

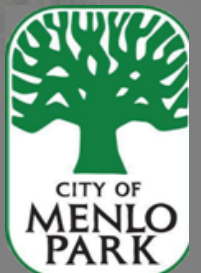
2022

Long Term Trash Load Reduction Plan and Assessment Strategy

The goal of this plan is to minimize litter problems in local creeks and the San Francisco Bay by reducing litter in water discharges from the city's stormdrain system. In compliance with Provisions C.10.c of Order R2-2009-0074, this plan describes how the City of Menlo Park plans to attain a 70% litter load reduction by July 1, 2017, and 100% (or "No Visual Impact") by July 1, 2022.



City of Menlo Park
701 Laurel Street
Menlo Park, CA 94025
2/1/2014




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**City of Menlo Park
LONG-TERM TRASH LOAD REDUCTION PLAN AND
ASSESSMENT STRATEGY**

CERTIFICATION STATEMENT

"I certify, under penalty of law, that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to ensure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted, is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations."

Signature by Duly Authorized Representative:



Charles W. Taylor
Public Works Director
January 31, 2014

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ABBREVIATIONS

BASMAA	Bay Area Stormwater Management Agencies Association
BID	Business Improvement District
CalRecycle	California Department of Resources Recycling and Recovery
Caltrans	California Department of Transportation
CASQA	California Stormwater Quality Association
CDS	Continuous Deflection Separator
CEQA	California Environmental Quality Act
CY	Cubic Yards
EIR	Environmental Impact Report
EPA	Environmental Protection Agency
GIS	Geographic Information System
MRP	Municipal Regional Stormwater NPDES Permit
MS4	Municipal Separate Storm Sewer System
NGO	Non-Governmental Organization
NPDES	National Pollutant Discharge Elimination System
Q	Flow
SFRWQCB	San Francisco Regional Water Quality Control Board
SWRCB	State Water Resource Control Board
TMDL	Total Maximum Daily Load
USEPA	United States Environmental Protection Agency
Water Board	San Francisco Regional Water Quality Control Board
WDR	Waste Discharge Requirements

PREFACE

This Long-Term Trash Load Reduction Plan and Assessment Strategy (Long-Term Plan) is submitted in compliance with provision C.10.c of the Municipal Regional Stormwater NPDES Permit (MRP) for Phase I communities in the San Francisco Bay (Order R2-2009-0074). The Long-Term Plan was developed using a regionally consistent outline and guidance developed by the Bay Area Stormwater Management Agencies Association (BASMAA) and reviewed by San Francisco Bay Regional Water Quality Control Board staff. The Long-Term Plan is consistent with the Long-Term Trash Load Reduction Framework developed in collaboration with Water Board staff. Its content is based on the City of Menlo Park's current understanding of trash problems within its jurisdiction and the effectiveness of control measures designed to reduce trash impacts associated with Municipal Separate Storm Sewer (MS4 or stormdrain system) discharges. This Long-Term Plan is intended to be iterative and may be modified in the future based on information gained through the implementation of trash control measures. The City of Menlo Park therefore reserves the right to revise or amend this Long-Term Plan at its discretion. If significant revisions or amendments are made by the City a revised Long-Term Plan will be submitted to the Water Board through the City's annual reporting process.

1.0 INTRODUCTION

1.1 Purpose of the Long Term Trash Load Reduction Plan

The Municipal Regional Stormwater National Pollutant Discharge Elimination System (NPDES) Permit for Phase I communities in the San Francisco Bay (Order R2-2009-0074), also known as the Municipal Regional Permit (MRP), became effective on December 1, 2009. The MRP applies to 76 large, medium and small cities, towns and counties, including Menlo Park, and flood control agencies in the San Francisco Bay Region, collectively referred to as Permittees. Provision C.10.c of the MRP requires Permittees to submit a *Long-Term Trash Load Reduction Plan* (Long-Term Plan) by February 1, 2014. Long-Term Plans must describe control measures that are currently being implemented, including the level of implementation, and additional control measures that will be implemented and/or increased level of implementation designed to attain a 70% trash load reduction by July 1, 2017, and 100% (or “No Visual Impact”) by July 1, 2022.

This Long-Term Plan is submitted by the City of Menlo Park in compliance with MRP provision C.10.c. The goal of this plan is to solve trash problems in local creeks and the San Francisco Bay by reducing litter in discharges of the city’s separate municipal stormdrain system (MS4) that are regulated by NPDES Permit requirements. The Long-Term Plan includes:

1. Description of current trash control implementation measures, and the type and extent to which new or enhanced control measures will be implemented to achieve a target of 100% (or “No Visual Impact”) trash reduction from the city’s stormdrain system by July 1, 2022, with an interim milestone of 70% reduction by July 1, 2017;
2. A description of the *Trash Assessment Strategy* that will be used assess progress towards trash reduction targets achieved as a result of control measure implementation; and,
3. Time schedules for implementing control measures and the assessment strategy.

The Long-Term Plan was developed using a regionally consistent outline and guidance developed by the Bay Area Stormwater Management Agencies Association (BASMAA) and reviewed by the San Francisco Bay Regional Water Quality Control Board (Water Board) staff. The Long-Term Plan is consistent with the Long-Term Trash Load Reduction Framework (see “Background” section) developed in collaboration with Water Board staff. Its content is based on the City of Menlo Park’s current understanding of trash problems within its jurisdiction and the effectiveness of control measures designed to reduce litter in stormwater discharges. The Long-Term Plan builds upon trash control measures implemented by the City prior to the adoption of the MRP and during the implementation of the Short-Term Trash Load Reduction Plan submitted to the Water Board on February 1, 2012.

Section 2.0 of this plan is intended to provide a description of the extent and magnitude of the trash problem in the City of Menlo Park. Control measures that will be implemented by the City of Menlo Park as a result of this Long-Term Plan are described in section 3.0. Section 4.0 describes the methods that will be used to assess progress toward trash reduction targets.

1.2 Background

Long-Term Trash Load Reduction Plan Framework

A workgroup of MRP Permittee, Bay Area countywide stormwater program staff and Water Board staff met between October 2012 and March 2013 to better define the process for developing and implementing Long-Term Plans, methods for assessing progress toward reduction goals, and tracking and reporting requirements associated with provision C.10. Through these discussions, an eight-step framework for developing and implementing Long-Term Plans was created by the workgroup (Figure 1).

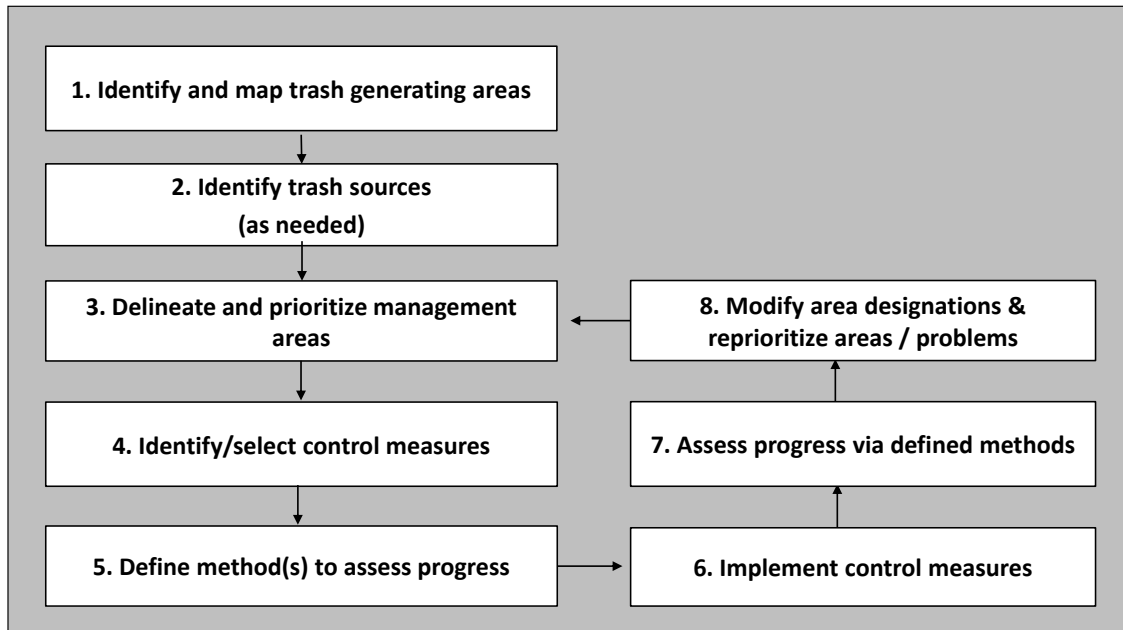


Figure 1. Eight-step framework for developing, implementing and refining Long-Term Trash Reduction Plans.

The workgroup agreed that as the first step in the framework, Permittees would identify very high, high, moderate, and low trash generating areas in their jurisdictional areas. Trash generation rates developed through the *BASMAA Baseline Trash Generation Rates Project* (as discussed below) were used as a starting point for differentiating and delineating land areas with varying levels of trash generation. Permittees would then use local knowledge and field and/or desktop assessments to confirm or refine the level of trash generation for specific areas within their jurisdiction. Each Permittee would then develop a map depicting trash generation categories within their jurisdiction.

As a next step, Permittees would then delineate and prioritize Trash Management Areas (TMAs) where specific control measures exist or are planned for implementation. TMAs delineated by Permittees are intended to serve as reporting units in the future. Reporting at the management area level provides the level of detail necessary to demonstrate implementation and progress towards trash reduction targets.

Once control measures are selected and implemented, Permittees will evaluate progress toward trash reduction targets using outcome-based assessment methods. As the results of the progress assessments are available, Permittees may choose to reprioritize trash management areas and associated control measures designed to improve trash reduction within their jurisdictions.

BASMAA Generation Rates Project

Through approval of a BASMAA regional project in 2010, Permittees agreed to work collaboratively to develop a regionally consistent method to establish trash generation rates within their jurisdictions. The project, also known as the *BASMAA Trash Generation Rates Project* (Generation Rates Project) assisted Permittees in establishing the rates of trash generation and identifying very high, high, moderate and low trash generating areas.

