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COUNTY OF LOS ANGELES

DEPARTMENT OF PUBLIC WORKS

"To Enrich Lives Through Effective and Caring Service"

MARK PESTRELLA, Director

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June 17, 2019

IN REPLY PLEASE REFER TO FILE: SWP-7
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TO: Each Supervisor

FROM: Mark Pestrella
Director of Public Works

BOARD MOTION OF MARCH 19, 2019, AGENDA ITEM 17
BALLONA CREEK TRASH REDUCTION

On March 19, 2019, the Board instructed the Director of Public Works to report back within 90 days with a summary of steps currently being taken by Ballona Creek Watershed cities to control trash at the source and the status of the current evaluation of trash removal options in Ballona Creek, including the Inner Harbor Water Wheel (Water Wheel) proposal for the Upper Newport Bay.

Background

Ballona Creek is an 8.8-mile-long flood control channel constructed by the Army Corps of Engineers and predominantly maintained by the Los Angeles County Flood Control District. The channel drains the 130-square-mile Ballona Creek Watershed and provides flood risk management for approximately 1.5 million residents of the Cities of Beverly Hills, Culver City, Inglewood, Los Angeles, Santa Monica, West Hollywood, and the unincorporated communities of Ladera Heights and View Park. The City of Los Angeles comprises approximately 80 percent of the watershed by land area. During storm events, Ballona Creek receives an influx of trash from the urban watershed through a network of storm drains. Despite significant reduction in trash over the years due to efforts by upstream municipalities to control trash at the source (summarized below), the Board's own progressive actions, such as banning single use plastic carryout bags, and efforts by the District to implement a "last line of defense" net near the channel outlet, significant amounts of trash continue to reach downstream beaches and the Pacific Ocean.

Trash Control Efforts by Cities

Public Works gathered information from the aforementioned cities and unincorporated communities on their efforts to reduce the amount of trash and debris that is conveyed to the region's waterways. These efforts include retrofitting over 19,000 catch basins with

trash screens, performing scheduled and as-needed catch basin cleanouts, street sweeping, and public outreach efforts. In addition, the District is initiating an anti-littering public outreach campaign in summer 2019 for this watershed that includes use of billboards and postings at bus stops. The anti-littering material will be shared with cities for their use as well. A summary of these trash reduction, maintenance, and outreach efforts are included as Attachment A.

Trash Removal Options in Ballona Creek

Public Works completed an evaluation of trash removal options in Ballona Creek, including the Water Wheel proposal for the Upper Newport Bay. The evaluation identified short- and long-term solutions (summarized below) considering multiple factors, including effectiveness, operability, maintenance, cost, permitting, and hydraulic impact. The full report is included as Attachment B.

Short-term

In the near term, Public Works will install additional trash booms and end-of-pipe nettings in Ballona Creek and tributaries upstream of the current Lincoln Boulevard location. The evaluation found that a combination of booms with traps and end-of-pipe nettings would most effectively improve trash capture performance while also being implementable in a relatively short time. The regulatory permitting process is expected to be relatively straightforward, as installation typically involves only minor modifications to the channel; however, coordination with the Corps will likely be required. Generally, the new devices will be placed adjacent to existing access ramps to facilitate mechanical trash removal. The additional devices will also present opportunities to pilot test various boom and netting designs.

Public Works is pursuing an aggressive schedule to design, procure, and install the new devices for the 2019-20 rain season. The final number and locations of the new devices will be determined during design.

Long-term

Accounting for the proposed Ballona Wetlands Restoration Project, potential swift water rescue trainings and occurrences, and local rowing teams, the most suitable location for a long-term engineered solution is along Ballona Creek at Alla Road. Public Works will pursue the construction of a side channel trash removal structure in Ballona Creek at this location. Trash will be diverted into the side channel and removed by an automated self-cleaning trashrack. This system will use similar principals as the Water Wheel – a boom to divert and an automated conveyor to remove trash – while avoiding the concerns

associated with the Trash Wheel as discussed below. By containing trash in the side channel, the system will minimize trash bypass and avoid hydraulic impacts to the channel. This approach is similar to the Santa Ana Delhi Diversion Project in the City of Santa Ana, which was also constructed to improve water quality and reduce trash entering the ocean.

Public Works will promptly initiate preliminary design and concurrently move forward with environmental documents required for grant eligibility. An update will be included in the October 1, 2019, report to the Board pursuant to the Board motion.

Inner Harbor Water Wheel

Public Works' evaluation included a review of the Water Wheel for use in Ballona Creek. The Water Wheel is a proprietary, award winning trash collection and removal device that utilizes both solar and hydro power. The trash conveyor barge is anchored and floats in place along driven piles. The system uses a trash boom to collect floating trash and debris, which is deposited into a dumpster via a conveyor belt system.

The evaluation concluded that, although it has proven success in Baltimore's Inner Harbor, and is planned as a pilot in the Upper Newport Bay, the Water Wheel would not perform optimally at the Alla Road location for several reasons, including high flow velocity, turbulence, and tide. The evaluation also noted concern with the Water Wheel's potential impact to channel hydraulics. The Water Wheel is best suited to the slower flow conditions of the Inner Harbor and is not designed to handle the unique flow characteristics in Ballona Creek.

If you have any questions, please contact me or your staff may contact Daniel J. Lafferty at (626) 458-4012 or dlaff@pw.lacounty.gov.

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Attach.

cc: Beaches and Harbor
Chief Executive Office
Executive Office

Summary of Ballona Watershed Trash Source Control Efforts

Attachment A

Jurisdiction	Retrofitted CBs	Total CBs*	Catch Basin Cleanout Frequency	Street Sweeping Frequency	Trash Outreach Efforts	Other Outreach Efforts
County UA	402	*467*	All catch basins: *1x during the dry season High Trash Generation Areas: *1x during the dry season *3x during the wet season	All streets are swept weekly	•CLEANLA website (www.cleanla.com) that provides educational materials and opportunities for public participation in stormwater pollution prevention and clean-up, including waste collection events in various communities. Annual Coastal Cleanup Day, in partnership with Heal The Bay.	•Two County-wide student education programs (Environmental Defenders and Generation Earth) for grades K-12. These outreach programs consist of high energy assembly presentations led by actors, in-classroom lesson plans available to teachers, teacher workshops, focused materials, participation at community events, and special projects. •Countywide Used Motor Oil and Oil Filter campaign, including hosting used oil collection and oil filter exchange events promoted via various media outlets; maintaining the Countywide Chinese hotline for Mandarin speaker Do-It-Yourselfers; providing adult schools and community schools information on the proper recycling of used oil and oil filters to new immigrants; and attending community events.
Beverly Hills	1440	*1580*	Annual, As-Needed. (Key drains are cleaned 3-days prior to a rain event)	Residential Areas: 6-Day/Week street sweeping schedule. Commercial areas: 7-days a week. Entire City including alleys: Once a month. Sidewalk Cleaning: Weekly pressure washing in the commercial district. Includes trash receptacle management.	Outreach Program rolled out April 2019. The logo and signs will be posted in Beverly Hills social media pages and on Trash Collection Vehicles. The information will be posted in the City website, local newspaper and public events.	Handouts at Elementary Schools, Earth Day and Public Works Day, Public Works Newsletter – The Backbone.
Culver City	646	*914*	Culver City cleans retrofitted catch basin 1x (September) during dry season and 6x (October – April) during wet season. County FCD cleans its catch basins (retrofitted or not) located in Culver City 1x during the dry season and 3x during wet season.	2x per week: *Washington between Sepulveda and Walnut (west city limits) Washington between Ince and Fairfax (east city limits) *La Cienega between Venice and Blackwelder 5x per week: *Arterial & Downtown Area *Washington – 405 Fwy to Ince *Sepulveda - Venice to Jefferson *Culver – Elenda to Venice *Main Street, Cardiff, Watseka, Delmas Ter, Hughes, and Madison, and Robertson 1x per week: *All remaining arterial and local streets in the City.	N/A	25-30 trash receptacles have been installed along the bike path within Culver City's limits and are being serviced 5x a week.

Summary of Ballona Watershed Trash Source Control Efforts

Attachment A

Jurisdiction	Retrofitted CBs	Total CBs*	Catch Basin Cleanout Frequency	Street Sweeping Frequency	Trash Outreach Efforts	Other Outreach Efforts
Los Angeles	16,279	*23,334*	All the catch basins retrofitted with full capture devices are cleaned at minimum of 3x per year. All other catch basins are cleaned at minimum of 2x per year.	Priority A – Once per Week Priority B – Once Per Month Priority C – Once Per Year	1) YouTube: https://www.youtube.com/user/lastormwaterprogram; promoted via Twitter and Facebook 2) Trash reduction posts/articles/web pages on Twitter, Instagram, Facebook, blog, YouTube, e-newsletter, website (www.LAStormwater.org) 3) School assembly program that focuses on trash and plastic reduction in elementary schools 4) Various public outreach materials (pamphlets, posters, tip cards) 5) Promotion of community/beach cleanups on social media (e.g. La Gran Limpieza on the LA River. City is sharing posts and promoting the event) (From 2005 to June 2018)	Organizes annual "Kids Ocean Day" in partnership with Malibu Foundation for Environmental Education and the California Coastal Commission. About 5,000 LA-area students visit Dockweiler Beach to conduct a beach clean-up and then create an environmental message in the sand. This year's event was on May 23. For more information visit https://www.lastormwater.org/blog/category/events/kids-ocean-day-events/.
Inglewood	264	*494*	Priority A – 2x per rainy season Priority B – 2x per year	Weekly	N/A	N/A
Santa Monica	0	*99*	No CB's from Santa Monica drain to Ballona Creek.	2-3 times per week Residential Areas - once a week Downtown Areas - Daily (Drains to the bay directly)	N/A	Mar Vista Park – Treats runoff from city of LA and City of Santa Monica. A full capture Baffle Box and a StormFilter to remove trash from low flows in Sepulveda Channel.
West Hollywood	110	*610*	County Flood Control District cleans the City's catch basins based on a priority scale (A/B/C), unless otherwise requested by the City. Cleaned twice annually: Once during the dry season, and once right before the wet season.	The entire city is swept on an aggressive tiered schedule based on land use. Residential streets: once a week Commercial streets: range from two to seven days a week.	The city provides and produces stormwater pollution prevention outreach materials primarily through print and social media (brochures, newsletters, bill inserts) and through school outreach campaigns.	•Litter picked up by hand by four separate crews along commercial streets, and 50 feet up each side street, 5x a week. On Santa Monica Blvd and its side streets litter is picked up by hand seven days a week. •The city has installed street side trash receptacles on all commercial streets and at bus stops. This includes 22 Bigbelly solar self compacting street side trash receptacles. •In 2018 the City implemented weekly Enhanced Sidewalk Cleaning Services to remove deep stains, grime, and gum from commercial area sidewalks. The deep-penetrating concrete sealer allows for the capture, filtering, and reuse of water to minimize waste.
Total	19141	27498				

* Figures are based on information in the County's Storm Drain System (SDS) and additional verification is required to ensure full accuracy.

