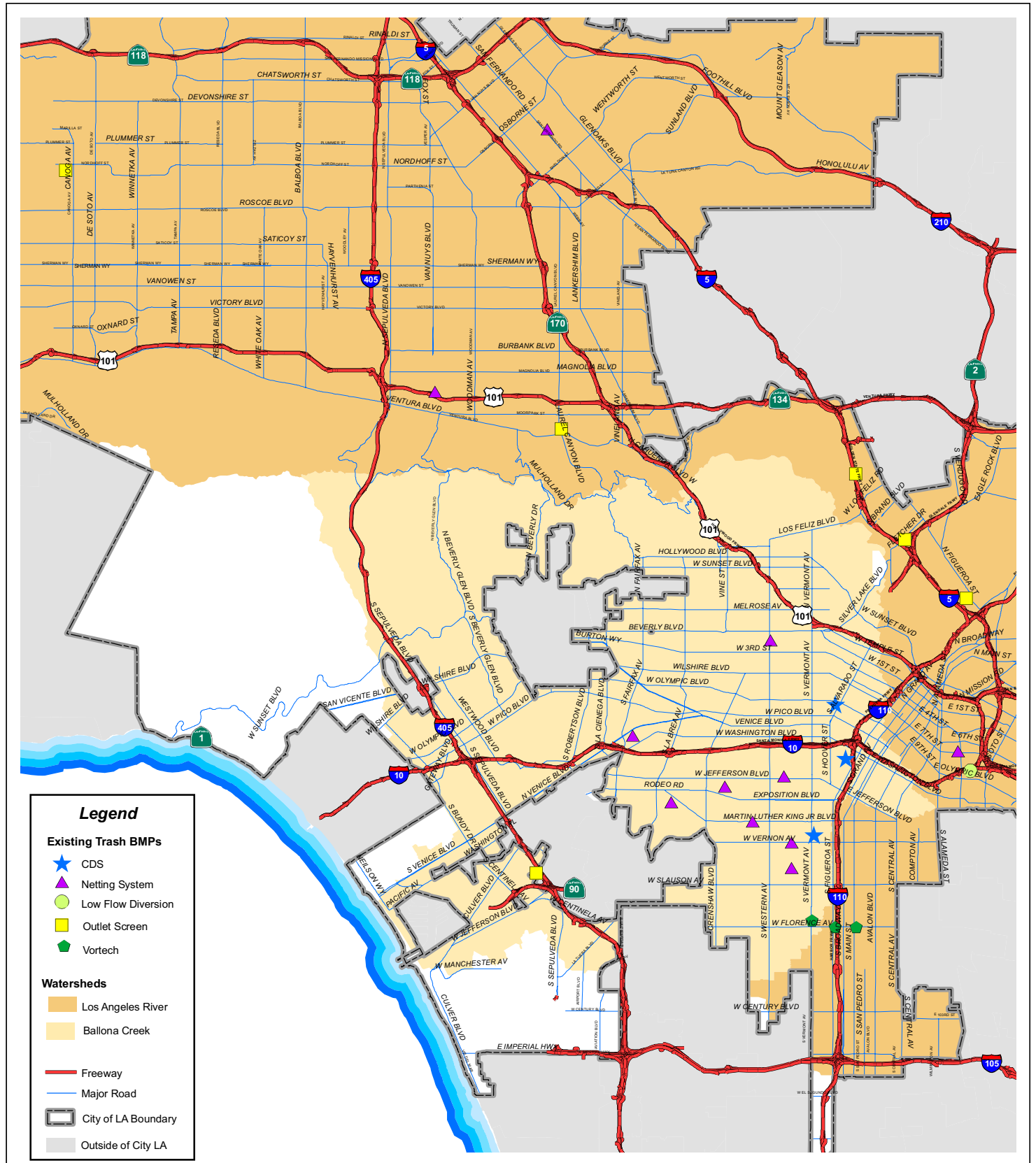
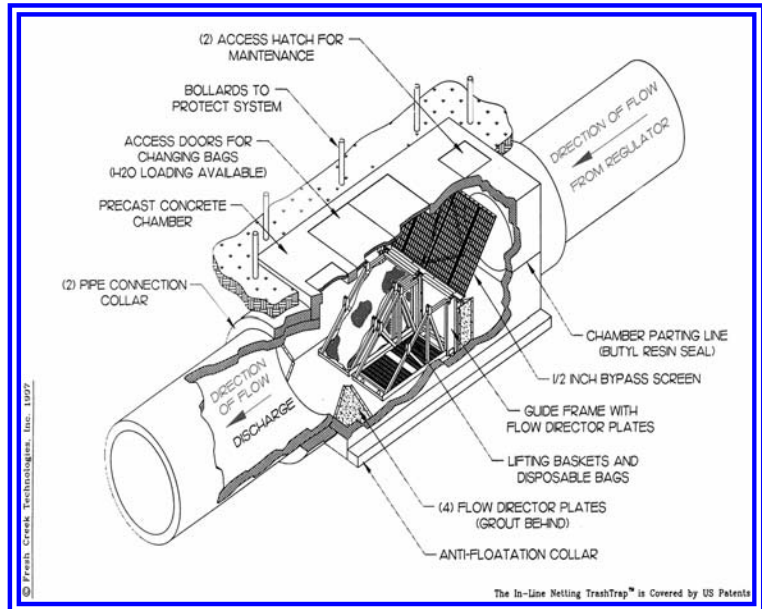