The term “trash generation” refers to the rate at which litter is produced or generated onto the surface of the watershed and is potentially available for transport via the stormdrain system to receiving waters. Generation rates do not explicitly take into account existing control measures that intercept litter prior to transport. Generation rates are expressed as trash gallons/acre/year and were established via the Generation Rates Project.

In contrast to trash generation, the term “trash loading” refers to the rate at which litter from the stormdrain system enters receiving waters. Trash loading rates are also expressed as trash gallons/acre/year and are equal to or less than trash generation rates because they account for the effects of control measures that intercept litter generated in an area before it is discharged to a receiving water. Trash loading rates are specific to particular areas because they are dependent upon the effectiveness of control measures implemented within an area. Figure 2 illustrates the difference between trash generation and loading.

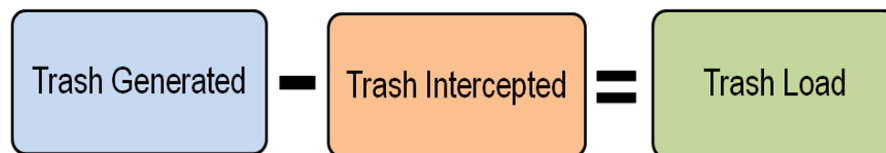


Figure 2. Conceptual model of trash generation, interception and load.

Trash generation rates were estimated based on factors that significantly affect trash generation (e.g. land use and income). The method used to establish trash generation rates for each Permittee builds off “lessons learned” from previous trash loading studies conducted in urban areas (Allison and Chiew 1995; Allison et al. 1998; Armitage et al. 1998; Armitage and Rooseboom 2000; Lippner et al. 2001; Armitage 2003; Kim et al. 2004; County of Los Angeles 2002, 2004a, 2004b; Armitage 2007). The method is based on a conceptual model developed as an outgrowth of these studies (BASMAA 2011b).

Trash generation rates were developed through the quantification and characterization of litter captured in Water Board-recognized full-capture treatment devices installed in the San Francisco Bay area. Trash generation rates estimated from this study are listed for each land use type in Table 1. Methods used to develop trash generation rates are more fully described in the BASMAA report (2011b, 2011c, and 2012).

Table 1. San Francisco Bay Area trash generation rates by land use.

Land Use	Low ^b gallons/acre/yr	Best ^b gallons/acre/yr	High ^b gallons/acre/yr
Commercial & Services	0.7	6.2	17.3
Industrial	2.8	8.4	17.8
Residential ^a	0.3 - 30.2	0.5 - 87.1	1.0 - 257.0
Retail ^a	0.7 - 109.7	1.8 - 150.0	4.6 - 389.1
K-12 Schools	3	6.2	11.5
Urban Parks	0.5	5.0	11.4

^a For residential and retail land uses, trash generation rates are provided as a range that takes into account the correlation between rates and household median income.

^b For residential and retail land uses: Low = 5% confidence interval; Best = best fit regression line between generation rates and household median income; and, High = 95% confidence interval. For all other land use categories: High = 90th percentile; Best = mean generation rate; and, Low = 10th percentile.

Short-Term Trash Load Reduction Plan

In February 2012, the City of Menlo Park developed a Short-Term Plan that described the current level of implementation for litter control measures and identified the type and extent to which new or enhanced control measures would be implemented to attain a 40% trash load reduction from the City's stormdrain system by July 1, 2014. Since that time, the City of Menlo Park has started to implement its short-term plan. Control measures implemented to date via the short-term trash reduction plan are:

- 1. Implementation of a Single Use Carryout Plastic Bag Policy (Implemented Earth Day-April 22, 2013)** - The City of Menlo Park's Council adopted a Reusable Bag Ordinance on January 22, 2013. The ordinance prohibits the distribution of single use plastic bags at all retail establishments, and includes charging a dime (\$0.10) for single use paper bags at checkout that will be increased to a quarter (\$0.25) on January 1, 2015. The ordinance took effect on Earth Day (April 22, 2013) well in advance of the targeted implementation date of July 1, 2014.
- 2. Polystyrene Food Service Ordinance (Implemented November 2012)**- Prohibits food vendors, including restaurants, delis, cafes, markets, fast-food establishments, vendors at fairs, and food trucks from dispensing prepared food in polystyrene containers labeled as No. 6. The ordinance took effect on November 1, 2012 well in advance of the targeted implementation date of July 1, 2014.
- 3. Public Education and Outreach Programs (Implemented and Ongoing)** - Menlo Park participates in BASMAA's Youth Outreach Campaign and regional media relations project. In addition, through collaboration with San Mateo County Stormwater Pollution Prevention Program, Menlo Park supports a number of educational programs from youth to adults. Menlo Park also annually hosts a Coastal Cleanup Day site where volunteers are educated about the effects of litter on water quality. Menlo Park also annually contributes financially to Acterra, a nonprofit organization that focuses on creek and water quality stewardship. Acterra hosts several cleanup and educational events throughout the year for youth and adults.

4. **Improved Trash Bin/Container Management (In Progress)** - The city developed a comprehensive strategic plan for managing public area garbage and recycling containers to further reduce litter. The plan includes relocating, adding, and modifying bin designs to capture more trash. Phases of the plan will be implemented over the next three years or sooner. See Appendix A.
5. **Enhanced Street Sweeping (Implemented Pre-MRP)**-The City of Menlo Park has already implemented a robust street sweeping program in areas considered medium or high trash generating. For example, the downtown area is swept twice per week all year long. In addition, “No Overnight Parking” signage is enforced in retail, downtown, and commercial areas, allowing the early morning street sweeping schedule to access the curb for litter pickup.
6. **Full Capture Devices (Implemented January 2013)** - Menlo Park has 25 full capture devices installed in stormdrain basins, which exceeds Menlo Park’s requirements for the MRP and proposed implementation in the short term plan.

Control measures described in this Long-Term Plan build upon actions taken to-date via the City of Menlo Park’s Short-Term Plan. A full description of control measures implemented via short and long-term plans is included in section 3.2. Outcomes associated with short-term plan implementation will be reported in the City of Menlo Park’s Fiscal Year 2013-14 Annual Report, scheduled for submittal to the Water Board by September 15, 2014.

2.0 SCOPE OF THE TRASH PROBLEM

2.1 Permittee Characteristics

Incorporated in 1874, the City of Menlo Park is located in San Mateo County, and has a population of 32,026 with a population density of 1,839 people per square mile (2010 Census). The average household size is 2.53, and the ethnic makeup of Menlo Park is 70.2% white, 9.9% Asian, 4.8% African American, and 15.1% other (2010 Census). The median value of an owner occupied unit is \$1.1 million, and the median household income is \$107,860 (Menlo Park Housing Element 2007-2014). In addition, the city is a host to 29,400 employees per day (Menlo Park Housing Element 2007-2014).

The City of Menlo Park is also home to many venture capital businesses and large research firms, such as Facebook, Tyco Electronics, Intuit, Pacific Biosciences, United States Geological Survey, SRI International, and SLAC National Accelerator Labor. Three major state transportation corridors run through Menlo Park: Highway 101, Highway 280, and El Camino Real.

Highway 101 is also a socioeconomic border. The neighborhoods east to Highway 101 are typically lower income households compared to the higher income households on the west side of Menlo Park. This demographic data is key to understanding litter issues in Menlo Park that would impact stormwater quality.

Jurisdictional land uses within Menlo Park and associated acreage are provided in Table 2 (2005 ABAG's land use data set). Menlo Park is comprised of several types of land uses that include commercial, industrial, residential, retail, schools, and urban parks.

Table 2: Percentages of the City of Menlo Park's jurisdictional area within land use classes identified by ABAG (2005)

Land Use Category	Jurisdictional Area (Acres)	% of Jurisdictional Area
Commercial and Services	673.9	13.2%
Industrial	363.5	7.1%
Residential	2,225.0	43.6%
Retail	114.3	2.2%
K-12 Schools	102.6	2.0%
Urban Parks	37.9	0.7%

The City of Menlo Park's jurisdictional areas includes all urban land areas within the City of Menlo Park boundaries that are subject to the requirements of the MRP. Land use areas identified by a combination of the ABAG 2005 land use dataset and Permittee knowledge that were not included within the City's jurisdictional areas include:

- Federal and State of California Facilities and Roads (e.g. Interstates, State Highways, such as Highway 101, 280, and El Camino Real, Military Bases, and Prisons)
- Roads and Parks Owned and Maintained by San Mateo County

- Colleges and Universities (Private and Public)
- Non-urban Land Uses (e.g. agriculture, forest, rangeland, open space, wetlands, water)
- Communication or Power Facilities
- Other Transportation Facilities (e.g. airports, railroads, and maritime shipping ports).