ATTACHMENT B

Los Angeles County Public Works

BALLONA CREEK TRASH CONTAINMENT FEASIBILITY STUDY

June 2019

Public Works
LOS ANGELES COUNTY

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FIGURES

1.0 EXECUTIVE SUMMARY

The existing trash booms does not meet performance expectations preventing debris from entering the Santa Monica Bay, via Ballona Creek. This report, developed by Los Angeles County Public Works (PW), evaluates four different trash containment and collection alternatives to mitigate the amount of trash and debris discharging from Ballona Creek. The main opportunities for improving the existing trash boom are enhancing the ease of maintenance and addressing the lack of redundancy for the larger volumes of trash. Due to its location and limited accessibility, field crews must manually remove trash and debris by hand. The trash booms are designed to break during large storm events to prevent issues with channel hydraulics. However, once broken, this design does not have a secondary measure to stop the trash and debris from being released into the Santa Monica Bay.

Evaluation of the alternatives identified both short- and long-term solutions (See Attachment IV for tentative locations). The short-term solution involves installing multiple trash booms with traps and netting at selected locations upstream of the existing trash boom. The trash booms and netting would be strategically installed adjacent to existing invert access ramps where maintenance personnel and heavy equipment have access to remove debris. Depending on the type of installation, trash boom and end-of-pipe netting typically involves only minor channel modifications and, therefore, avoid a prolonged regulatory process. Creating this redundancy will alleviate the trash load burden on a single boom and help minimize trash bypass, as well as assist in understanding sources of the trash generation.

The long-term solution proposed involves modifying the existing levee to create a diversion and containment system. The trash would be diverted using a trash boom and be fully contained in a side channel. The trash and containment system would be outside of the existing flood conveyance area and therefore have minimal hydraulic impact. Further, the trash and debris removal could be automated through a trash rack or conveyor belt system.

Trash booms and nettings are used around the world to help keep waterways clean from trash and debris. Installing multiple booms and nettings, as well as constructing a channel diversion in Ballona Creek, will provide a viable solution to accompany local source control solutions and ultimately improve the trash deposition issue in Santa Monica Bay.

2.0 BACKGROUND AND STUDY PURPOSE

Since the early 2000's, PW has been operating and maintaining a trash boom (Figure 1) in Ballona Creek between Lincoln Boulevard and Culver Boulevard near County Unincorporated Marina Del Rey (Figure 2). This device is a voluntary measure in helping prevent any floating debris traveling down Ballona Creek to be released into the Pacific Ocean and shorelines.

Since 2016, PW has been notified by members of the public multiple times about the trash and debris deposited near and along the outlet of Ballona Creek. In response, a performance evaluation report on the trash boom was performed to investigate the effectiveness of the existing trash boom in August 2016. The report concluded that the boom was functioning as designed. It also recommended increased inspections, new protocols for operation and maintenance, and procurement of a replacement trash boom. PW has since then adjusted their operation and maintenance procedures and installed a new and improved trash boom.

Figure 1. Ballona Creek Trash Boom (by Kepner Plastics) after a rain event.

In the Fall of 2019, constituents expressed ongoing concerns over the amount of debris ending up on shorelines. As a result, PW evaluated the feasibility of alternative trash containment and collection strategies to identify a recommended approach for improving trash collection in Ballona Creek.

This report provides short- and long-term recommendations for various trash containment and collection devices to be used in the Ballona Creek Watershed. It should be noted that the recommendations within this report are not meant to address or comply with Los Angeles County Municipal Separate Storm Sewer System (MS4) and the associated Trash Total Maximum Daily Load (TMDL) requirements for Ballona Creek.

3.0 WATERSHED CHARACTERISTICS

To determine the proper trash containment and their placement locations, it is important to understand the potential source of the trash. Improperly disposed trash and debris can end up in catch basins and ultimately empty into a waterbody. The trash and debris can also travel through wind or be directly disposed in the waterbody.

The Ballona Creek Watershed (Figure 2) is approximately 81,658 acres and comprised of the entities listed below (Table 1). Litter that is dropped anywhere within this drainage area can travel through the storm drain network and end up in Ballona Creek.

Figure 2, Ballona Creek Watershed and Cities, depicts the Ballona Creek Watershed and jurisdictional limits. The yellow star represents the outlet of the watershed.

Agency	Watershed Area (ac)	Percent Area
Santa Monica	252	0.3%
West Hollywood	1,213	1.5%
Inglewood	1,937	2.4%
Culver City	3,244	4.0%
Beverly Hills	3,657	4.5%
Unincorporated (LA County)	3,919	4.8%
Los Angeles	67,436	82.6%
Total	81,658	100%

Table 1. Ballona Creek Watershed and Jurisdictions. The table displays the percent area of each city within the Ballona Creek Watershed

4.0 TRASH CONTAINMENT AND COLLECTION ALTERNATIVES

There are various approaches to reduce trash and debris in Ballona Creek and Santa Monica Bay. Due to federal clean water regulations, agencies have already adopted or are currently implementing some of the trash controlling measures listed below:

- Installing and maintaining trash capturing device(s)
- Employing source control measures (e.g. plastic straw and bag ban)
- Implementing a site or area-specific trash control (e.g. catch basin screen retrofit, street sweeping, parking lot and/or channel sweeping, catch basin clean outs, more trash can receptacles)
- Education, outreach and trash volunteer programs
- Increase enforcement and/or penalties on littering.

In addition to the methods listed above, Los Angeles County Beaches and Harbors also operates and maintains several trash skimmer devices and multiple trash skimmer boats in and around the marina. The trash skimmer devices are trash bins with pumps that sit inside the marina collecting floating debris. The trash skimmer boats are manually operated boats that drive around the marina and shorelines collecting debris.

This report will focus on the recommendations for the installation and maintenance of trash capturing devices with Ballona Creek. Specifically, it will focus on end-of-pipe or end-of-line trash and debris abatement methods. End-of-pipe or end-of-system is a device that is located at the most downstream point of a pipe or the end of the watershed, respectively.

4.1 Constraints

Listed below are some of the design constraints and existing conditions that PW has taken into consideration when deciding on the trash reducing measures and their perspective location(s).

- Ballona Wetlands Restoration Project – There are plans to restore the channel from Lincoln Boulevard to the outlet. The trash alternatives would need to be located upstream or downstream of the area to avoid conflict with this project.
- Swift Water Rescue – The trash device would need the ability to get severed or removed quickly for first responders in emergency situations.
- Collegiate Rowing – Ballona Creek from Culver Boulevard to Ballona Creek Bridge is used by University of California, Los Angeles and Loyola Marymount University rowing teams for training.
- Jurisdiction – United States Army Corps of Engineers is responsible for some reaches of Ballona Creek

Placing a trash capturing device at the furthest downstream point in a watershed is the most cost effective and efficient way to capture trash and debris. Since the downstream portion of Ballona Creek Channel is being utilized for various other community activities and is home to various other community activities and has a potential restoration project in the future, the trash capturing device location should be placed upstream of Lincoln Boulevard. Reference Attachment I for potential locations for each alternative.

4.2 Alternatives

After analyzing the various systems, meetings with maintenance personnel, conducting research, discussing with other agencies and vendors, and combining existing constraints, the following describes various trash containment and collection alternatives proposed to alleviate the trash burden in Ballona Creek.

4.2.1 Clearwater Mills – Mr. Trash Wheel

The water wheel trash interceptor, or Mr. Trash Wheel (Figure 3) by Clear Water Mills, is a floating trash collection and removal device located in the Baltimore Inner Harbor. It is a self-sustainable system that utilizes both solar panels and a water wheel for power. The trash conveyor barge is anchored and floats in place with driven piles. Utilizing the water current and trash boom, floating debris and trash are diverted onto a conveyor belt system that deposits the refuse into a dumpster. Depending on the overall design, the dumpster can be removed by a railing system or by boat.

Figure 3. Mr. Trash Wheel. This picture shows Mr. Trash Wheel in operation in the Baltimore Inner Harbor.

Mr. Trash Wheel has proven to be successful at removing trash where it was first adopted in Baltimore's Inner Harbor. Baltimore currently has a total of three water wheels in operation and is working on the fourth. The City of Newport Beach is also proposing a Water Wheel in San Diego Creek to alleviate trash in their waterways (Figure 4).

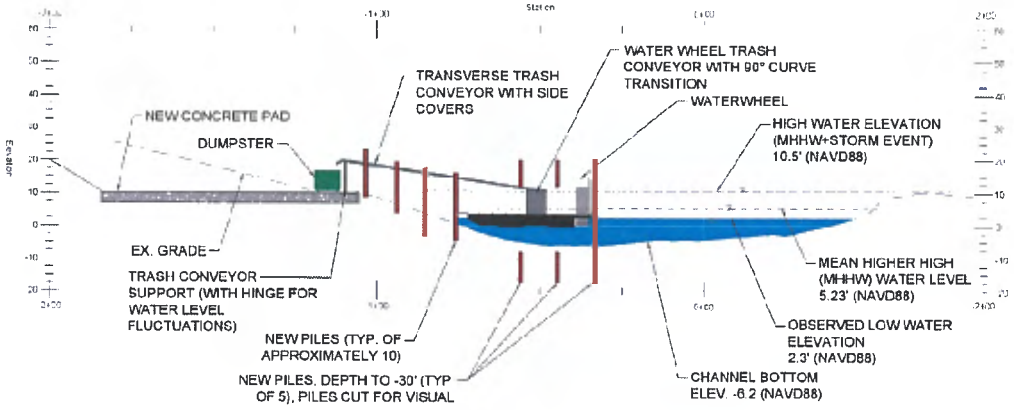

Figure 4. City of Newport Beach Conceptual Water Wheel Section. The cross-section is a conceptual Water Wheel design proposed by the City of Newport Beach

4.2.2 Channel Diversion with Automatic Trash Rack

The Channel Diversion alternative involves reconstructing the levee to create a side channel to contain the trash and debris. The trash can be diverted into the side channel using a trash boom and be removed by a self-cleaning trash rack or conveyor belt system (Figure 5). The diversion system can securely contain trash during storm events and have minimal hydraulic impact to the existing flood control channel since the side channel, the collection system and trash are away from the main flood control channel.