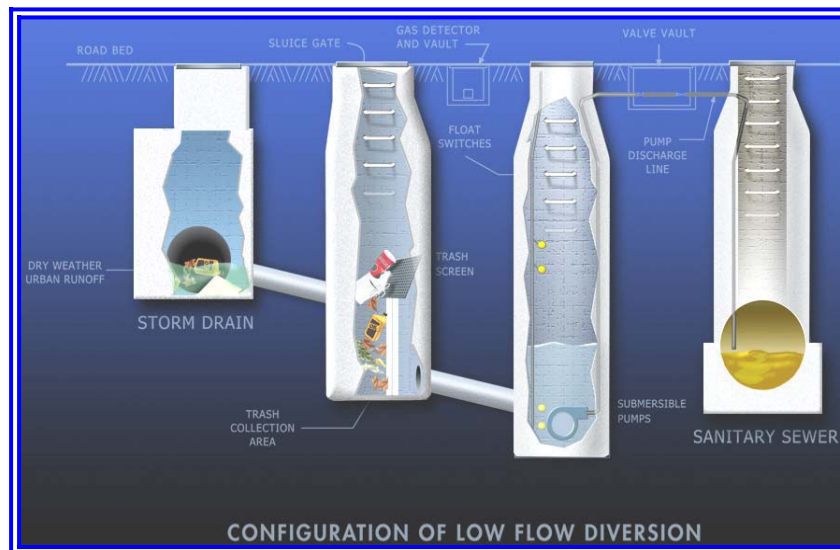