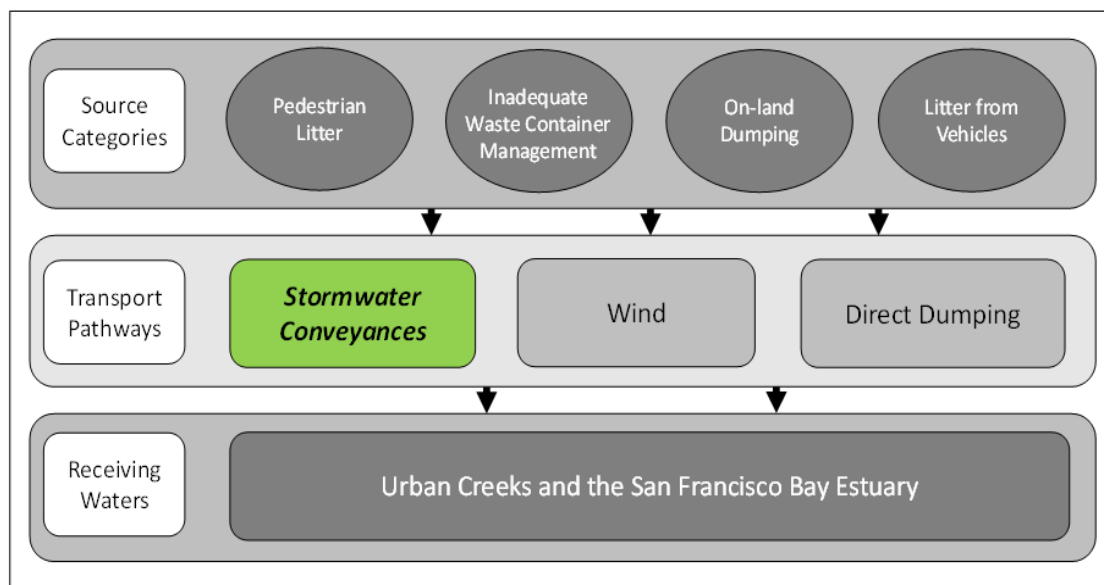
2.2 Trash Sources and Pathways

Trash/litter in San Francisco Bay Area creeks and shorelines originate from a variety of sources and are transported to receiving waters by a number of pathways (Figure 3). Of the four source categories, pedestrian litter includes trash sources from high traffic areas near businesses and schools, transitional areas (e.g. bus stops) where food/drinks may not be permitted on public transit, and from public or private special events with high volumes of people. Trash from vehicles occurs due to littering from automobiles and uncovered loads. Inadequate waste container management includes sources such as overflowing or uncovered containers and dumpsters as well as the dispersion of household and business-related trash and recycling materials before, during, and after collection. On-land illegal dumping of trash is the final source category.

Trash is transported to receiving waters through three main pathways: 1) Stormwater Conveyances; 2) Wind; and, 3) Direct Dumping. Stormwater or urban runoff conveyance systems (e.g., stormdrain systems) consist of curbs/gutters, and pipes and channels that discharge to urban creeks and the San Francisco Bay shorelines. Wind can also blow trash directly into creeks or the Bay. Lastly, trash in receiving waters can also originate from direct dumping into urban creeks and shorelines.

This Long-term Plan and associated trash control measures described in Section 3.0 are focused on reducing trash from one of the transport pathways illustrated in Figure 3– **stormwater conveyances**. Specifically, the Long-term Plan is focused on reducing the impacts of discharges from stormdrain systems to San Francisco Area receiving waters and the protection of associated beneficial uses.

Figure 3. Trash sources categories and transport pathways to urban creeks.



For wind and direct dumping, the City of Menlo Park continues to address these transport pathways through on-land or in-creek cleanups. The city annually hosts a San Francisquito Creek cleanup event to remove trash related to wind and direct dumping. In addition, the City of Menlo Park annually contributes financially to Acterra, a nonprofit organization that hosts several creek cleanup activities throughout the year in Menlo Park.

Over the next few years, city staff will analyze costs to survey and monitor areas that continually experience illegal dumping. Possible solutions include installing cameras in order to issue fines to violators. The City of Menlo Park is also updating its General Plan that includes developing more resources and support to help homeless residents to find a place to live, which would reduce waste related to homeless encampments.

2.3 Trash Generating Areas

Generation Categories and Designation of Areas

The process and methods used to identify the level of trash generation within the City of Menlo Park are described in this section and illustrated in Figure 4.

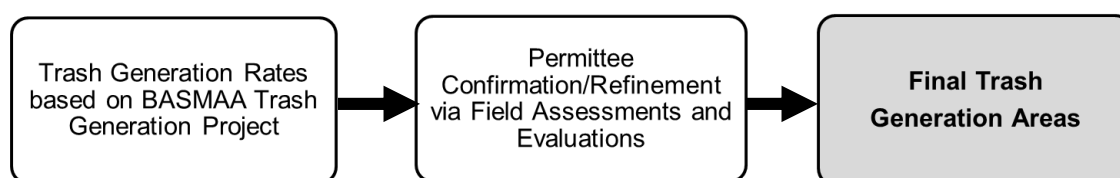


Figure 4. Process used to develop trash generation areas.

As a first step, trash generation rates developed through *the BASMAA Trash Generation Rates Project* were applied to parcels within the City of Menlo Park based on current land uses and 2010 household median incomes as they relate to potential litter opportunities or behaviors. A Draft Trash Generation Map was created as a result of this application. The draft map served as a starting point for the City of Menlo Park to identify trash generating levels. Levels of trash generation are depicted on the map using four trash generation rate categories that are symbolized by four different colors illustrated in Table 3.

Table 3: Trash generation categories and associated generation rates (gallons/acre/year).

Category	Very High	High	Moderate	Low
Generation Rate (gallons/acre/year)	> 50	10-50	5-10	< 5

The City of Menlo Park then reviewed and refined the draft trash generation map to ensure that trash generation categories were correctly assigned to parcels or groups of parcels. City staff refined maps using the following process:

1. Based upon knowledge of trash/litter generation and problem areas within the City, staff identified areas on the draft map that potentially had incorrect trash generation category designations.
2. Trash generation category designations initially assigned to areas identified in step #1 were then assessed and confirmed/refined by the City using the methods listed below.

a. On-Land Visual Assessments

To assist Permittees with developing their trash generation maps, BASMAA developed a *Draft On-land Visual Trash Assessment Protocol (Draft Protocol)*. The Draft Protocol entails walking a street segment and visually observing the level of trash present on the roadway, curb and gutter, sidewalk, and other areas adjacent to the street that could potentially contribute trash to the stormdrain system. Based on the level of trash observed, each segment (e.g. assessment area) was placed into one of four on-land assessment condition categories that are summarized in Table 4.

Table 4. Definitions of on-land trash assessment condition categories.

On-land Assessment Condition Category	Summary Definition
A (Low)	Effectively no trash is observed in the assessment area.
B (Moderate)	Predominantly free of trash except for a few pieces that are easily observed.
C (High)	Trash is widely/evenly distributed and/or small accumulations are visible on the street, sidewalks, or inlets.
D (Very High)	Trash is continuously seen throughout the assessment area, with large piles and a strong impression of lack of concern for litter in the area.

Based on the initial Draft Trash Generation Map, 29 out of 52 potential assessment areas in Menlo Park were considered high or medium trash generating areas. Using the Draft Protocol, the City's environmental program staff visually assessed all 29 areas that were considered high or medium trash generating areas. Staff inspected these areas in May, June, and November of 2013 between street sweeping days to ensure the most accurate visual assessment.

Staff found that about half (51%) of the designations needed to be changed on the Draft Trash Generation Map. In particular, staff found that many medium trash generating areas had little to no litter or trash. However, the initial Draft Trash Generation Map was accurate in designating most of the high trash generation areas.

As a result of the visual assessments, 13 medium trash generating areas were changed to low. Two sites were found to have more litter than estimated, and were changed from low to medium.

b. Querying Municipal Staff or Members of the Public

In addition to the visual assessments, environmental program staff consulted with longtime residents to verify the results of the visual assessments and confirm low trash generation areas based upon their knowledge of specific neighborhoods. Field municipal staff (e.g. maintenance crews, inspectors, and land use planners) were also consulted to verify the visual assessments and low trash generation areas. This resulted in further refinement of exact locations of litter issues, such as only designating a particular stretch of Chilco Road on the east side of Menlo Park rather than designating the entire area adjacent to Chilco Road as medium trash generating area. Many of the visual assessments were confirmed correct by residents or municipal staff.

In addition, the City also hired a consultant, Cascadia Consulting Group Inc., to develop a Strategic Public Trash and Recycling Bin Management Plan to reduce litter caused by overflow of public trash bins or inadequate bin infrastructure. The plan required extensive field data for over 330 public trash and recycling bins in Menlo Park. The scope of work also included focusing on high or medium trash generation areas defined by the initial Draft Trash Generation Map. Data collection occurred from July through August of 2013. During the field surveys, the consultants found three areas that should be changed from high trash generating to low because there was little to no litter in the area. Staff confirmed this through a site visit and changed the trash generation map accordingly.

This method verified all 52 potential trash generation areas within the jurisdiction of Menlo Park.

c. Viewing Areas via Goggle Maps – Street View

Staff also used the Google Maps' Street View program to provide a third layer of verification for the visual site assessments and public/municipal staff knowledge. All 52 sites were reviewed using this program, and the results confirmed the previous findings from the site assessments and the public/staff query methods.

3. Based on assessments conducted to confirm/refine trash generation category designations, the City created a final trash generation map that depicts the most current understanding of trash generation within the City of Menlo Park. The City documented this process by tracking the information collected through the assessments and subsequent refinements to the Draft Trash Generation Map. The City of Menlo Park's Final Trash Generation Map is included as Figure 5.