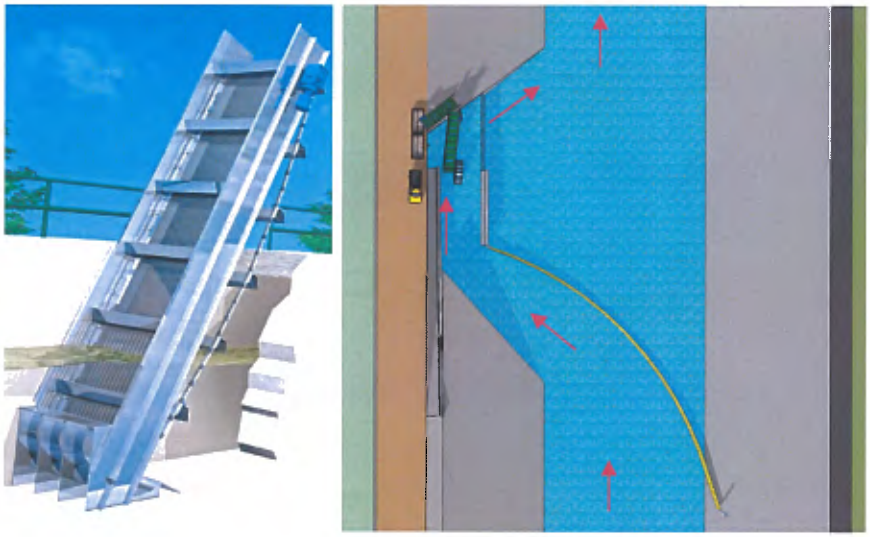

Figure 5.
Conceptual Diversion with Automatic Trash Rack. Trash is can securely contained in the side channel and removed with automatic conveyor belt system. The red arrows show the water and trash path of travel

The City of Santa Ana has a similar diversion project installed in Santa Ana-Delhi flood control channel (Figure 6). This project aims to reduce trash amounts in the bay and channel. This diversion system utilizes nets and a coarse screen bar to filter out trash and debris

Figure 6.
Santa Ana-Delhi (SAD) Diversion Project. This is the SAD Diversion Project in construction looking upstream. The blue arrows show the water and trash path of travel.

4.2.3 End-of-Pipe/End-of-System Netting

End-of-pipe or End-of-system nettings are prefabricated systems that utilize nets to capture trash. As the names suggest, they are installed at the end of a pipe outlet structure or can be placed inside a channel as seen in the Figure 7 and Figure 8 below. As trash laden stormwater flows down a pipe or channel, the netting captures the debris and lets the stormwater bypass over or through the nets. Once full, the nets are removed and disposed of by heavy equipment. There are also options to have reusable nets.

Figure 7. Wilmington Drain Trash Netting System. The picture shows the StormTrap TrashTrap looking downstream in Wilmington Drain (left). These are 5mm drain nets or socks inside the precast chamber (right).

Figure 8. Stormwater Systems – StormX Netting Trash Trap. The picture displays a netting system inside a channel downstream of an outlet

Attachment I shows the approximate locations of where nettings can be installed.

4.2.4 Multiple Trash Booms

There are numerous vendors that manufacture trash booms like the existing one used in Ballona Creek in Figure 1. Trash booms are typically comprised of a buoyancy chamber and netting system. The buoyancy chamber is usually a foam material or polyethylene pipe and the netting can take form of a metal grating or fabric with a chain (See Figure 9).

As stormwater flows through a channel, the system is designed to float on the surface of the water and traps floating debris and trash. The trash collected behind the boom is typically removed by heavy equipment or manually by hand. Some boom systems have attachments that allow the trash to be captured in a trap as shown in Figure 10 below to reduce trash bypass.

Figure 9. Bandalong Boom by Storm Water Systems. Boom comprised of an HDPE Pipe with metal mesh skirt.

Figure 10. Bandalong Boom System and Litter Trap by Storm Water Systems. This picture shows a floating boom litter trap.

Utilizing multiple trash booms can help reduce the burden on the existing single trash boom, provide redundancy in the trash capturing system, and offer the opportunity to test the effectiveness of different trash boom vendors.

Access is an important factor to consider when selecting any trash capturing device. Field personnel and equipment need the ability to reach the trash boom for maintenance purposes. Attachment IV shows the approximate locations to install trash booms and/or traps, which are all adjacent to existing channel invert access ramps.

Installing multiple booms in series may also provide more information on the source of trash generation. Once installed, volumes of trash could be analyzed at each location to potentially refine the understanding of which tributaries and/or sub watershed(s) are generating the pollution. This would inform further efforts for trash controlling measures to be implemented at the source(s).

5.0 EVALUATION CRITERIA

This study used the following five criteria to evaluate the devices to determine the recommendations: effectiveness, operability/safety, cost, regulatory feasibility, and hydraulic impact.

1. Effectiveness
    - The relative extent a device can capture, contain and remove trash and debris.
2. Operability/Safety
    - The ease of access for operation and maintenance. The ability to remove trash and debris safely and efficiently.
3. Cost
    - The estimated total soft and hard costs associated with the implementation of a device.
    - The estimated annual operation and maintenance cost associated with operating and maintaining a device.
4. Regulatory Feasibility
    - The complexity and timeframe associated with acquiring regulatory permits.
5. Hydraulic Impact
    - The level at which the device potentially impacts culvert and/or channel hydraulics

Each device was compared and assigned a low, moderate or high rating in each category. A low rating (red) indicates poor performance and/or less desirable outcome. A moderate rating (yellow) indicates a reasonable performance and a high rating (green) indicates a great performance and/or desirable anticipated outcome.

6.0 COMPARISON

See Attachment II

7.0 CONCLUSION AND RECOMMENDATIONS

Although Mr. Trash Wheel has proven itself in Baltimore's Inner Harbor, the installation of one in Ballona Creek at the necessary location (near Alla Road) would not achieve the same benefit. The capture, containment, and removal effectiveness of Mr. Trash Wheel would be reduced due to high turbulence and velocities experienced in this flood control channel, as accumulated trash could bypass over and/or under the trash boom. Also, the collected trash captured and contained behind the boom would be released into the ocean in the event the trash boom broke or failed. Its ability to operate and remove trash is limited to only when there is high tide or the tail-end of a storm event, which also leaves the potential for the accumulated trash to bypass or be released.

Trash booms and nettings are effective, relatively low cost, and have minimal hydraulic impact. Also, due to their simple design and proposed locations, the operation and maintenance can be completed efficiently. The retrofit and installation of these devices should require lesser regulatory permits and environmental review than the channel diversion, making it a viable candidate for a short-term solution. The installation of these trash reducing measures will require dedicated maintenance personnel to ensure the trash capture and containment effectiveness. It is anticipated that PW would need at least one new crew in the short term, but details will be further evaluated during design.

A channel diversion with an automatic trash rack is recommended for the long-term trash reduction solution in Ballona Creek. A side channel ensures trash is securely stockpiled and helps prevent bypass during larger storm events. The trash rack can automate the trash and debris removal process, therefore requiring less manual labor and maintenance personnel.

Based on this feasibility study, PW recommends installing multiple trash booms with trash traps and end-of-pipe netting in the short-term and a channel diversion in the long- term (See Attachment IV for locations). See Table 2 below for estimated construction and annual operation and maintenance costs. The effectiveness of the short-term efforts and other agencies' efforts will continue to be evaluated as we pursue a long-term solution.

Proposed Alternatives	Estimated Construction Cost	Estimated Annual O&M
End-of-Pipe Netting (3 Locations)	$800K	$290K
Trash Boom with Trap (4 Locations)	$1.8M	
Channel Diversion with Automatic Trash Rack	$5.0M	$90K

Table 2. Proposed Trash Containment and Collection Alternatives Costs. Displays the estimate construction and annual operation and maintenance costs for the proposed alternatives.

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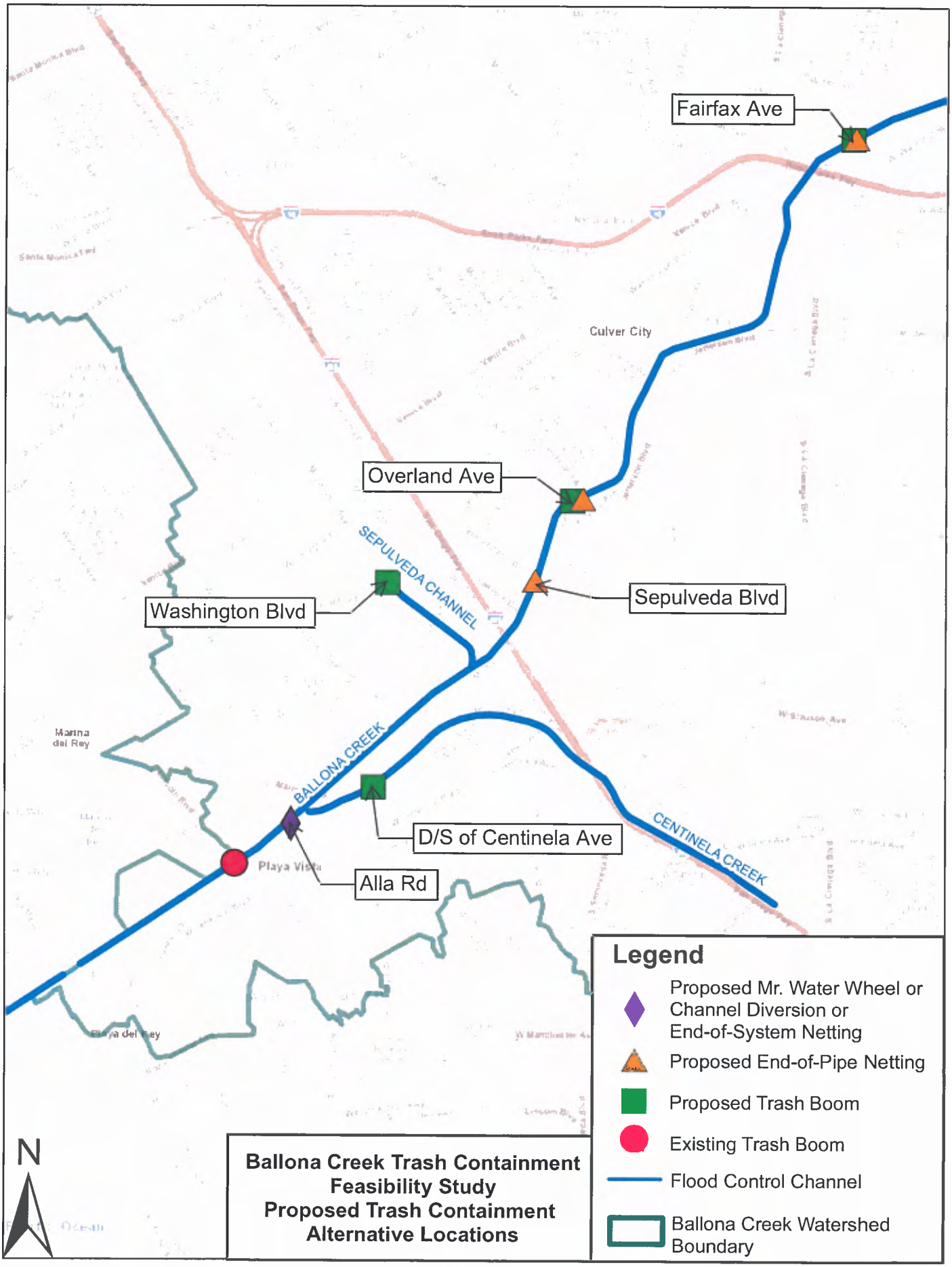
Attach.