Figure 2. City of Los Angeles Structural BMP Locations

Netting Systems, such as Fresh Creek and P.J. Hannah, are a floatable collection system consisting of a fabricated mesh connected to the storm drain line and can be designed to meet the “full-capture” definition of the RWQCB. The floatable trash flowing in the storm drain is trapped in the disposable mesh bags. The Netting Trash Traps may be connected in three different ways: In-Line, End-of-Pipe and Floating. These systems, similar to the Hydrodynamic Separators, can introduce significant headlosses; therefore, installations were considered on a limited basis for storm drains in the high trash generation areas of the City. Refer to Figure 2 for locations.



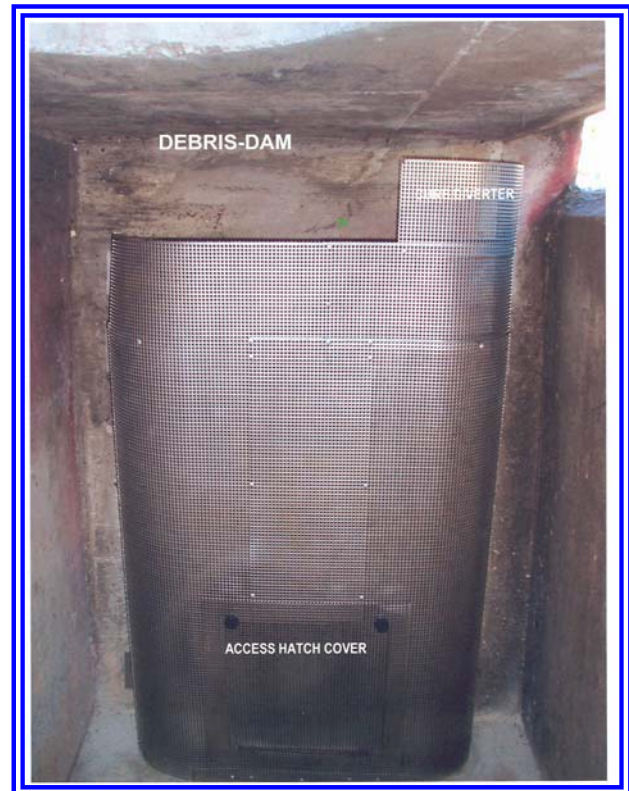
Low Flow Diversion (LFD) is a structural device that routes dry-weather urban runoff from canyons, streets, and small watersheds away from the storm drain system or waterway, and directs it into the sanitary sewer system. This device treats all types of pollutants, including trash, since the runoff is treated at a Wastewater Treatment Facility. The City has installed several of these devices in the Santa Monica Bay Watershed; however, only one LFD to date has been installed in the downtown high trash generation area. Refer to Figure 2 for location.



End-of-Pipe Trash Systems are screens or baskets installed at the end of the stormdrain as it discharges into the LA River or Ballona Creek. Several devices were installed by the City on a limited basis. See Figure 2 for the locations.



Catch Basin Inserts are designed to trap all trash greater than 5mm in size and installed inside the catch basin. These inserts maximize the catch basin's trash capture volume and consist of metal insert screening devices with either a vertical or horizontal configuration. These devices also provide a flow bypass to prevent flooding. The City's Strategic Plan to comply with the Trash TMDL includes installation of CB Inserts in all the City's high trash generation areas.



Catch Basin Opening Covers consists of a coarse screen placed at the opening of the catch basins to prevent trash from getting into the catch basin and ultimately being carried to the waterbodies through the storm drain system. The City uses covers that employ different devices (i.e., magnets, counter-balance troughs, etc.) that allow the covers to be self-opening when water builds up in front of the screen, thus preventing local flooding conditions. These covers remain in the closed position during dry weather and small to moderate storms, thus allowing street sweepers to collect the trash retained along the curb. Catch Basin Opening Covers are currently being installed in combination with the CB Inserts in all the high trash generation areas. In addition, they will be installed in the medium and low trash generation areas of the City over the course of the next 3 to 5 years.



FUTURE IMPLEMENTATION MEASURES

INSTITUTIONAL BMPS

The City of Los Angeles will continue to implement the fore mentioned Institutional BMPs and will periodically monitor these programs to ensure maximum effectiveness. Areas of the City that are retrofitted with Structural BMPs may require adjustments in current catch basin and street cleaning practices and schedules to ensure the prompt removal of trash; therefore, routine coordination with Bureau of Street Services and Wastewater Collection Services Division is anticipated. Public Education and Outreach efforts have generally been citywide; however in order to support this strategic plan, future efforts will be more targeted to groups such as the “Rubbish Rebels” groups and in areas of known high trash generation.

STRUCTURAL BMPS

WPD has divided installation of Structural BMPs into two phases. Phase I of the City's Plan involves installation of Hydrodynamic Separators, Netting Systems in key locations, and installation of CB Inserts and Covers in the high trash generation areas. Completion of Phase I is scheduled for the Fall of 2006 (see Figure 3). Phase II of the plan includes installation of CB Opening Covers in the medium and low trash generation areas of the City (see Figure 4). This phase may also include additional Hydrodynamic Separators and/or Netting Systems, if warranted.