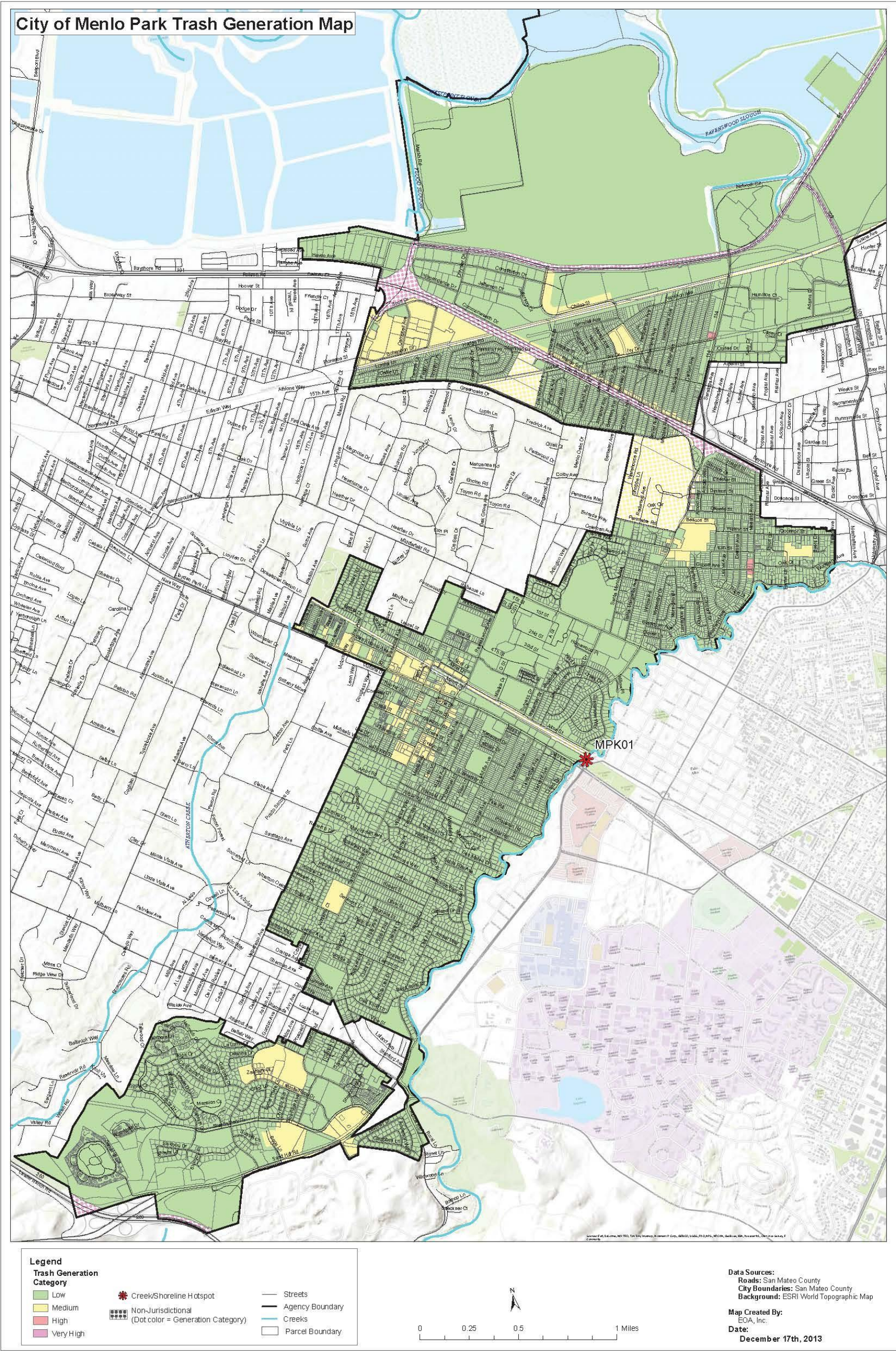
Summary of Trash Generating Areas and Sources

Summary statistics for land use and trash generation categories generated through the mapping and assessment process are presented in Table 5.

Table 5: Percentage of jurisdictional area within the City of Menlo Park assigned to each trash generation category.

Trash Generation Category	Jurisdictional Area (Acres)	Commercial and Services	Industrial	Residential	Retail	K-12 Schools	Urban Parks	Other
Very High	0.0	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
High	3.2	0.0%	0.0%	0.0%	100.0%	0.0%	0.0%	0.0%
Medium	291.6	42.4%	14.0%	6.9%	9.8%	23.0%	3.4%	0.4%
Low	4,811.4	10.5%	6.7%	45.8%	1.7%	0.7%	0.6%	33.0%

Figure 5: Trash Generation Map for the City of Menlo Park



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3.0 TRASH MANAGEMENT AREAS AND CONTROL MEASURES

This section describes the control measures that the City of Menlo Park has taken or plans to implement to solve trash/litter problems and achieve a target of 100% trash/litter reduction in the City's stormdrain system by July 1, 2022. The selection of control measures described in this section is based on the City of Menlo Park's current understanding of trash problems within its jurisdiction and the effectiveness of control measures designed to reduce trash impacts associated with stormdrain system discharges.

Information on the costs and effectiveness of some trash control measures is currently lacking and therefore in the absence of this information, the City based its selection of control measures on existing effectiveness information, their experience in implementing trash controls and knowledge of trash problems, and costs of implementation. As knowledge is gained through the implementation of these control measures, the City may choose to refine their trash control strategy described in this section. If significant revisions or amendments are made, a revised Long-Term Plan will be submitted to the Water Board through the Menlo Park's annual reporting process.

3.1 Management Area Delineation and Prioritization

Consistent with the long-term plan framework, the City of Menlo Park delineated and prioritized trash management areas (TMAs) based on the geographical distribution of trash generating areas, types of trash sources, and current or planned control measure locations. TMAs are intended to form the management areas by which trash control measure implementation can be tracked and assessed for progress towards trash reduction targets. Once delineated, TMAs were also prioritized for control measure implementation. The City of Menlo Park's primary management areas were selected based on the spatial distribution of trash generating areas, socioeconomic characteristics, and the location of specific existing or planned management actions within City's jurisdiction.

Menlo Park Methodology to Designate TMAs

As described in the Permittee Characteristics section, Menlo Park's socioeconomic characteristics are vastly different from east to west. The neighborhoods east of Highway 101 in Menlo Park are lower income and experience higher rates of litter than the affluent west side of Menlo Park. In addition, there are more home owner associations in west Menlo Park that keep property and adjacent public facilities (sidewalks and streets) litter free. Thus, TMA designations were separated between east and west Menlo Park as different trash control measures would be employed to address behavior and neighborhood specific activities.

In addition, there were clear differences in community activities in three areas of west Menlo Park. One area includes a bustling downtown with mixed retail and high density housing. Farther west is Menlo Park's venture capital businesses, and heading east near Highway 101, there are small local shops and retail businesses. This created additional TMAs in west Menlo Park in order to effectively manage the trash/litter issues based on neighborhood activity.

Addressing these factors resulted in the creation of four major TMAs for Menlo Park. Subareas were then formed in each TMA to further refine management strategies for residential, retail, park, and school land uses. These activities result in different types of litter behavior and sources, and control

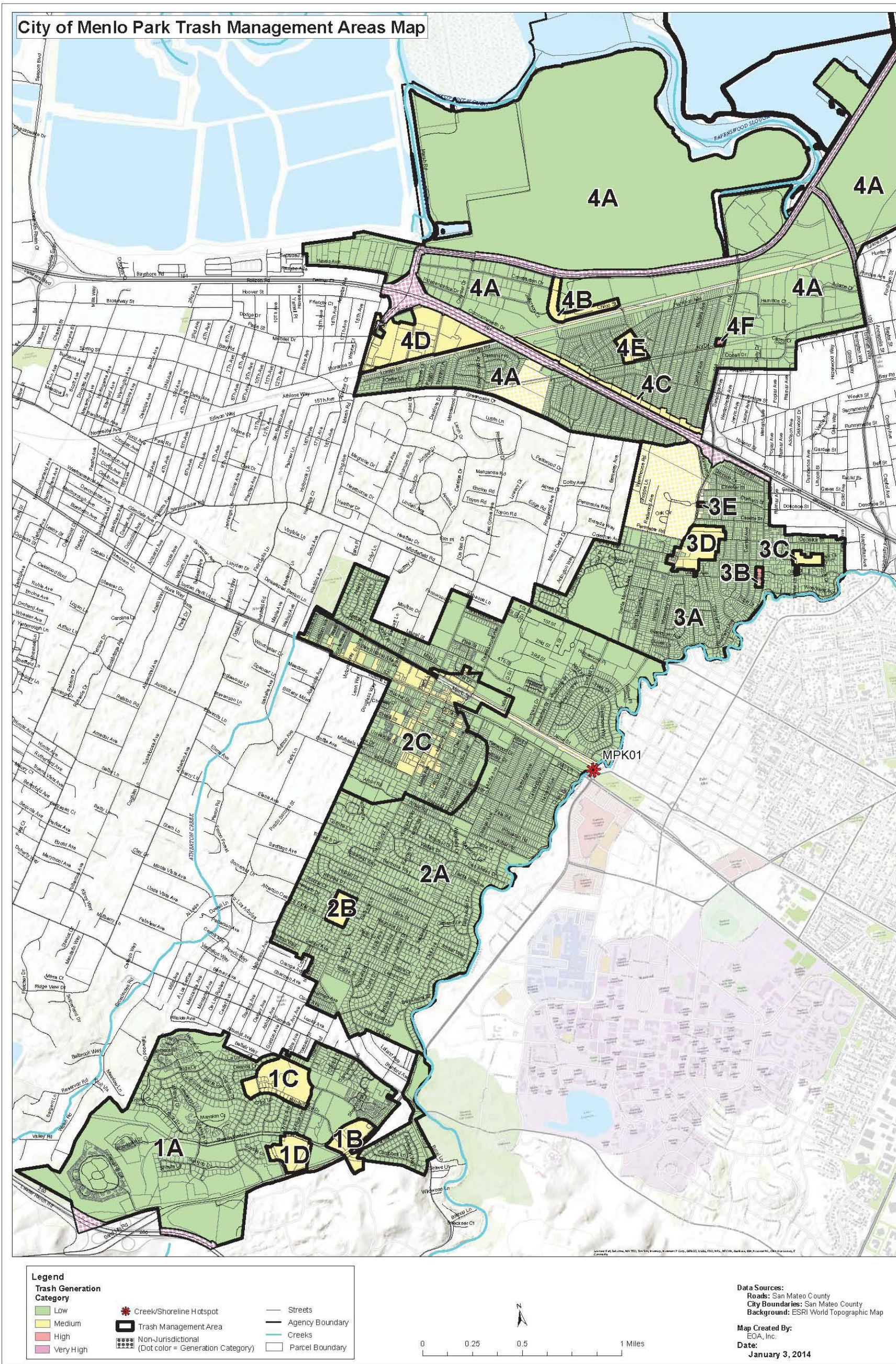
measures would be implemented to address these differences. For example, school youth would require different litter management strategies than large events taking place in parks.

Figure 6 shows a map depicting Menlo Park’s TMAs. All jurisdictional areas within the Menlo Park are included within a TMA. The amount of jurisdictional land area and associated trash condition categories for each TMA are included in Table 6.