cc: Design (Gindi, Atashzay, Lui), Stormwater Quality (Lombos, Hamamoto), Stormwater Planning (Wu, Nguyen), Stormwater Maintenance (Lacayo, Cruz)

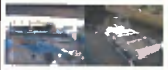
ATTACHMENT I



Ballona Creek Trash Containment Feasibility Study
Proposed Trash Containment Alternative Locations

ATTACHMENT II

Ballona Creek Trash Containment Feasibility - Alternatives and Evaluation Comparison

ALTERNATIVES	PICTURE/ SCHEMATIC	CAPTURING EFFECTIVENESS	CONTAINMENT EFFECTIVENESS	REMOVAL EFFECTIVENESS	OPERABILITY/ SAFETY	COST	ANNUAL O&M COST	REGULATORY FEASIBILITY	HYDRAULIC IMPACT
		EVALUATION CRITERIA							
CLEARWATER MILLS - MR. TRASH WHEEL (AT ALLA RD)		Moderate - The main capturing system of the device is the trash boom, and would capture mainly floating debris	Moderate - Floating trash and debris will only stay within boom area during small storm events	Moderate- Water Wheel at Alla Rd can operate to remove trash and debris only when itself is floating (high tide and tail end of a storm) and cannot operate during a storm event.	Moderate - Automated conveyor belt and trash bin system, but can only operate when there it is floating (high tide or tail end of a storm event)	- M	$90K	Low - Possible permits, approvals and environmental review from, but not limited to: U.S. Army Corps of Engineers - 404, 408 State Office of Historic Preservation - 106 California Coastal Commission/Regional Planning - Coastal Development Permit California Department of Fish and Wildlife - Streambed Alteration Permit Los Angeles Regional Water Quality Control Board - 401 City of Los Angeles - Building and Grading Permit Los Angeles County Flood Control District	Moderate - Given the high velocity , the vessel, driven piles, and boom with trash will have an affect on the channel hydraulics
CHANNEL DIVERSION WITH AUTOMATIC TRASH RACK		Moderate - The main capturing system of the device is the trash boom, and would capture mainly floating debris	High - Trash is contained within diversion area and boom area. This allows the trash and debris to be contain help prevent bypass	High - Trash can be removed during anytime. Automatic self cleaning rack can remove trash and debris	High- Automated conveyor belt and trash bin system	Low - $5.0M	$90K	Low - Possible permits, approvals and environmental review from, but not limited to: U.S. Army Corps of Engineers - 404, 408 State Office of Historic Preservation - 106 California Coastal Commission/Regional Planning - Coastal Development Permit California Department of Fish and Wildlife - Streambed Alteration Permit Los Angeles Regional Water Quality Control Board - 401 City of Los Angeles - Building and Grading Permit Los Angeles County Flood Control District	High- The collection system and debris are outside of the existing flood conveyance
MULTIPLE TRASH BOOMS/TRAP		Moderate - The main capturing system of the device is the trash boom, and would capture mainly floating debris	High - Floating trash and debris will only stay within boom area during small storm events. Having multiple booms and floating traps will help provide redundancy and reduce bypass. Different types of booms to be utilized to study effectiveness	Low - Depending on the location access, debris would need to be picked up manually or via heavy equipment	Moderate - Heavy equipment crane/gradall will assist with trash removal	Moderate- $50K-$1.8M	$290K	Low - Possible permits, approvals and environmental review from, but not limited to: U.S. Army Corps of Engineers - 404, 408 Los Angeles County Flood Control District Los Angeles Regional Water Quality Control Board - 401	Moderate - Depending on the design, the boom and trap could impact channel hydraulics
END OF PIPE/END OF SYSTEM NETTING		High - Depending on how many devices are installed, end of pipe netting have a full capture ability	High - Trash contained in net and/or cage	Low - Device does not remove trash. Requires crane and access to remove	Moderate - Only need to remove net and replace with crane.	Moderate - $60K-$5.0M		Low - Depending on where the device is situated, possible permits, approvals and environmental review from, but not limited to: U.S. Army Corps of Engineers - 404, 408 State Office of Historic Preservation - 106 California Coastal Commission/Regional Planning - Coastal Development Permit California Department of Fish and Wildlife - Streambed Alteration Permit Los Angeles Regional Water Quality Control Board - 401 City of Los Angeles - Building and Grading Permit Los Angeles County Flood Control District	Moderate - Depending on the design, the netting and structure could impact channel hydraulics

COUNTY OF LOS ANGELES

DEPARTMENT OF PUBLIC WORKS

"To Enrich Lives Through Effective and Caring Service"

900 SOUTH FREMONT AVENUE
ALHAMBRA, CALIFORNIA 91803-1331
Telephone: (626) 458-5100
http://dpw.lacounty.gov

MARK PESTRELLA, Director

ADDRESS ALL CORRESPONDENCE TO:
P.O. BOX 1460
ALHAMBRA, CALIFORNIA 91802-1460

October 1, 2019

IN REPLY PLEASE REFER TO FILE: SWQ-3
10072-2-1

TO: Each Supervisor

FROM: Mark Pestrella
Director of Public Works

BOARD MOTION OF MARCH 19, 2019, AGENDA ITEM 17
BALLONA CREEK TRASH REDUCTION

On March 19, 2019, the Board instructed the Director of Public Works to report back by October 1, 2019, with a multi-year, multi-agency plan to reduce trash and debris littering local beaches near the Ballona Creek outlet, including improved coordination among cities in the watershed to reduce trash entering Ballona Creek, solutions for in-channel trash control, a strategy to promote anti-littering behavior, and an assessment of grants and other funding opportunities.

Background

Ballona Creek is an 8.8-mile-long flood control channel constructed by the United States Army Corps of Engineers and predominantly maintained by the Los Angeles County Flood Control District. The channel drains the 130-square-mile Ballona Creek Watershed and provides flood risk management for approximately 1.5 million residents of the Cities of Beverly Hills, Culver City, Inglewood, Los Angeles, Santa Monica, West Hollywood, and the unincorporated communities of Ladera Heights and View Park. The City of Los Angeles comprises approximately 80 percent of the watershed by land area. During storm events, Ballona Creek receives an influx of trash from the urban watershed through a network of storm drains. Despite significant reduction in trash over the years due to efforts by upstream municipalities to control trash at the source, the Board's own progressive actions, such as banning single use plastic carryout bags, and efforts by the District to implement a "last line of defense" near the channel outlet, considerable amounts of trash continue to reach downstream beaches and the Pacific Ocean.

Trash Reduction Efforts by Cities

Following the Board's action, Public Works met with each city in the watershed to encourage them to implement additional measures to reduce the flow of trash to Ballona Creek. As a result, the cities stepped up their trash reduction efforts. For example,

several cities are providing improved and more frequent trash collection and litter cleanup services, replacing worn out catch basin trash screens, installing additional trash receptacles in popular pedestrian pathways, and expanding anti-littering public education campaigns. A summary of these efforts is included in Attachment A. In addition, local return revenue from the Safe, Clean Water Program could be used for these and other efforts to improve water quality within cities.

Public Works will continue to work with cities in the Ballona Creek Watershed to ensure that trash reduction efforts within their respective jurisdictions are continually implemented and re-evaluated regularly to ensure their effectiveness.

Solutions for In-Channel Trash Control

Short-term

Public Works continues to enhance trash collection along Ballona Creek. For example, Public Works made modifications to the existing trash net system located downstream of Lincoln Boulevard to improve performance, including added buoyancy to better handle high turbulence conditions. Additional design modifications are under consideration to further improve performance. In addition, Public Works has increased the frequency of trash removal of residual trash along the banks of the Ballona Creek year round. For example, during the storm season (October 15 to April 15), trash along the banks is removed twice a week. Moving forward, trash will be collected daily. These heightened efforts will continue until such time that other short- and long-term trash control efforts effectively reduce trash in Ballona Creek.

To alleviate the trash load on the existing trash net system downstream of Lincoln Boulevard, Public Works plans to pilot two additional trash net systems at the following locations:

1) Centinela Creek, approximately 150 feet downstream of Centinela Avenue
2) Ballona Creek at Purdue Avenue, approximately 200 feet upstream of the 405 Freeway

For residual trash not caught by the existing trash net system, the Department of Beaches and Harbors operates a skimmer boat and two fixed trash skimmers, and conducts daily litter removal along the beaches to prevent trash from accumulating at nearby beaches. To bolster these efforts, the Department of Beaches and Harbors is currently seeking grant funding to acquire additional trash skimmers.

Long-term

As mentioned in my June 17, 2019, report back to the Board, Public Works has initiated the preliminary design of a long-term engineered solution for Ballona Creek at Alla Road (see Attachment B for proposed location). This solution includes the construction of a side channel trash removal structure with an automatic trash removal system. Design is anticipated to be completed by the end of 2020 with preparation of the California Environmental Quality Act document occurring thereafter. In March 2019 Public Works submitted a $2 million grant application to the Ocean Protection Council for this project. However, the project was not selected for award. Public Works is committed to continuing to pursue this project despite not receiving the grant. Revenues from the Safe, Clean Water Program will be explored for use on this project.

To complement this effort, the City of Los Angeles, in partnership with municipalities within the watershed, plans to install three low-flow diversion projects in Ballona Creek, Centinela Creek, and Sepulveda Channel. During dry weather, the projects will divert urban runoff from approximately 90 percent of the watershed to the sewer system for treatment. Pollutants, such as bacteria, toxics, and smaller pieces of trash, will be removed from this runoff. The project proponents are currently obtaining necessary permits and plan to complete construction in 2024. The locations of each facility are included in Attachment C.

Strategy to Promote Anti-littering Behavior

Public Works recently implemented a regional anti-littering public education campaign with the goal of promoting behavioral changes toward proper handling of trash. Educational materials were produced in English and Spanish to maximize public outreach. The initial phase of the campaign focused on the Ballona Creek Watershed and consists of the following programs:

1) Billboard ads were placed on major roads at six locations for 1 month and estimated to have garnered over 3 million impressions;
2) Bus shelter ads were placed at 10 locations for 2 months and estimated to have had over 7 million impressions;
3) Ads were placed in the Los Angeles Daily News, Los Angeles Times, and El Aviso;
4) An educational brochure was developed and distributed at various retail stores (hardware, pet, and grocery), community events, and public libraries throughout the watershed; and
5) Permanent anti-littering signs were placed at three locations along the Ballona Creek bike path.

The campaign materials were shared with cities, some of which are in the process of adapting and utilizing these materials for use within their cities. The outreach campaign will continue and expand to other watersheds in the County. Additional details are included in Attachment D.