The RWQCB is continuing the development and approval of more TMDLs for various pollutants, such as bacteria and metals, in the Los Angeles River and Ballona Creek Watersheds. With the creation of new regulations comes the development of new technology. As such, WPD will continue to conduct pilot projects to test new BMP systems for applicable trash and possibly multi-pollutant removal.

CALTRANS & COUNTY CATCH BASINS

In the County of Los Angeles, the storm drain system is a separate piping network that drains to the LA River, Ballona Creek, and Dominguez Channel, as compared to the sewer system that connects to the wastewater treatment facilities. This storm drain system was not built with individual city boundaries in consideration; therefore, County-owned, State-owned, and City-owned catch basins and storm drain pipes are interwoven/interconnected throughout the City of Los Angeles. For example, County-owned catch basins drain into City-owned storm drain pipes and vice-versa. This condition has required a very high degree of inter-agency coordination to implement the Trash TMDL. There are approximately 5,500 Caltrans-owned CBs in the City of Los Angeles (4,500 are located in the LA River and Ballona Creek Watersheds) of which approximately 1300 are located in the City's right-of-way and the rest are on the freeways. The maintenance of Caltrans CBs located in the City's right-of-way has been transferred to the City. The City is planning to sponsor the installation of BMPs in these CBs per the above-mentioned strategies.

There are approximately 20,000 County-owned CBs located in the City of Los Angeles, of which approximately 9,700 and 5,600 CBs respectively are located in the Los Angeles River and Ballona Creek Watersheds. The County of Los Angeles Department of Public Works (County) has completed installation of approximately 500 and committed to retrofitting 200 County-owned CBs located in the City with "Trash Excluders," which are a type of catch basin opening cover. WPD coordinated with County staff on locating these structural devices in the high trash generation areas of the City to complement the City's strategy. The installation of these CB Covers is scheduled to commence in July 2006. WPD staff will continue to work with County staff to complete installation of "Trash Excluders" in the remaining County CBs located in the City; however, future installations are uncertain due to limited funding availability.