Table 6: Jurisdictional area and percentage of each Trash Management Area (TMA) comprised of trash generation categories

TMA	Jurisdictional Area (Acres)	Trash Generation Rate			
		Very High	High	Medium	Low
1A	681.4	0.0%	0.0%	0.0%	100.0%
1B	19.5	0.0%	0.0%	100.0%	0.0%
1C	35.7	0.0%	0.0%	100.0%	0.0%
1D	19.0	0.0%	0.0%	100.0%	0.0%
2A	1,184.0	0.0%	0.0%	0.0%	100.0%
2B	10.3	0.0%	0.0%	100.0%	0.0%
2C	288.9	0.0%	0.0%	22.9%	77.1%
3A	462.5	0.0%	0.0%	0.0%	100.0%
3B	2.2	0.0%	80.7%	19.3%	0.0%
3C	6.1	0.0%	0.0%	100.0%	0.0%
3D	26.7	0.0%	0.0%	86.6%	13.4%
3E	0.4	0.0%	100.0%	0.0%	0.0%
4A	2,257.4	0.0%	0.0%	0.0%	100.0%
4B	14.6	0.0%	0.0%	100.0%	0.0%
4C	14.0	0.0%	0.0%	100.0%	0.0%
4D	72.4	0.0%	0.0%	100.0%	0.0%
4E	10.1	0.0%	0.0%	100.0%	0.0%
4F	1.0	0.0%	100.0%	0.0%	0.0%

Figure 6: Trash Management Area Map for the City of Menlo Park



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3.2 Current and Planned Trash Control Measures

The City of Menlo Park has been taken an active role to control litter prior to the MRP's adoption as Menlo Park's residents and business have a strong community value to be aesthetically pleasing and litter free. In addition, reducing litter ensures that stormwater flow is unobstructed, reducing historical flooding issues that occur in parts of the city during the wet season. The City's focus has been on street sweeping, on-land cleanups, product bans, and education. The city has also installed full trash capture devices, exceeding the requirement in the MRP. In addition, the City is also able to address many other sustainability issues through litter reduction activities, such as waste reduction and increased recycling.

This section describes the current, new, and/or enhanced trash control measures planned for implementation by the City of Menlo Park. The enhanced control measures described are designed to reach a 100% (or no visual impact) litter reduction by July 1, 2022. The City is taking a two pronged approach to eliminating litter through jurisdiction wide policies, such as a plastic bag ban, and specific on-land interception control measures in each trash management area (TMA).

For specific on-land interception control within TMAs, the City has or will implement the following:

- Enhanced Street Sweeping (currently implementing)
- Full Capture Treatment Devices (currently implementing)
- On-land Trash Cleanups (currently implementing and planned expansion)
- Enhanced Stormdrain Inlet Maintenance (currently implementing)
- Improved Trash Bin/Container Management (Municipal or Privately-Controlled) (Currently implementing and planned expansion)
- Property Owner Litter Reduction Compliance Standard Policy/Ordinance (New)
- Enhanced Stormdrain Inlet Maintenance (Currently implementing)
- Anti-littering and Illegal Dumping Enforcement Activities (Currently implementing and planned expansion)
- Activities to Reduce Trash from Uncovered Loads (Currently implementing)
- Commercial Standards to Reduce Litter (Currently implementing and planned expansion)

For trash/litter prevention, the City has or will implement the following:

- Single-use Carryout Bag Reduction Ordinance (currently implementing and planned expansion)
- Polystyrene Food Service Ware Ordinance (currently implementing and planned expansion)
- Public Education and Outreach Programs (currently implementing and planned expansion)

The sections below describe specific control measures implemented in each TMA. The last section describes jurisdiction wide control measures that further reduce litter in each TMA.

Trash Management Area No. 1 (West Menlo Park)

Trash Management Area (TMA) No.1 (West Menlo Park) includes the city's venture capital businesses and major research and development firms, such as SLAC National Accelerator Laboratory. In addition, the area includes many home owners associations and high income households. There are four subareas in this TMA:

- Subarea 1A is comprised of high income residential homes and condos, and includes the Sharon Heights Golf and Country Club. The average home price in Menlo Park is just under \$1.1 million (Menlo Park Housing Element). Due to the socioeconomic characteristics of this area and site observations, there is little to no litter observed. Litter that is attributed the area is likely from trash collection trucks emptying garbage and recycling carts, and the city's street sweeping program is sufficient to capture this litter as it is scheduled to occur the day after a garbage collection event. This area is designated as a low trash generating area.
- Subarea 1B is a shopping center that includes a Safeway grocery store, bank, CVS drug store, Starbucks coffee shop, and dry cleaner. Litter found in this area results from parked cars and pedestrian activities occurring within the shopping center, and is considered a medium trash generating area.
- Subarea 1C includes La Entrada Middle School and Phillips Brooks private school. The schools are adjacent to each other, and litter in this area is a result of activities occurring on the school campuses that may blow into the public right of way and also pedestrian traffic. This area is designated as a medium trash generating area.
- Subarea 1D is a large private business park with an onsite café. Litter in this area is a result of conferences, business, and restaurant activities occurring onsite, and is designated as a medium trash generating area.

Street Sweeping Program

Actions initiated prior to and continued after the MRP effective date: The City of Menlo Park's street sweeping schedule is and will continue to be as follows for the entire TMA No. 1:

- January through February (wet season)- streets are swept every week
- March through April (dry season with wet periods)- streets are swept every other week
- May through September (dry season) - streets are swept once per month.
- October (dry Season with wet periods)- streets are swept every other week
- November through December (wet Season)-streets are swept every week

Parking enforcement signs for street sweeping are not posted in the City, but "No Overnight Parking" enforcement equivalent occurs in areas 1B, 1C, and 1D, which allows additional litter to be picked up by the early morning street sweeping schedule.

City staff analyzed street sweeping records during the non-leaf dropping season (May through September) between 2010 and 2012 to estimate how much litter is picked up annually by the street sweeping program. For TMA No.1 and associated subareas, an estimated 48 cubic yards per year is collected.

Actions planned for future implementation: The City may explore more frequent street sweeping of areas 1B and 1C if other control measures for these areas are not effective by July 1, 2020.

Property Owner Litter Reduction Compliance Standards

Actions planned for future implementation: Due to rising operational costs to abate litter in the storm drain system, the City will develop and implement litter reduction compliance standards on large properties that are identified as generating medium to high litter levels. This would reduce

operational costs for the city and place responsibility on property owners, which would likely motivate property owners to find creative solutions to reduce the source of trash/litter onsite. Areas 1B, 1C, and 1D would meet this threshold for compliance, and would be required to implement a menu of trash management measures to reduce litter from their property, such as installing and maintaining full capture devices, carrying out regular on-land cleanups, regularly cleaning out city stormdrains, and/or improved trash bin management practices. The standard would be incorporated into new development standards and for existing developments would be enforced through adoption of an ordinance. Financial penalties would be assessed for noncompliance at a rate to produce expedited compliance. The details of the standard will be developed over the next two years with an effective date of July 1, 2017.

This policy would require extensive community engagement and public input, which is planned over the next two years. In the event that the City is unable to implement a property owner litter reduction compliance standard by July 1, 2017, the City will evaluate the next most cost effective trash management measure(s) to implement in areas 1B, 1C, and 1D. Options include installation of full trash capture devices, increased street sweeping frequency, and improved trash bin management.

Full Capture Treatment Devices

As defined by the Municipal Regional Stormwater Permit (MRP), a full-capture system or device is 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.

Actions initiated after the MRP effective date: Area 1D that is comprised of a large business park includes a CDS full capture treatment device. An operations and maintenance agreement was executed in 2012 for the device, and city staff inspects the full capture unit every five years as part of the C.3 MRP requirements. In addition, the property owner submits an annual report to the City in January demonstrating that the device is well maintained and operated. See Figure 7 for land area coverage of litter abatement.

Actions planned for future implementation: The City may explore installing additional trash capture devices in areas 1B and 1C if other trash management measures, such as the property owner litter reduction compliance standards, for these areas are not effective by July 1, 2020.

Improved Trash Bin/Container Management

Receptacles used to place/store trash or recyclables prior to collection by a public agency or private waste hauler reduce the potential for littering and trash loading to stormwater conveyance systems and receiving waters. Receptacles fall into the following two categories:

- **Private Trash/Recycling Bins:** A receptacle for placing trash or recyclables generated from a household, business, or other location that is serviced by a garbage hauler. Bins are specifically-designed, heavy-duty plastic wheeled containers with hinged lids; or large multi-yard metal or plastic containers rectangular in shape.
- **Public Area Trash Containers:** A receptacle for placing incidental trash generated in public spaces that provides people with a convenient and appropriate place to dispose of trash. The design and size of public area trash containers vary widely, depending on their setting and use.

The effectiveness of bins/containers in reducing trash in the environment is dependent upon the location and density of the receptacles, size of the bin/container in relationship to the size needed to service users, frequency of maintenance, and the ability of the bin/container to capture and contain the trash deposited.

Actions initiated prior to and continued after the MRP effective date: The City requires adequate sizing and covers of private garbage and recycling bins per section 7.04.030 of the City Garbage and Rubbish Disposal Ordinance. The ordinance is enforced on a compliant basis or when notified by other city staff members or the city's waste hauler. In addition, the city's contract with the waste hauler requires an overage charge for overflowing bins to motivate customers to adequately size bins/containers.

There are 32 public garbage and recycling containers in TMA No.1 to capture trash from pedestrians and other outdoor activities. There are 21 containers are in subarea 1A, ten in 1B, and one in 1C. Containers in TMA No. 1 are serviced Mondays, Wednesdays, and Fridays with exception of Sharon Park that is emptied on Thursdays.

Actions initiated after the MRP effective date: The City has developed a strategic plan for public area garbage containers to reduce public litter. The plan is attached in Appendix A, and is used to:

- Identify whether public area trash containers are sufficiently located in high trash generating areas and are adequately designed to manage trash types that typically are generated from activities occurring at these areas (e.g. containers with larger openings designed to accommodate larger trash items like pizza boxes are in locations where people dispose of these items, such as parks).
- Identify where increased level of inspection and maintenance of public area trash containers is needed at high trash generating sites.
- Include installation of specialty trash bins/containers (e.g. bins for cigarette ends, sharps, etc.) in specific locations to eliminate or reduce the prevalence of these items in stormwater convenience systems.
- Include the installation of new technologies (e.g. Big Belly Solar Trash Compactors) to reduce trash in stormwater and reduce the cost of adding public area trash containers.