Assessment of Grants and Partnership Opportunities

Public Works compiled and prioritized potential grant opportunities available to fund measures to reduce trash in Ballona Creek. The result of the assessment is included as Attachment E. Public Works is also continually exploring partnership opportunities to identify collaborative and mutually beneficial solutions to address trash.

If you have any questions, please contact me or your staff may contact Daniel J. Lafferty at (626) 458-4012 or dlaff@pw.lacounty.gov.

AD:dw
P:\swqpub\Sec\2019\Board Rep\Ballona\Ballona_Trash_Motion_Report_Oct1.docx

Attach.

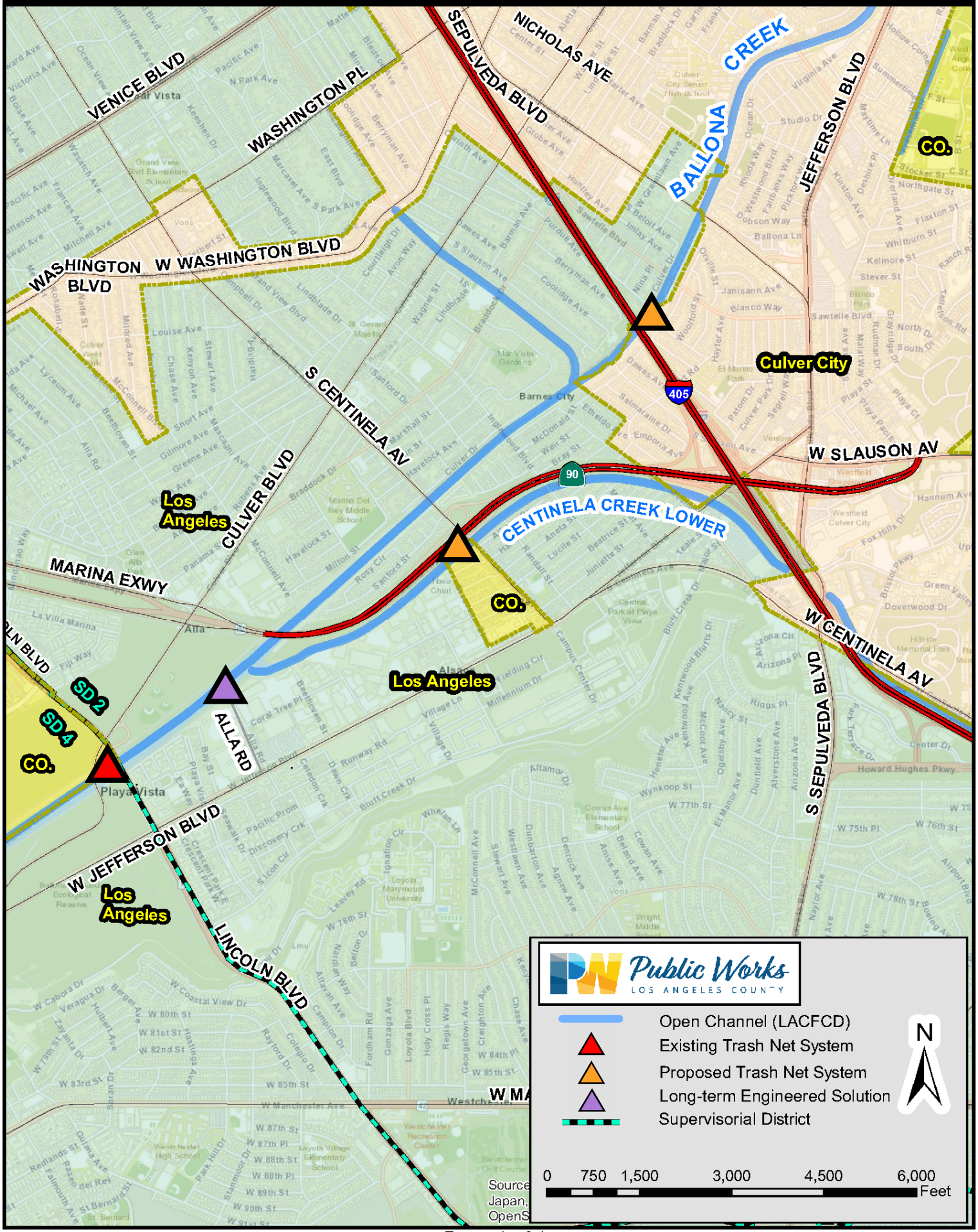
cc: Department of Beaches and Harbors (Gary Jones)
Chief Executive Office (Chia-Ann Yen)
County Counsel (Mark Yanai)
Executive Office

Attachment A
Additional Short-Term Trash Reduction Efforts by Cities in the Ballona Creek Watershed

Jurisdiction	Additional Anti-Trash Measures
Beverly Hills	The City is moving forward with an Anti-Litter Public Education Campaign. Selected campaign messages will be used on trash trucks and trash bins in addition to social media, department newsletter (The Back Bone) and the local newspaper. The City is also enhancing their maintenance program (i.e. trash, sidewalk, weed abatement, stains and sticky items) on the business area sidewalks by adjusting shifts and adding more trash and litter services.
Culver City	The City recently conducted a study, which determined that additional trash containers were needed to prevent trash from entering Ballona Creek. As a result the city is installing additional trash containers along a popular pedestrian pathway. The City is also evaluating whether to amend their polystyrene ordinance to include bans on additional materials. City staff will be meeting with businesses and various associations to determine if an amendment is feasible and/or necessary. The City will also be painting murals at the bike path entries along Ballona Creek to raise public awareness regarding anti-littering behaviors. The City will utilize its Municipal Funds from the Safe Clean Water Program to add 143 more city catch basin screens/intercepts and perhaps 243 more catch basin screen/intercepts on Flood Control District catch basins.
Los Angeles	The City plans to: •Replace old and worn out catch basin inserts and screens. •Improve trash collection and cleanups related illegal dumping activities. •Consider utilizing public outreach material prepared by Public Works for the City's use. •Evaluate other trash reduction opportunities that may arise.
Inglewood	No new information is available at this time.
Santa Monica	The City is not planning to implement additional measures at this time since treatment at Mar Vista Park treats all dry weather runoff and small rain event runoff from Santa Monica to Ballona Creek.
Unincorporated Area	Public Works has been and will continue to implement enhancements to it's trash control program as specified in the report.
West Hollywood	The City will be installing 10 additional catch basin filters in the near future.

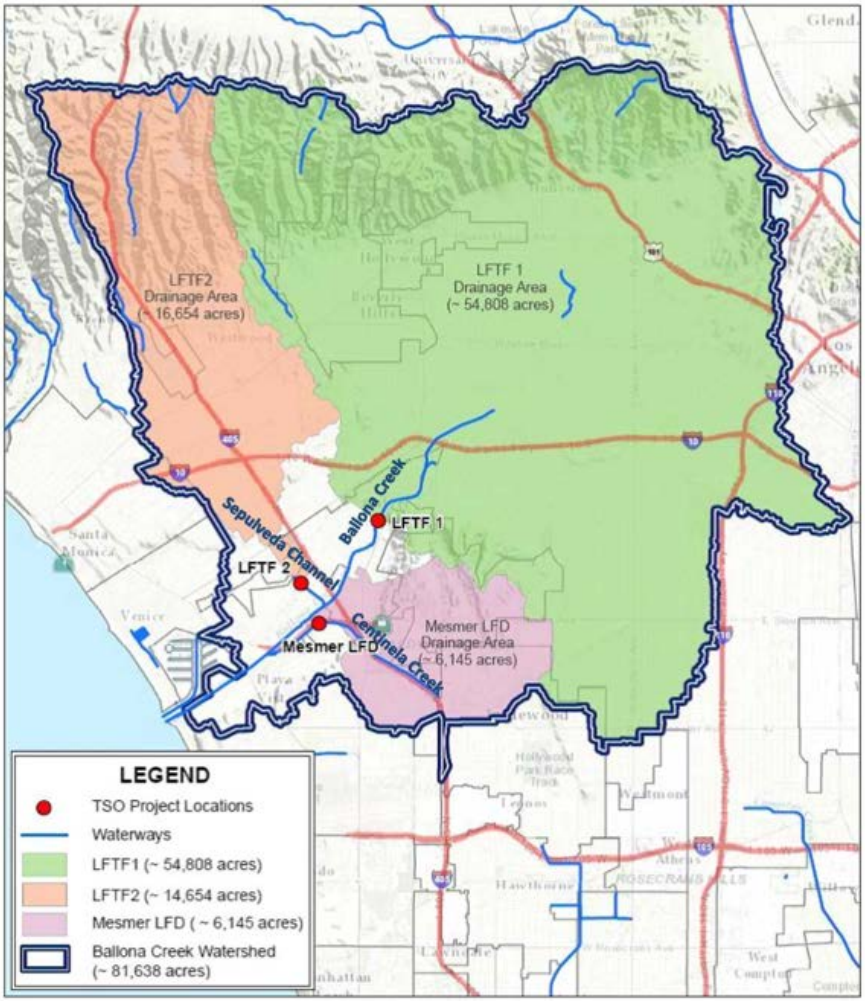
Attachment B

Proposed Locations of New Trash Reduction Systems



Attachment C

PROPOSED BALLONA CREEK LOW-FLOW DIVERSION PROJECTS



Three proposed dry-weather low-flow diversion projects will divert urban runoff from approximately 90% of the watershed to the sewer system for treatment. Pollutants such as bacteria, toxics, and smaller pieces of trash will be removed from this runoff. The estimated collective cost is $32.5 million, which will be shared among the cities based on proportional drainage area.

Low-Flow Treatment Facility #1 - Project proposes to divert, treat, and/or return non-storm water flows in Ballona Creek (Reach 2).

Low-Flow Treatment Facility #2 - Project proposes to divert, treat, and return non-storm water flows in Sepulveda Channel.

Mesmer Low-Flow Diversion – Project proposes to divert non-stormwater water flows in Centinela Channel to the sanitary sewer.


Inflow
Saw Cut Diversion
Ballona Creek
Treatment System
To Sewer
Treated Outflow
LOW-FLOW TREATMENT FACILITY #1

LOW-FLOW TREATMENT FACILITY #2

MESMER LOW-FLOW DIVERSION

Attachment D

ANTI-LITTERING PUBLIC OUTREACH CAMPAIGN IN BALLONA CREEK WATERSHED

Introduction

Public Works recently implemented a multi-media anti-littering outreach campaign throughout the Ballona Creek watershed. The campaign consisted of six programs, including billboard ads, bus stop ads, digital ads, print ads, bike trail signs, and educational brochures. Both English and Spanish languages were used to maximize the public outreach. A brief description of each campaign program is provided below.