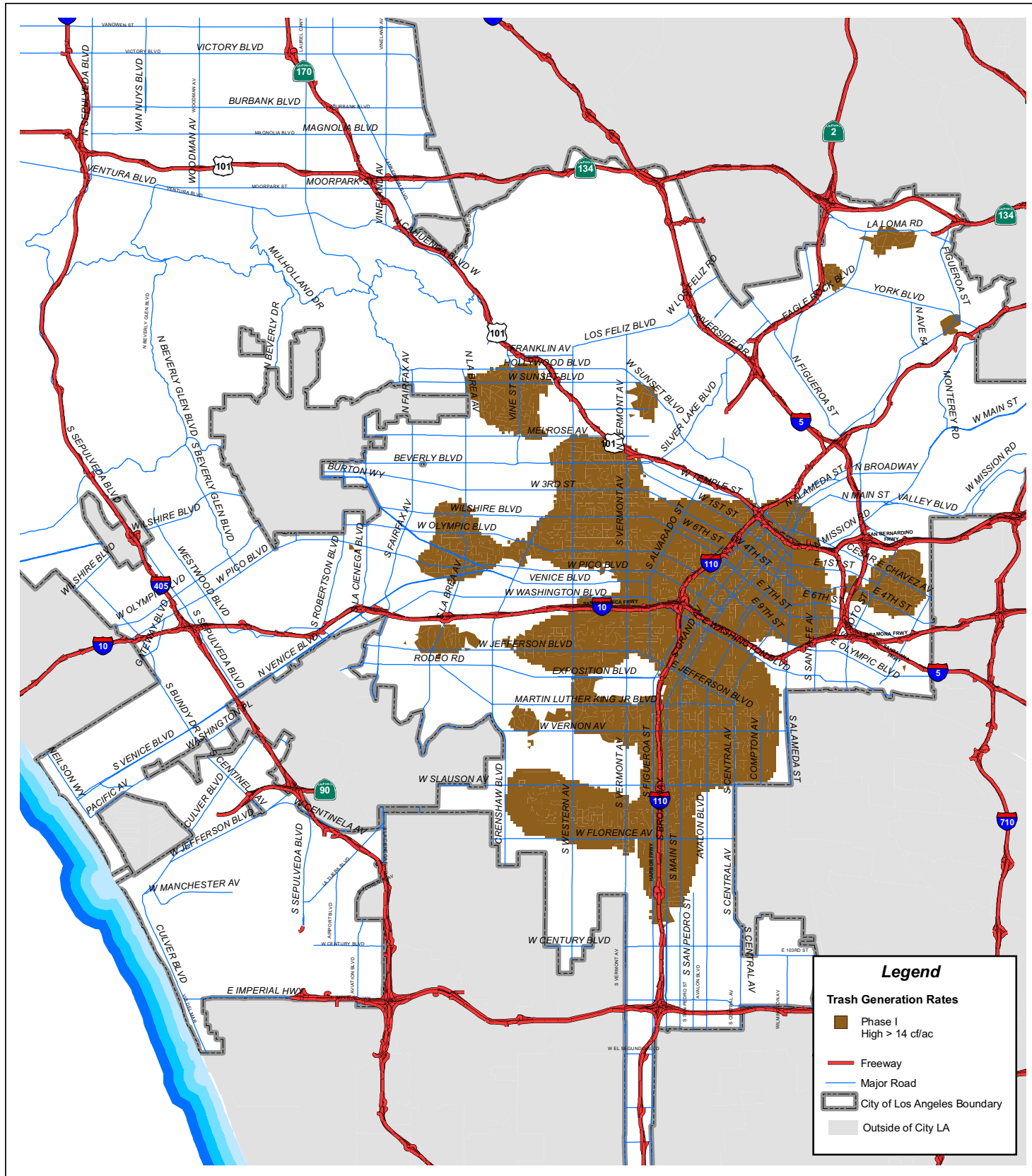


Figure 3. Phase I Implementation Area



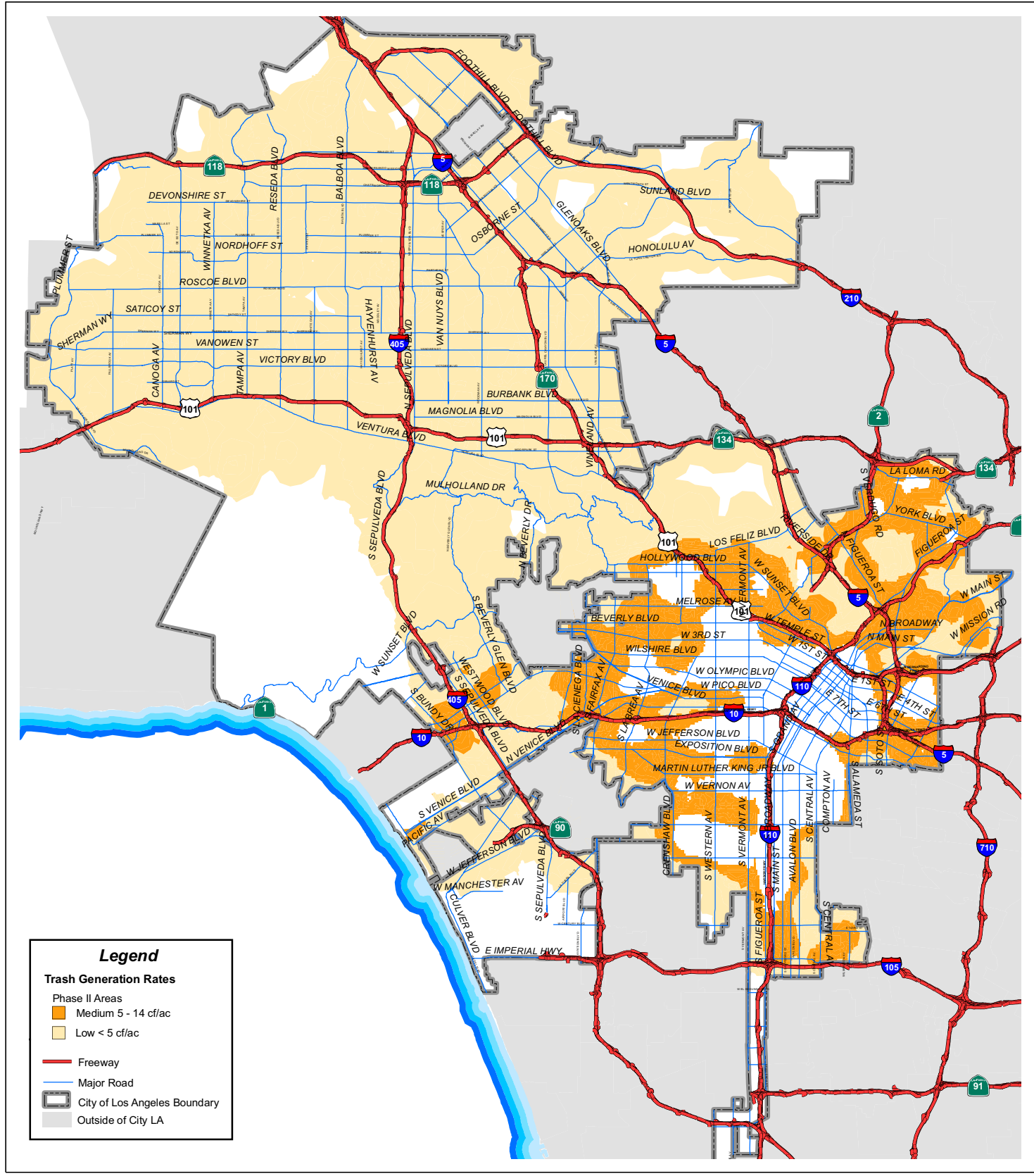


Figure 4. Phase II Implementation Area

Below is a table summarizing the catch basin ownership in the City of Los Angeles for the different trash generation areas in both the LA River and Ballona Creek Watersheds.

Catch Basin Ownership in the City of LA

LA River Watershed

Trash Generation Area	Catch Basin Owner				Total CBs
	City	County	State	Acres	
High	3,600	600	130	8,500	4,330
Medium	4,500	1,500	200	17,800	6,200
Low	10,300	7,600	500	148,000	18,400
Total	18,400	9,700	830	174,300	28,930

Ballona Creek Watershed

Trash Generation Area	Catch Basin Owner				Total CBs
	City	County	State	Acres	
High	6300	800	60	13,900	7,160
Medium	5600	2500	180	20,100	8,280
Low	3600	2300	200	33,700	6,100
Total	15,500	5,600	440	67,700	21,540

* Note that the above values are approximations.

The City of Los Angeles is nearing the completion of Phase I. The City will be ready soon to begin implementing Phase II of this plan. Below is a table summarizing the proposed installation schedule of CB opening covers in the medium and low trash generation areas of the City.

Catch Basin Proposed Retrofit Schedule

Watershed	Opening Covers				
	2007	2008	2009	2010	2011
Los Angeles River	4,900	4,900	4,900	4,900	5,000
Ballona Creek	3,000	3,000	3,000	3,000	2,400

CONCLUSION

There is no one solution for completely controlling trash and debris in storm water and urban runoff. The City of Los Angeles has developed this strategic plan to address the trash problem through both institutional and structural controls. In addition, the City will continue to research new technological advances to provide the best long-term solutions to trash and other pollutants in our waterbodies.

After the first compliance milestone in September 2006, WPD will begin submitting annual Trash TMDL Compliance Reports to the RWQCB. These reports will include the specific locations and quantities of BMPs installed throughout the City with associated drainage areas and BMP effectiveness to determine the City's compliance with the Trash TMDL regulatory milestones.

The City has been researching technologies and conducting pilot studies since the approval of the TMDLs in 2001 in order to determine the best solution to meet the Trash TMDLs. The City is confident that implementation of its strategy and plan will result in compliance with the Trash TMDLs.