The city's Environmental Program staff, Maintenance staff, and contracted consultants, Cascadia Consulting Group, Inc., worked collaboratively to identify problem sites and potential recommendations. Cascadia Consulting Group surveyed over 330 city-owned and operated public garbage containers for effectiveness of litter capture based on size, location, maintenance schedule, and waste composition. The strategic plan included recommendations to improve litter capture and associated cost with any improvement to the existing public container management program. The City will begin implementing the plan starting July 1, 2014, and has earmarked \$65,000 in the Capital Improvement Plan to accomplish this task.

Actions planned for future implementation: For private bin management, annually distribute information about the City's Garbage and Rubbish Disposal Ordinance and potential litter issues as a result of noncompliance to all residential, commercial, and industrial businesses through a solid waste billing insert.

For public area trash container management in subarea 1A at Sharon Park, the city will implement the following recommendations from the strategic plan:

- Relocate limited use of a standalone garbage container opposite of the playground to the interior of the park on the west side of the pond, and pair with a recycling container.
- Relocate one limited use of a standalone garbage container at the corner of the park to another problem site, such as 720 Menlo Avenue or 564 Oak Grove Avenue.
- Implement specialty bin and new technologies, such as installing new eye catching receptacles, cigarette receptacles, and CRV collection containers.

For subareas 1B and 1C, some containers need new lids to prevent garbage from escaping. In addition, improved signage and installation of specialty bins will also be implemented to increase visibility and promote appropriate disposal behavior. See Appendix A for more details.

Product Bans- Refer to Jurisdiction Wide Control Measures.

Public Awareness and Outreach- Refer to Jurisdiction Wide Control Measures.

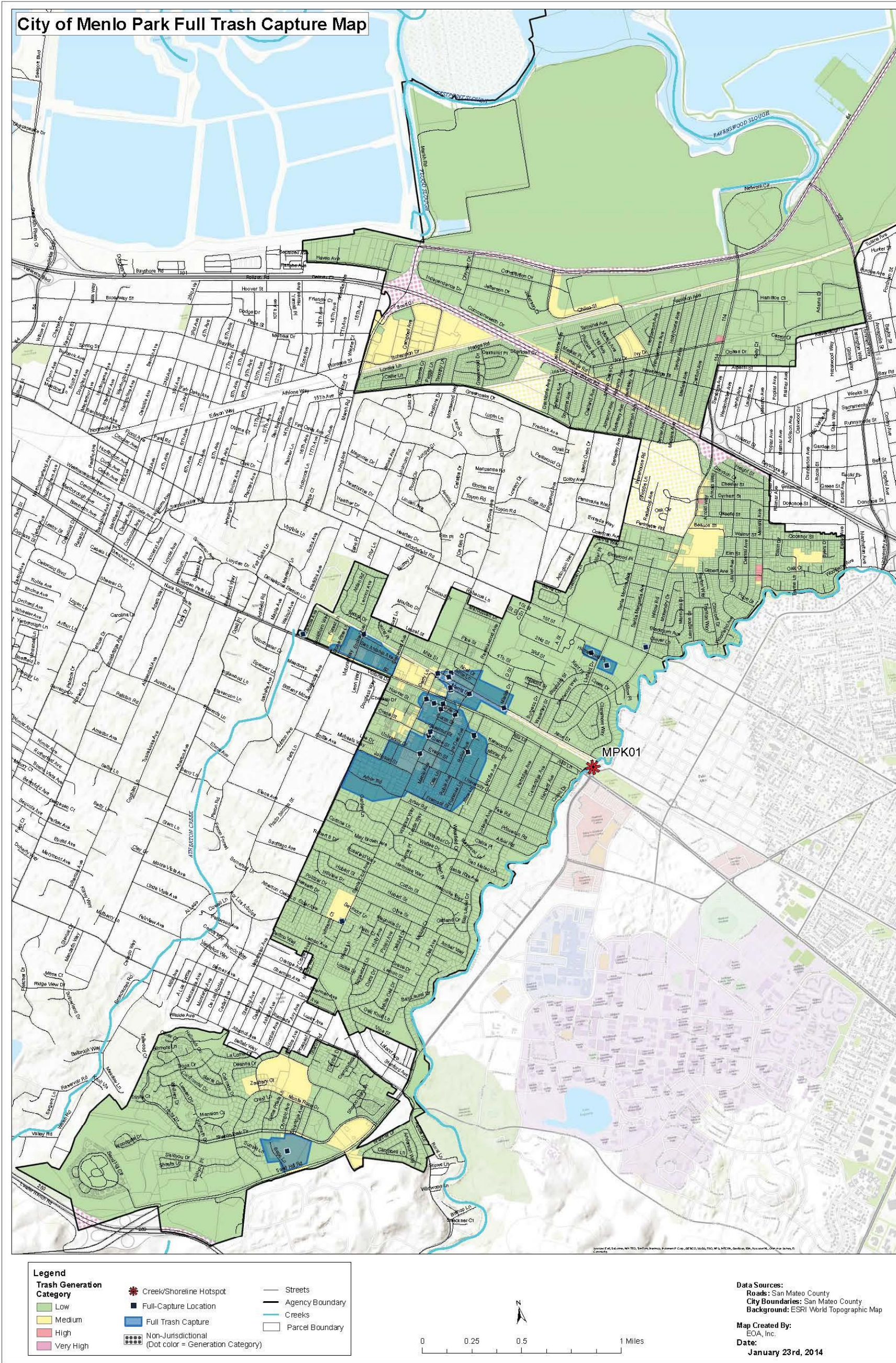
Enhanced Stormdrain Inlet Maintenance- Refer to Jurisdiction Wide Control Measures.

Anti-littering and Illegal Dumping Enforcement Activities- Refer to Jurisdiction Wide Control Measures.

Activities to Reduce Trash from Uncovered Loads- Refer to Jurisdiction Wide Control Measures.

Commercial Standards to Reduce Litter- Refer to Jurisdiction Wide Control Measures.

Figure 7: Full Trash Capture Map for the City of Menlo Park



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Trash Management Area No. 2 (Downtown Menlo Park)

Trash Management Area (TMA) No. 2 includes the City's lively downtown area surrounded by high density housing, Caltrain station, offices, restaurants, post office, and retail activities. East of the downtown area is the civic center campus, SRI international, the U.S. Geological Survey, and Menlo Atherton High School. The area also includes many single family homes that are quiet with a suburban-like atmosphere. The TMA is divided into three subareas:

- Subarea 2A is mainly single family homes with high income and highly educated residents. The average home price in Menlo Park is just under \$1.1 million (Menlo Park Housing Element). Due to the socioeconomic characteristics of this area and site observations, there is little to no litter observed. Litter that is attributed the area is likely from trash collection trucks emptying garbage and recycling carts, and the city's street sweeping program is sufficient to capture this litter as it is scheduled a day after a garbage collection event. This area is designated as a low trash generating area.
- Subarea 2B is Hillview Middle School located at the end of Santa Cruz. Litter in this area tends to be candy and snack wrappers, and lunch related items. This area is designated as a medium trash generating area.
- Subarea 2C is downtown Menlo Park with a mix of shops, restaurants, coffee shops, retail, banks, office space, grocery stores, train station, and public parking lots. Litter in this area results from pedestrian traffic and eating outdoors. Also, overflowing public trash bins and commercial garbage and recycling containers contribute to the litter found in downtown. This area is designated as a medium trash generating area.

Street Sweeping Program

Actions initiated prior to and continued after the MRP effective date: The City of Menlo Park's street sweeping schedule is and will continue to be as follows for subarea 2A, 2B and low trash generating areas of 2C:

- January through February (wet season)- streets are swept every week
- March through April (dry season with wet periods)- streets are swept every other week
- May through September (dry season) - streets are swept once per month.
- October (dry Season with wet periods)- streets are swept every other week
- November through December (wet Season)-streets are swept every week

For area 2C (downtown) that is designated as a medium trash generating, the frequency of street sweeping is significantly increased to twice per week all year long. The area east of the downtown that consists of the city's civic center, Caltrain station, SRI International, the U.S. Geological Survey, and Menlo Atherton High school is also swept once every week year round.

Parking enforcement signs for street sweeping are not posted in the City, but "No Overnight Parking" enforcement equivalent occurs in area 2C (downtown), which allows additional litter to be picked up by the early morning street sweeping schedule.

City staff analyzed street sweeping records during the non-leaf dropping season (May through September) between 2010 and 2012 to estimate how much potential litter is picked up annually by the street sweeping program. For subarea 2A, 2B, and low trash generating segments of 2C, the average annual litter/debris collected annually is 334 cubic yards. For area 2C (downtown) that is

designated as a medium trash generating, the average litter collected annually is 175 cubic yards. In addition, the City also sweeps public parking plazas twice per week year round, and the average litter collected annually is 80 cubic yards.

Property Owner Litter Reduction Compliance Standards

Actions planned for future implementation: Due to rising operational costs to abate litter in the storm drain system, the City will develop and implement litter reduction compliance standards on large properties that are identified as generating medium to high trash. This would reduce operational costs for the city and place responsibility on property owners, which would likely motivate property owners to find creative solutions to reduce the source of trash/litter onsite. Areas 2B and some areas of 2C would meet this threshold for compliance, and would be required to implement a menu of trash management measures to reduce litter from their property, such as installing and maintaining full capture devices, carrying out regular on-land cleanups, regularly cleaning out city stormdrains, and/or improved trash bin management practices. The standard would be incorporated into new development standards and for existing developments, would be enforced through adoption of an ordinance. Financial penalties would be assessed for noncompliance at a rate to produce expedited compliance. The details of the standard will be developed over the next two years with an effective date of July 1, 2017.

This policy would require extensive community engagement and public input, which is planned over the next two years. In the event that the City is unable to implement a property owner litter reduction compliance standard by July 1, 2017, the City will evaluate the next most cost effective trash management measure(s) to implement in areas 2B and 2C. Options include installation of full trash capture devices, increased street sweeping frequency, and improved trash bin management.