Billboard Ads

Billboard ads were placed on major roads at six locations within the Ballona Creek watershed. The billboard ads (see below) garnered approximately 3.2 million impressions.

Run Dates	Location of Billboard	Impressions
6/4 - 6/30	Wilshire Blvd. at S. Wilton Pl.	579,169
6/4 - 6/30	Olympic Blvd., West of Freeway 110	516,273
6/4 - 6/30	Crenshaw Blvd., North of Homeland Dr.	817,503
6/4 - 6/30	W. Adams Blvd., West of Crenshaw Blvd.	504,705
6/4 - 6/30	Washington Blvd., West of Hobart Blvd.	331,667
6/4 - 6/30	Olympic Blvd., East of Freeway 405	449,720
	Total	**3,199,037**

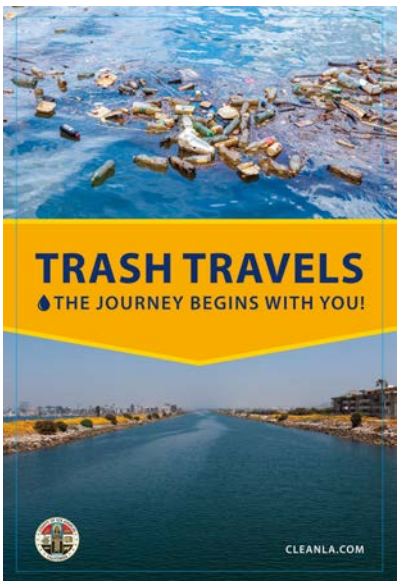
Billboard Ads

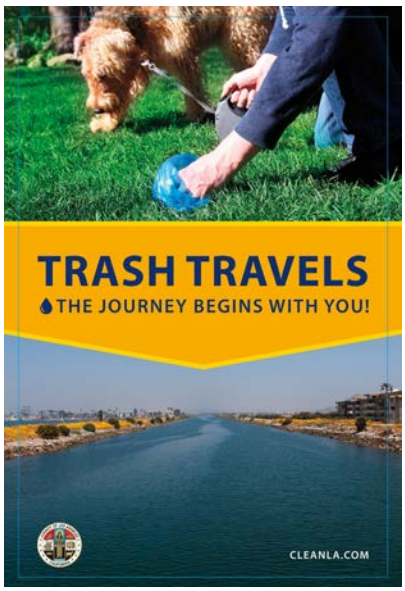
Bus Stop Ads

Bus stop ads were placed on major roads at 10 locations within the Ballona Creek watershed. The ads (see below) were developed both in English and Spanish languages and garnered approximately 7.2 million impressions.

Run Date	Location of Bus Stop	Impressions
6/7 – 7/28	Slauson Ave., West of Shenandoah Ave.	1,239,468
6/7 – 7/28	Overhill Dr., South of La Brea Ave.	331,890
6/24 – 8/18	Wilshire Blvd. at Westwood Blvd.	831,444
6/24 – 8/18	Pico Blvd. at Sawtelle Blvd.	478,584
6/24 – 8/18	Venice Blvd. at South Redondo Blvd.	719,776
6/24 – 8/18	Washington Blvd. at Vermont Ave.	636,232
6/24 – 8/18	Melrose Ave. at Van Ness Ave.	556,856
6/24 – 8/18	Martin Luther King Jr. Blvd. at Figueroa Street	893,608
6/24 – 8/18	Venice Blvd. at National Blvd.	958,560
6/24 – 8/18	Manchester Ave. at Lincoln Blvd.	563,152
	Total	**7,209,570**

Bus Stop Ads

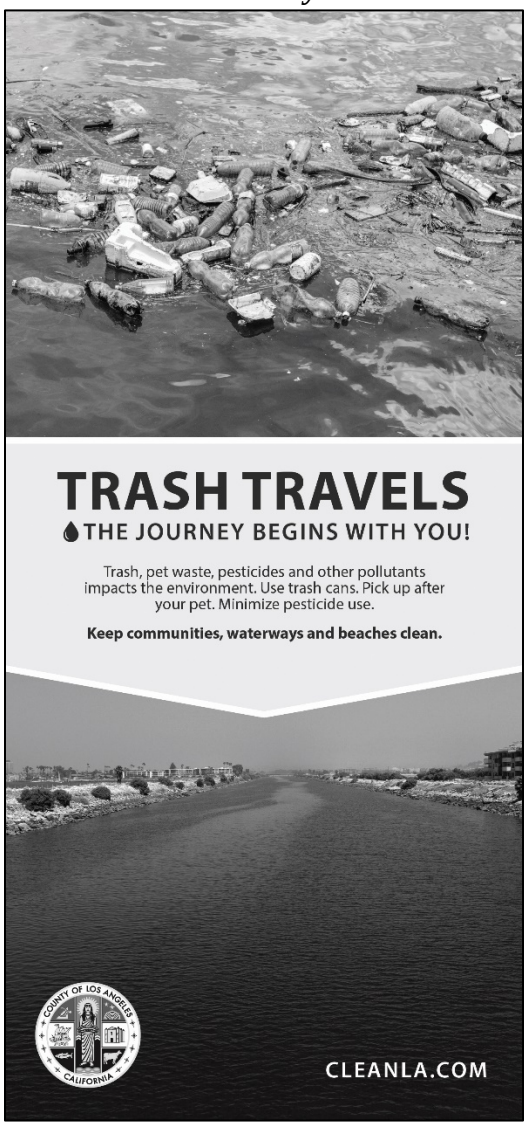




Print Ads

Print ads were placed in the Los Angeles Daily News and El Aviso (Spanish) newspapers. The ads (see below) garnered approximately 2 million impressions.

Ads in LA Daily News



Date	Publication	Circulation
6/10	El Aviso	325,000
6/16	LA Daily News	653,368
7/14	LA Daily News	653,368
7/15	El Aviso	325,000
	Total	**1,956,736**

Ads in El Aviso (Spanish)

Digital Ads

Digital newspaper ads were placed in the Los Angeles Times and Los Angeles Daily News. These ads (see below) garnered nearly 1 million impressions.

Run Date	Publication	Impressions
6/10 – 6/23	LA Times	375,069
6/10 – 6/23	LA Daily News	169,611
7/8 – 7/21	LA Times	343,343
7/8 – 7/21	LA Daily News	32,102
	Total	**920,125**

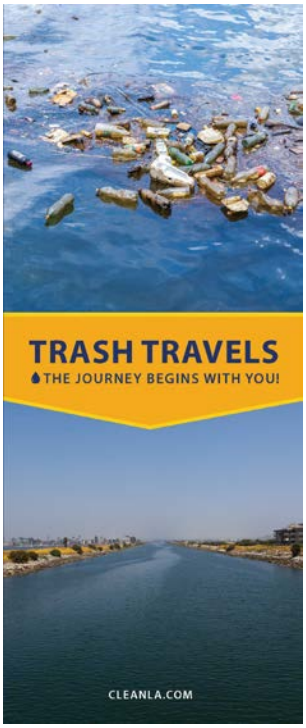
Digital Ads

Educational Brochure

A brochure was developed and distributed at various locations in the watershed with the intent to educate residents on: i) the types and sources of various waste materials that pollutes the environment; ii) how these materials enter waterways and the ocean; and iii) how residents can help to prevent these problems by properly disposing and/or recycling these materials. The brochure (see below) was distributed at retail stores (hardware, pet, and grocery stores), public libraries, and community events.

Facility/Event	Address
Community Events	
Beach Movie Night	12505 Vista Del Mar, Playa Del Rey, CA 90293
Culver City Farmers Market	Downtown Culver City, Main Street
Hardware Stores	
Dick's True Value Hardware	12216 Venice Blvd., Los Angeles, CA 90066
Pet Stores	
Petco Unleashed	13411 Washington Blvd., Marina Del Rey, CA 90292
Petco	5347 Sepulveda Blvd., Culver City, CA 90230
Petco	1873 Westwood Blvd., Los Angeles, CA 90025
Petco Unleashed	1402 Wilshire Blvd., Santa Monica, CA 90403
Petco	8161 Beverly Blvd., Beverly Hills, CA 90048
Grocery Stores	
Vons	6571 W. 80th Street, Los Angeles, CA 90045
Vons	1430 S. Fairfax Ave., Los Angeles, CA 90019
Vons	4030 S. Centinela Ave., Los Angeles, CA 90066
Smart & Final	1833 S. La Cienega Blvd., Los Angeles, CA 90035
Other Sites	
Santa Monica Aquarium	1600 Ocean Front Walk, Santa Monica, CA 90401
Marina Del Rey Library	4533 Admiralty Way, Marina Del Rey, CA 90292
Culver City Library	4975 Overland Ave., Culver City, CA 90230
Los Angeles Central Library	630 W 5th St., Los Angeles, CA 90071
Playa Vista Library	6400 Playa Vista Dr., Playa Vista, CA 90094
Westchester Library	7114 W. Manchester Ave., Los Angeles, CA 90045

Educational Brochure



TRASH TRAVELS

THE JOURNEY BEGINS WITH YOU!

CLEANLA.COM

YOU CAN HELP

Here are ways you can help prevent pollutants from entering waterways:

DO

- Properly dispose of trash in trash containers.
- Sweep paved areas regularly.
- Pick up after your pet.
- Limit pesticide, herbicide and fertilizer use.
- Drop off your household hazardous waste (e.g. unused paint, fertilizer, pesticides, cleaning supplies) at a free local household hazardous waste collection event. *For event schedule, visit: cleanla.com.*
- Call **(888) CLEAN-LA** to report illegal dumping.

DON'T

- Do not over-water your yard.
- Do not hose down sidewalks, driveways, or wash your car in the driveway.
- Do not drain your pool, spa, hot tub or fountain water into the street.
- Do not throw litter on the street or dump anything into storm drains.
- Do not throw unused pesticides in the trash and never pour them on the ground or down storm drains.

Everyone leaves trash and waste behind, whether in their homes, places of work, at a construction site or other locations. A household pet even leaves waste behind.