Full Capture Treatment Devices

As defined by the Municipal Regional Stormwater Permit (MRP), a full-capture system or device is 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.

Actions initiated after the MRP effective date: Subarea 2C (downtown) has 20 *trashguard* full capture treatment devices. See Figure 7 for trash capture locations and coverage area. City staff operate and maintain these devices. They are inspected and cleaned after every rain and before the wet season begins in October. Every maintenance/service activity is documented using the “Trash Capture Device Maintenance Report” inspection form provided by the Bay Area-Wide Trash Capture Demonstration Project. After the forms are completed, staff enters the information into the www.bayareatrashtacker.org website. To date, there have been no maintenance or performance issues.

Subarea 2B, which is a middle school, has a CDS trash capture device. In addition, two commercial properties in subarea 2A have a CDS and Contech Filter Unit trash capture devices (1906 El Camino Real and 100 Middlefield Road-NW corner), and two high density housing developments also have CDS trash captures device installed (161 Linfield Drive and 301 Homewood Place). See Figure 7 for trash capture locations and litter coverage area. An operations and maintenance agreement was executed for these privately managed devices, and city staff inspects the full capture units every five years as part of the C.3 MRP requirements. In addition, the property owner submits an annual report to the City in January demonstrating that the device is well maintained and operated.

Actions planned for future implementation: If other trash management measures are not effective by July 1, 2020, the city may explore installing additional trash capture devices in medium trash generating areas of subarea 2C where there is currently no trash capture coverage.

Improved Trash Bin/Container Management

Receptacles used to place/store trash or recyclables prior to collection by a public agency or private waste hauler reduce the potential for littering and trash loading to stormwater conveyance systems and receiving waters. Receptacles fall into the following two categories:

- **Private Trash/Recycling Bins:** A receptacle for placing trash or recyclables generated from a household, business, or other location that is serviced by a garbage hauler. Bins are specifically-designed, heavy-duty plastic wheeled containers with hinged lids; or large multi-yard metal or plastic containers rectangular in shape.
- **Public Area Trash Containers:** A receptacle for placing incidental trash generated in public spaces that provides people with a convenient and appropriate place to dispose of trash. The design and size of public area trash containers vary widely, depending on their setting and use.

The effectiveness of bins/containers in reducing trash in the environment is dependent upon the location and density of the receptacles, size of the bin/container in relationship to the size needed to service users, frequency of maintenance, and the ability of the bin/container to capture and contain the trash deposited.

Actions initiated prior to and continued after the MRP effective date: The City requires adequate sizing and covers of private garbage and recycling bins per section 7.04.030 of the City's Garbage and Rubbish Disposal Ordinance. The ordinance is enforced on a compliant basis or when notified by other city staff members or the city's waste hauler. If a violation occurs, a notice is sent to the customer to increase container or bin size. In addition, the City's contract with the waste hauler requires an overage charge for overflowing bins to motivate customers to adequately size bins/containers.

There are 197 public garbage and recycling containers in TMA No.2 to capture trash from pedestrians and other outdoor activities. There are 80 containers in subarea 2A, two in 2B, and 115 in 2C. The downtown containers in subarea 2C are serviced every day. All other containers are serviced Monday, Wednesdays, and Thursdays, or more frequently if needed.

Actions initiated after the MRP effective date: The City has developed a strategic plan for public area garbage containers to reduce public litter. The plan is attached in Appendix A, and is used to:

- Identify whether public area trash containers are sufficiently located in high trash generating areas and are adequately designed to manage trash types that typically are generated from activities occurring at these areas (e.g. containers with larger openings designed to accommodate larger trash items like pizza boxes are in locations where people dispose of these items, such as parks).
- Identify where increased level of inspection and maintenance of public area trash containers is needed at high trash generating sites.

- Include installation of specialty trash bins/containers (e.g. bins for cigarette ends, sharps, etc.) in specific locations to eliminate or reduce the prevalence of these items in stormwater convenience systems.
- Include the installation of new technologies (e.g. Big Belly Solar Trash Compactors) to reduce trash in stormwater and reduce the cost of adding public area trash containers.

The city's Environmental Program staff, Maintenance staff, and contracted consultants, Cascadia Consulting Group, Inc., worked collaboratively to identify problem sites and potential recommendations. Cascadia Consulting Group surveyed over 330 city-owned and operated public garbage containers for effectiveness of litter capture based on size, location, maintenance schedule, and waste composition. The strategic plan included recommendations to improve litter capture and associated cost with any improvement to the existing public bin management program. The city will begin implementing the plan starting July 1, 2014, and has earmarked \$65,000 in the Capital Improvement Plan to accomplish this task.

For subarea 2C, the City has already implemented some of the recommendations made in the plan, and include the following:

Plan Recommendation	City Action in FY 13-14
Weekly monitoring of 44 containers, or consider increasing sizes or service frequency.	The City exceeded the plan's requirements by replacing the 44 containers with 62 new containers, and upgraded the size from 20 gallon containers to 32 gallon containers
Repaired damaged containers and improved signage to promote appropriate disposal behaviors and to prevent garbage from escaping containers.	Damaged containers were replaced, and the new containers have secure lids.
Install additional garbage and recycling containers identified in the plan.	18 new containers were installed.
Implement specialty bin and new technologies, such as installing new eye catching receptacles, cigarette receptacles, and CRV collection containers.	The new containers are more noticeable and are brightly colored.

Actions planned for future implementation: For private bin management, annually distribute information about the City's Garbage and Rubbish Disposal Ordinance and potential litter issues as a result of noncompliance to all residential, commercial, and industrial businesses through a solid waste billing insert.

For public area trash container management in subarea 2A:

- At 333 Ravenswood Avenue, move one garbage container closer to the sidewalk and parking lot entrance for easy pedestrian access and pair with a recycling container.
- Weekly monitoring for one container at El Camino Real at Creek Drive due to consistent overflows and illegal dumping, or consider increasing size or service frequency.
- Repair damaged lids in the area to prevent garbage from escaping.
- Improve signage to increase visibility and promote appropriate disposal behavior.

- Implement specialty bin and new technologies, such as installing new eye catching receptacles, cigarette receptacles, and CRV collection containers.

For subarea 2C (Downtown):

- Relocate three containers with little to no use to other problem areas.
- Work with Caltrans to increase the size of a container and pair with a recycling container next to the bike locker area (Ravenswood Avenue).
- Coordinate regular litter cleanups with transit agencies and city's waste hauler, such as Caltrain and Recology.
- Increase recycling informational signage so users can easily identify what material is accepted in the recycling stream.

On-Land Trash Cleanup

Actions planned for future implementation: The City plans to revise its encroachment permit language for restaurants with sidewalk tables and chairs or other retail sidewalk activities to clarify and enforce cleanliness requirements to keep areas litter free.

Product Bans- Refer to Jurisdiction Wide Control Measures.

Public Awareness and Outreach- Refer to Jurisdiction Wide Control Measures.

Enhanced Stormdrain Inlet Maintenance- Refer to Jurisdiction Wide Control Measures.

Anti-littering and Illegal Dumping Enforcement Activities- Refer to Jurisdiction Wide Control Measures.

Activities to Reduce Trash from Uncovered Loads- Refer to Jurisdiction Wide Control Measures.

Commercial Standards to Reduce Litter- Refer to Jurisdiction Wide Control Measures.

Trash Management Area No. 3 (Between Highway 101 and El Camino Real)

Trash Management Area No. 3 is located between Highway 101 and El Camino Real, and includes single family homes and some local retail and restaurant pocket areas. There are five subareas in this TMA:

- Subarea 3A is comprised of high income residential homes. Due to the socioeconomic characteristics of this area and site observations, there is little to no litter observed. Litter that is attributed to the area likely comes from trash collection trucks emptying garbage and recycling carts and the city's street sweeping program is sufficient to capture this litter as the event occurs a day after garbage and recycling collection day. This area has been designated as a low trash generating area.
- Subarea 3B is a small shopping strip of mixed retail, dry cleaner, café, bakery, and grocery store. This area experiences litter from the activities occurring in the shopping strip. Public container/bins frequently overflow with trash, and birds pick out contents from these containers, which leads to further litter issues at this site. In addition, the small grocery

store parking lot had a mix of food wrappers and cigarette butts present. This area has been designated as a high trash generating area.

- Subarea 3C is a couple streets away from subarea 3B and was a private school that is now closed. Small articles of litter are found here, and is likely from student and pedestrian traffic coming from the shopping strip in subarea 3B. This area has been designated as a medium trash generating area.
- Subarea 3D is Willow Oaks Elementary School and Menlo Oaks School, and is a couple of blocks from retail activities and a gas station. Litter found in this area is a result of pedestrian traffic. This area has been designated as a medium trash generating area.
- Subarea 3E is another small shopping strip with a donut shop and other retail businesses, and litter at this site is associated with retail and bakery activities. This site has been designated as a high trash generating site.

Street Sweeping Program

Actions initiated prior to and continued after the MRP effective date: The City of Menlo Park's street sweeping schedule is and will continue to be as follows for the entire TMA No.3:

- January through February (wet season)- streets are swept every week
- March through April (dry season with wet periods)- streets are swept every other week
- May through September (dry season) - streets are swept once per month.
- October (dry Season with wet periods)- streets are swept every other week
- November through December (wet Season)-streets are swept every week

Parking enforcement signs for street sweeping are not posted in the City, but “No Overnight Parking” enforcement equivalent occurs in area 3D and 3E, which allows additional litter to be picked up by the early morning street sweeping schedule.

City staff analyzed street sweeping records during the non-leaf dropping season (May through September) between 2010 and 2012 to estimate how much potential litter is picked up annually by the street sweeping program. For the entire TMA, including subareas, the street sweeping program collects an estimated 109 cubic yards annually.