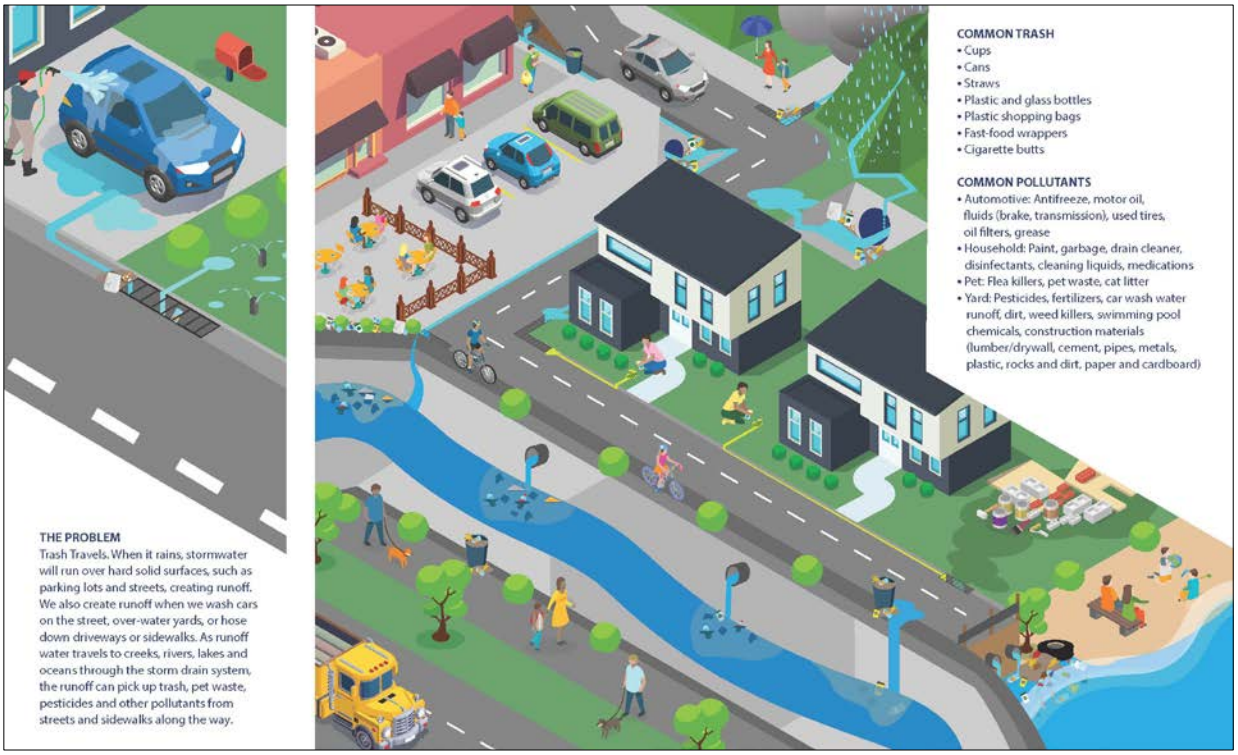
You can make a difference.

Trash, pet waste, pesticides and other pollutants impact the environment. Use trash cans. Pick up after your pet. Minimize pesticide use. Keep communities, waterways and beaches clean.

If you are unsure of the best way to dispose of hazardous household products such as pesticides and to learn more about ways to be more green and less wasteful, visit cleanla.com or call (888) CLEAN-LA (253-2652).

Trash Travels: the journey begins with you!

Printed on recycled paper with soy inks.



THE PROBLEM

Trash Travels. When it rains, stormwater will run over hard solid surfaces, such as parking lots and streets, creating runoff. We also create runoff when we wash cars on the street, over-water yards, or hose down driveways or sidewalks. As runoff water travels to creeks, rivers, lakes and oceans through the storm drain system, the runoff can pick up trash, pet waste, pesticides and other pollutants from streets and sidewalks along the way.

COMMON TRASH

- Cups
- Cans
- Straws
- Plastic and glass bottles
- Plastic shopping bags
- Fast-food wrappers
- Cigarette butts

COMMON POLLUTANTS

- Automotive: Antifreeze, motor oil, fluids (brake, transmission), used tires, oil filters, grease
- Household: Paint, garbage, drain cleaner, disinfectants, cleaning liquids, medications
- Pet: Flea killers, pet waste, cat litter
- Yard: Pesticides, fertilizers, car wash water runoff, dirt, weed killers, swimming pool chemicals, construction materials (lumber/drywall, cement, pipes, metals, plastic, rocks and dirt, paper and cardboard)

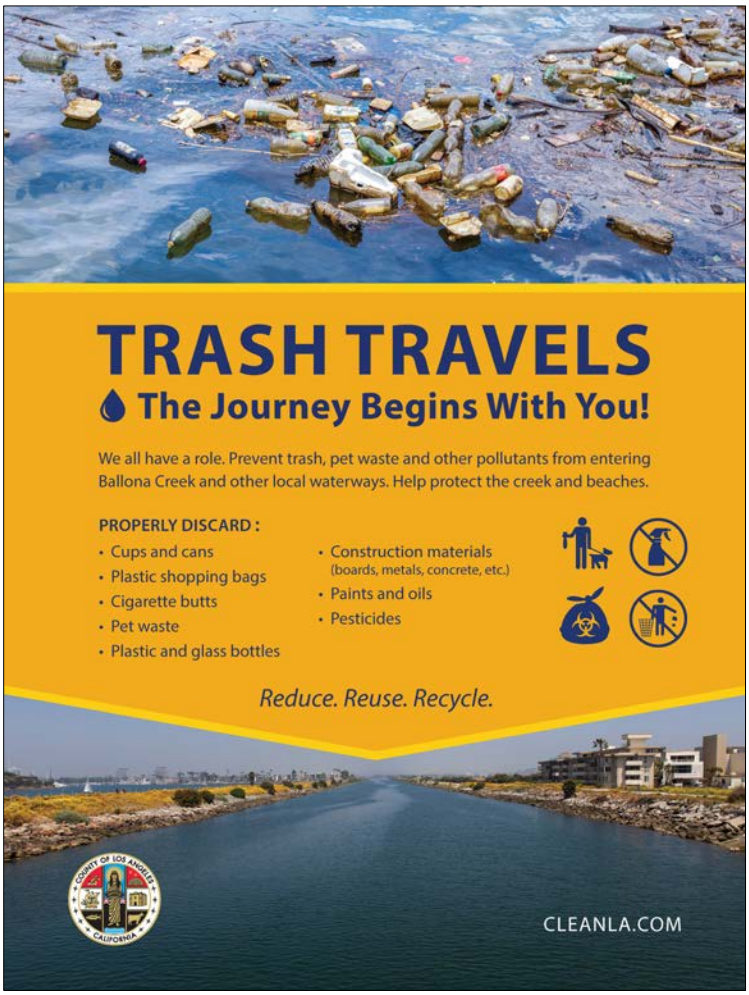
Bike Path Sign

Bike path signs were produced and placed at three locations along the Ballona Creek bike trail to help educate bicyclists and local residents regarding proper disposal of their trash.

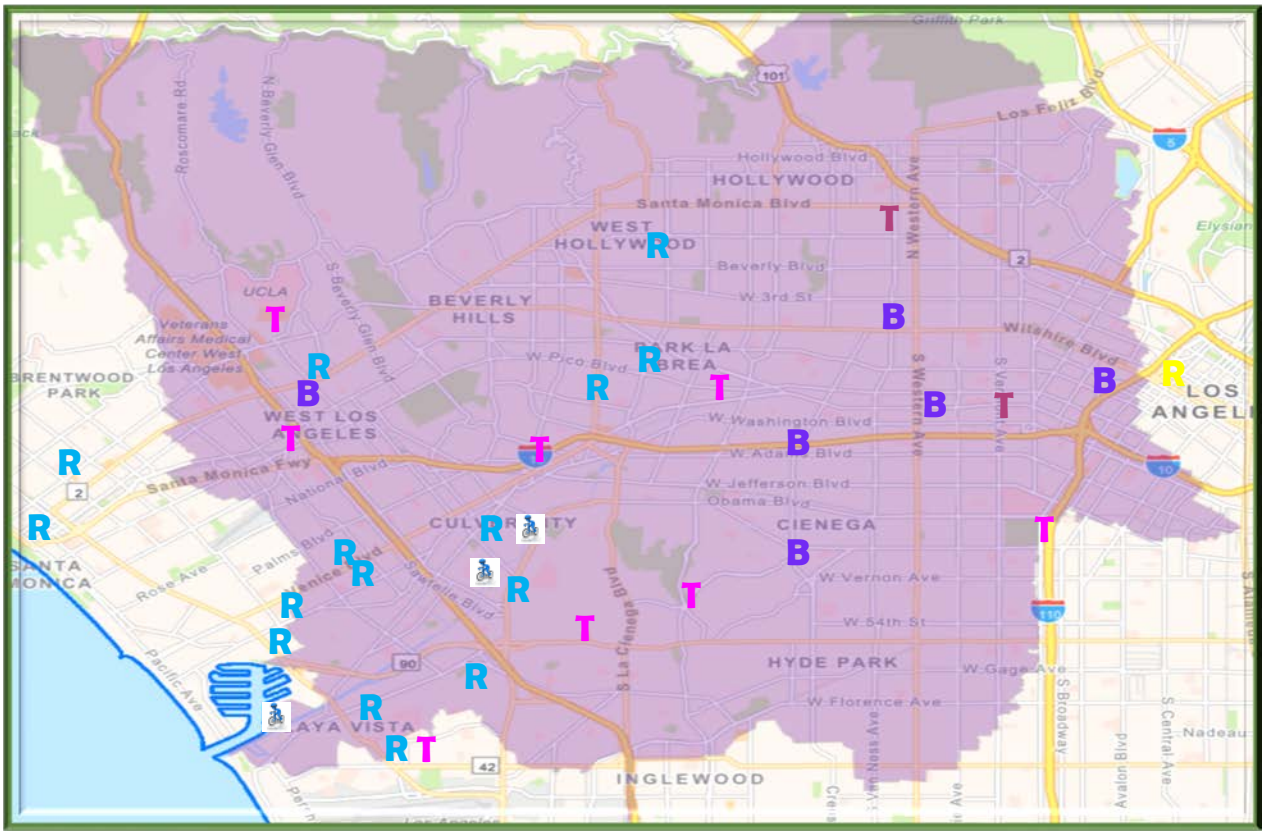
The signs were placed at the following locations along the Ballona Creek Bike Path:

- Intersection of Bike Trail and Fiji Way
- Intersection of Bike Trail and Jackson Avenue
- Culver City Middle School

Bike Path Signs



Location Map for the Various Outreach Efforts



B	Billboard (6)
T/T	Transit Shelter (10)
R	Retail / Others (16)
	Bike Path Sign (3)

Attachment E
Assessment of Grant Funding Opportunities

Grant Program Name	Funding Agency	Upcoming Application Deadline***	Available Funding	Website
Most Appropriate Grant Opportunities*				
Baldwin Hills Conservancy (Prop 1)	Baldwin Hills Conservancy	Tentative: September 30, 2019 December 31, 2019 March 31, 2020 June 30, 2020	$2M FY 19/20	http://www.bhc.ca.gov/grant_opportunities.html
Stormwater Grant Program (Prop 1) - Implementation	State Water Resources Control Board	Tentatively late 2019	$200M (90M for implementation round 2)	http://www.swrcb.ca.gov/water_issues/programs/grants_loans/swgp/docs/prop1.pdf
Other Grant Opportunities Evaluated**				
Bay Delta Restoration Program: CALFED Water Use Efficiency	Bureau of Reclamation	December 2, 2019	$1.5M ($500K/award)	
California Watershed Protection Fund	Rose Foundation	August 16, 2019 (Letter of Inquiry) October 18, 2019 (Application Deadline)	$7,500- $25,000	http://rosefdn.org/california-watershed-protection-fund
Clean Beaches Initiative	SWRCB	TBA	$25M ($5M/award)	http://www.waterboards.ca.gov/water_issues/programs/beaches/cbi_projects/
Clean Water State Revolving Fund	Waterboards	TBA	Unspecified ($1-100M/award)	http://www.waterboards.ca.gov/water_issues/programs/grants_loans/srf/index.shtml
Clean, Safe, and Reliable Drinking Water (Prop 1)	SWRCB	Rolling	$260M	http://www.waterboards.ca.gov/water_issues/programs/grants_loans/dwsrf/scoping_workshops.shtml
Climate Ready Grant Program	CA Coastal Conservancy	Closed July 1, 2019	$1.35M ($550K/award)	http://scc.ca.gov/2013/04/24/grant-opportunities/
Coastal and Marine Habitat Restoration	NOAA	TBA	$6M ($75K-$3M/award)	http://www.habitat.noaa.gov/funding/coastalrestoration.html
Community Forest and Open Space Conservation Program	US Forest Service Office of Agr.	New cycle will begin September-October 2019	$1.68M ($400K/award)	http://www.fs.fed.us/spf/coop/programs/loa/cfp.shtml

*Grants that were evaluated to be the most promising and competitive for the proposed projects.
**These grants opportunities were looked at on a case by case basis. They are often less competitive for this type of project, have smaller available funding, and periodic availability.
***Grants are often renewable and have multiple application rounds.

Assessment of Grant Funding Opportunities

Grant Program Name	Funding Agency	Upcoming Application Deadline***	Available Funding	Website
Community Wetland Restoration	Southern CA Wetlands Recovery	2/23/2018 (info not updated for new FY)	$160K ($20K-$30K/award)	https://scwrp.org/cwrgp-info-and-app-guidelines-rfp-2018/
Drought Response Outreach Program for Schools (DROPS)	CA EPA SWRCB	Solicitation closed	$32M	http://www.waterboards.ca.gov/water_issues/programs/grants_loans/drops/index.shtml
Drought Response Program	US Bureau of Reclamation	TBA	$9M ($750K/max award)	http://www.usbr.gov/drought/
Environmental Enhancement & Mitigation Program (EEMP)	CA Natural Resources Agency	Closed for 2019-2020 cycle	$7M	http://resources.ca.gov/grants/environmental-enhancement-and-mitigation-eem/
Facilities Planning	SWRCB	TBA	50% of costs for a project. The project max is $75,000	http://www.waterboards.ca.gov/water_issues/programs/grants_loans/water_recycling/facilitiesplan.shtml
Five Star and Urban Water Restoration	US Fish and Wildlife Foundation	January 31, 2019	$1.7M ($20K-50K/award)	http://www.nfwf.org/fivestar/Pages/home.aspx
Flood Corridor Projects	CA DWR	TBA	approx. $132M left over	http://www.water.ca.gov/grantsloans/grants/corridor.cfm
Flood Emergency Response Projects	CA DWR	TBA	$10M	http://www.water.ca.gov/floodmgmt/hafoo/fob/floodER/
Flood Mitigation Assistance	FEMA	TBA	$160M (up to 10M award)	http://www.caloes.ca.gov/for-governments-tribal/grants-funding/pre-disaster-flood-mitigation
Groundwater Sustainability (Prop 1)	SWRCB	Rolling	$900M ($100K-$8M/award)	www.waterboards.ca.gov/water_issues/programs/gmp/index.shtml

Assessment of Grant Funding Opportunities

Grant Program Name	Funding Agency	Upcoming Application Deadline***	Available Funding	Website
Habitat Conservation Fund	CA Dept of Parks & Recreation	October 1, 2018	$2M	http://www.parks.ca.gov/?page_id=21361
Habitat Enhancement and Restoration	Wildlife Conservation Board	Applications are accepted on a continuous basis	Unspecified	https://www.wcb.ca.gov/Applications
Integrated Regional Water Management Planning Grant (Prop 1) Implementation	DWR	Summer 2019 (tentative)	$510M	http://water.ca.gov/irwm/grants/prop1index.cfm
Land & Water Conservation Fund Local Agency	CA Dept of Parks & Recreation	New cycle will begin 2020 at the earliest	$13.3M (250K-750K/ award)	http://www.parks.ca.gov/?page_id=21360
Local Levee Assistance Program (LLAP): Critical Repair / Evaluation	CA DWR	TBA	$83M	http://www.water.ca.gov/floodmgmt/fpo/sgb/llap/
Local Resources Program	MWD	TBA	Unknown	http://www.mwdh2o.com/PDF_About_Your_Water/2.4.3.1_Local_Resources_Program_Application.pdf
Marine Debris Prevention Through Education and Outreach	NOAA	Closed for FY 2019	TBA (award ranges from $50K to $150K)	http://marinedebris.noaa.gov/funding/funding-opportunities
Multibenefit Water Quality, Water Supply, and Watershed Protection and Restoration Program (Prop 1)	San Gabriel and Lower LA Rivers and Mountains Conservancy	TBA	Unknown	http://www.rmc.ca.gov/Final_RMC_Guidelines_Oct2015.pdf
Non-Point Source Grant Program	SWRCB	December 18, 2018	2M ($250K min 750K max)	http://www.waterboards.ca.gov/water_issues/programs/nps/solicitation_notice.shtml
Productivity Investment Fund	Quality and Productivity Commission	July 12, 2019 October 4, 2019	3M (grants typically do not exceed 250K)	qpc.lacounty.gov
Proposition 1 Grant Program	Santa Monica Mountains Conservancy	August 30, 2019	$24M ($250K-$1M/award)	http://smmc.ca.gov/

Assessment of Grant Funding Opportunities

Grant Program Name	Funding Agency	Upcoming Application Deadline***	Available Funding	Website
Public Water System Drought Emergency (PWSDE) Response Program	CA SWRCB	Rolling	$687.4M ($500K/award)	http://www.waterboards.ca.gov/drinking_water/certlic/drinkingwater/documents/drought/PWSDE%20-%20Drought%20Emergency%20-%20Criteria(Guidelines)%203-28-14-final.pdf
Recreational Trails: Motorized and Non-Motorized	CA Dept of Parks & Recreation	Application cycle expected in Spring 2020	TBD	http://www.parks.ca.gov/?page_id=24324
Riparian Habitat Conservation	Wildlife Conservation Board	Rolling	Unspecified	https://www.wcb.ca.gov/Applications
Source Reduction Assistance *Also called Pollution Prevention (P2)	EPA	TBA	$4.6M ($25-75K/award)	http://www.epa.gov/region9/funding/funding-sources/source-reduction.html
State Coastal Conservancy Proposition 1 Grant Program ROUND 3	CA Coastal Conservancy	TBA	$100.5M	http://scc.ca.gov/2015/02/02/proposition-1-water-quality-supply-and-infrastructure-improvement-act-of-2014/
Stormwater Grant Program (Prop 1) - Planning	SWRCB	TBA	$180M	https://www.waterboards.ca.gov/water_issues/programs/grants_loans/swgp/prop1/
Stream Flow Enhancement Program (Prop 1) ROUND 2	Wildlife Conservation Board	September 10, 2019	$64M ($2.5M/max for scientific studies)	https://www.wcb.ca.gov/Applications
Sustainable Groundwater Planning (Prop 1)*Now funded by Prop 68*	DWR	TBA	$88M	http://www.water.ca.gov/irwm/grants/sgwp/
Tire-Derived Aggregate	CalRecycle	August 1, 2019 October 31, 2019 January 30, 2020	$850K ($350K/award)	http://www.calrecycle.ca.gov/tires/Grants/TDA/default.htm

Assessment of Grant Funding Opportunities

Grant Program Name	Funding Agency	Upcoming Application Deadline***	Available Funding	Website
Tire-Derived Product	Cal Recycle	August 1, 2019 October 31, 2019 January 30, 2020	$850K ($350K/award)	http://www.calrecycle.ca.gov/Tires/Grants/Product/default.htm
Urban and Community Forestry: Green Trees for the Golden State	CALFIRE	TBA	Unspecified ($150 - 750K/award)	http://www.fire.ca.gov/grants/grants.php
Urban Streams Restoration	DWR	TBA	Unspecified ($1K - 1M/award)	http://www.water.ca.gov/urbanstreams/
Urban Waters Small Grant	EPA	TBA	$2.2M ($40-60K/award)	http://www2.epa.gov/urbanwaters/urban-waters-small-grants
Water Conservation Field Services	DOI BOR	TBA	Unknown (Updating program)	http://www.usbr.gov/waterconservation/
Water Recycling Desalination Grants (Prop 1)	DWR	Continuous basis effective March 2018	$48.7M	http://www.water.ca.gov/desalination/2016Cycle4.cfm
Water Recycling Grants (Prop 1)	SWRCB	Rolling	$625M	http://www.waterboards.ca.gov/water_issues/programs/grants_loans/water_recycling/docs/wrfp_guidelines.pdf
Water Storage Investment Program (Prop 1)	CA Water Commission	Closed for FY 2019	$2.7B	https://www.acwa.com/news/cwc-hosts-water-storage-investment-program-application-assistance-workshop/
Water Use Efficiency (Prop 1)	DOI BOR	TBA	$100M for five programs	calconserve.cfm

Assessment of Grant Funding Opportunities

Grant Program Name	Funding Agency	Upcoming Application Deadline***	Available Funding	Website
Water-Energy Grant Program	DWR	TBA	$19M	http://www.water.ca.gov/waterenergygrant/
Watershed Restoration and Delta Water Quality and Ecosystem Restoration Grant Program (Prop 1)	Dept of Fish and Wildlife	No solicitations open	Unspecified	https://www.wildlife.ca.gov/Conservation/Watersheds/Restoration-Grants
WaterSMART: Development of Feasibility Studies Under Title XVI Water Reclamation and Reuse	DOI BOR	TBA	$19M	http://www.usbr.gov/WaterSMART/grants.html
WaterSMART: Basin Study	DOI BOR	TBA	$19M	http://www.usbr.gov/WaterSMART/grants.html
WaterSMART: Title XVI Water Reclamation and Reuse Program	DOI BOR	September 23, 2019	$19M ($750K-$3M/award)	http://www.usbr.gov/WaterSMART/grants.html
WaterSMART: Water & Energy Efficiency	DOI BOR	TBA	$29.1M	http://www.usbr.gov/WaterSMART/grants.html
Wetland Program Development	EPA	TBA	Not specified	http://water.epa.gov/grants_funding/wetlands/grantguidelines/index.cfm
Whale Tail Grant Program	CA Coastal Commission	*Will be announced after Labor Day 2019	TBA	http://www.coastal.ca.gov/publiced/plate/plgrant.html