Property Owner Litter Reduction Compliance Standards

Actions planned for future implementation: Due to rising operational costs to abate litter in the storm drain system, the City will develop and implement litter reduction compliance standards on large properties that are identified as generating medium to high trash. This would reduce operational costs for the city and place responsibility on property owners, which would likely motivate property owners to find creative solutions to reduce the source of trash/litter onsite. Areas 3B, 3C, 3D, and 3E would meet this threshold for compliance, and would be required to implement a menu of trash management measures to reduce litter from their property, such as installing and maintaining full capture devices, carrying out regular on-land cleanups, regularly cleaning out city stormdrains, and/or improved trash bin management practices. The standard would be incorporated into new development standards and for existing developments, would be enforced through adoption of an ordinance. Financial penalties would be assessed for noncompliance at a rate to produce expedited compliance. The details of the standard will be developed over the next two years with an effective date of July 1, 2017.

This policy would require extensive community engagement and public input, which is planned over the next two years. In the event that the City is unable to implement a property owner litter reduction compliance standard by July 1, 2017, the City will evaluate the next most cost effective trash management measure(s) to implement in areas 3B, 3C, 3D, and 3E. Options include installation of full trash capture devices, increased street sweeping frequency, and improved trash bin management.

Full Capture Treatment Devices

As defined by the Municipal Regional Stormwater Permit (MRP), a full-capture system or device is 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.

Actions planned for future implementation: The City may explore installing additional trash capture devices in subareas 3B, 3C, 3D, and 3E if other trash management measures, such as the property owner litter reduction compliance standards, for these areas are not effective by July 1, 2020.

Improved Trash Bin/Container Management

Receptacles used to place/store trash or recyclables prior to collection by a public agency or private waste hauler reduce the potential for littering and trash loading to stormwater conveyance systems and receiving waters. Receptacles fall into the following two categories:

- **Private Trash/Recycling Bins:** A receptacle for placing trash or recyclables generated from a household, business, or other location that is serviced by a garbage hauler. Bins are specifically-designed, heavy-duty plastic wheeled containers with hinged lids; or large multi-yard metal or plastic containers rectangular in shape.
- **Public Area Trash Containers:** A receptacle for placing incidental trash generated in public spaces that provides people with a convenient and appropriate place to dispose of trash. The design and size of public area trash containers vary widely, depending on their setting and use.

The effectiveness of bins/containers in reducing trash in the environment is dependent upon the location and density of the receptacles, size of the bin/container in relationship to the size needed to service users, frequency of maintenance, and the ability of the bin/container to capture and contain the trash deposited.

Actions initiated prior to and continued after the MRP effective date: The City requires adequate sizing and covers of private garbage and recycling bins per section 7.04.030 of the City's Garbage and Rubbish Disposal Ordinance. The ordinance is enforced on a compliant basis or when notified by other city staff members or the city's waste hauler. If a violation occurs, a notice is sent to the customer to increase container or bin size. In addition, the City's contract with the waste hauler requires an overage charge for overflowing bins to motivate customers to adequately size bins/containers.

There are 41 public garbage and recycling containers in TMA No.3 to capture trash from pedestrians and other outdoor activities. There are 23 containers in subarea 3A, three in 3B, and fifteen in 3D. The containers in TMA No. 3 are generally serviced Mondays, Wednesdays, and Fridays by City staff or the City's waste hauler.

Actions initiated after the MRP effective date: The City has developed a strategic plan for public area garbage containers to reduce public litter. The plan is attached in Appendix A, and is used to:

- Identify whether public area trash containers are sufficiently located in high trash generating areas and are adequately designed to manage trash types that typically are generated from activities occurring at these areas (e.g. containers with larger openings designed to accommodate larger trash items like pizza boxes are in locations where people dispose of these items, such as parks).
- Identify where increased level of inspection and maintenance of public area trash containers is needed at high trash generating sites.
- Include installation of specialty trash bins/containers (e.g. bins for cigarette ends, sharps, etc.) in specific locations to eliminate or reduce the prevalence of these items in stormwater convenience systems.
- Include the installation of new technologies (e.g. Big Belly Solar Trash Compactors) to reduce trash in stormwater and reduce the cost of adding public area trash containers.

The city's Environmental Program staff, Maintenance staff, and contracted consultants, Cascadia Consulting Group, Inc., worked collaboratively to identify problem sites and potential recommendations. Cascadia Consulting Group surveyed over 330 city-owned and operated public garbage containers for effectiveness of litter capture based on size, location, maintenance schedule, and waste composition. The strategic plan included recommendations to improve litter capture and associated cost with any improvement to the existing public bin management program. The city will begin implementing the plan starting July 1, 2014, and has earmarked \$65,000 in the Capital Improvement Plan to accomplish this task.

Actions planned for future implementation: For private bin management, annually distribute information about the City's Garbage and Rubbish Disposal Ordinance and potential litter issues as a result of noncompliance to all residential, commercial, and industrial businesses through a solid waste billing insert.

For public area trash container management in subarea 3A:

- Weekly monitoring of four containers at 812, 850, and 900 Willow Road due to overflow and high litter levels, especially in business parking lots. An alternative would be to increase container size or use a compactor.
- Repair damaged containers to prevent garbage from escaping.
- Improve signage to increase visibility and promote proper disposal behavior.

For subarea 3B:

- Relocate one container that has little to no use to another problem area.
- Repair and consider increasing the size of three containers between 1919-1933 Menalto Avenue. They are currently missing lids.

For subarea 3D:

- Relocate two containers because they are not easily visible from behind a bus enclosure.
- Weekly monitoring of two containers at 491 Willow Road due to bus stop with consistent overflow and high litter levels or consider increasing the size or using a trash compactor technology.

- Repair damaged lids to prevent litter from escaping.
- Implement specialty bins and consider new technologies to promote proper disposal behavior.

Product Bans- Refer to Jurisdiction Wide Control Measures.

Public Awareness and Outreach- Refer to Jurisdiction Wide Control Measures.

Enhanced Stormdrain Inlet Maintenance- Refer to Jurisdiction Wide Control Measures.

Anti-littering and Illegal Dumping Enforcement Activities- Refer to Jurisdiction Wide Control Measures.

Activities to Reduce Trash from Uncovered Loads- Refer to Jurisdiction Wide Control Measures.

Commercial Standards to Reduce Litter- Refer to Jurisdiction Wide Control Measures

Trash Management Area No. 4 (East Menlo Park)

Trash Management Area No. 4 is located on the east side of Menlo Park and includes single family housing, high density housing, and large industrial and commercial facilities, such as Tyco Electronics and Facebook, Inc. There are six subareas in this TMA:

- Subarea 4A is comprised of residential homes. Compared to the west side of Menlo Park, the socioeconomic makeup of this area is primarily low income households. After consulting with residents that live in this neighborhood, city maintenance staff, and conducting site observations, it was determined that the area is low trash generating. Litter that is attributed to the area is effectively removed through the city's street sweeping program.
- Subarea 4B is a stretch of local road (Chilco) that continually experiences illegal dumping issues from large pieces of furniture and appliances to bags of garbage. Most if not all the litter is captured along the fence line of this area, and there are no stormdrains within the vicinity, which limits litter from entering the stormdrain system. The frequency of illegal dumping occurs at least once a month. Litter that has escaped trash bags is picked up through the city's street sweeping program. This area has been designated as a medium trash generating area.
- Subarea 4C is another stretch of road (Pierce) with high density residential on one side and a fence line along Highway 101. Small articles of trash have been observed at this location as well as illegal dumping activities similar in scope to subarea 4B. The fence line has vegetation in front of it, which prevents trash from blowing or flowing into stormdrains. This area has been designated as a medium trash generation area.
- Subarea 4D consists of industrial parks, offices, post office, Nevro Corporation, Tau Tana Group Research, and Abbot Vascular Inc. Vehicles and delivery trucks pass through frequently. Some offices complexes have a café within the building. Small articles of litter were found along curbs. This area has been designated as a medium trash generating area.
- Subarea 4E consists of the Belle Haven Elementary School surrounded by residential neighborhoods. The area experiences lots of passing cars and parked cars. The area also has

three bus stops and down the road is La Michoacana Market Taqueria. Small articles of litter, such as paper receipts, candy wrappers, single use beverage containers, lids, and straws are found closer to the school grounds and the market. However, the residential areas around the school have little to no litter. This area is designated as a medium trash generating area.

- Subarea 4F consists of La Michoacana Market and Taqueria, and is adjacent to a very busy intersection. Single use beverage containers are found along the side of the road. Paper litter and small articles of litter are found in the dirt near the store entrance and in the parking lot area.

Street Sweeping Program

Actions initiated prior to and continued after the MRP effective date: The City of Menlo Park's street sweeping schedule is and will continue to be as follows for the entire TMA No.4:

- January through February (wet season)- streets are swept every week
- March through April (dry season with wet periods)- streets are swept every other week
- May through September (dry season) - streets are swept once per month.
- October (dry Season with wet periods)- streets are swept every other week
- November through December (wet Season)-streets are swept every week

Parking enforcement signs for street sweeping are not posted in the City, but “No Overnight Parking” enforcement equivalent occurs in area 4B, 4D, and 4F, which allows additional litter to be picked up by the early morning street sweeping schedule.

City staff analyzed street sweeping records during the non-leaf dropping season (May through September) between 2010 and 2012 to estimate how much potential litter is picked up annually by the street sweeping program. For the entire TMA, including subareas, the street sweeping program collects an estimated 223 cubic yards annually.

Property Owner Litter Reduction Compliance Standards

Actions planned for future implementation: Due to rising operational costs to abate litter in the storm drain system, the City will develop and implement litter reduction compliance standards on large properties that are identified as generating medium to high trash. This would reduce operational costs for the city and place responsibility on property owners, which would likely motivate property owners to find creative solutions to reduce the source of trash/litter onsite. Areas 4D, 4E, and 4F would meet this threshold for compliance, and would be required to implement a menu of trash management measures to reduce litter from their property, such as installing and maintaining full capture devices, carrying out regular on-land cleanups, regularly cleaning out city stormdrains, and/or improved trash bin management practices. The standard would be incorporated into new development standards and for existing developments, would be enforced through adoption of an ordinance. Financial penalties would be assessed for noncompliance at a rate to produce expedited compliance. The details of the standard will be developed over the next two years with an effective date of July 1, 2017.

This policy would require extensive community engagement and public input, which is planned over the next two years. In the event that the City is unable to implement a property owner litter reduction compliance standard by July 1, 2017, the City will evaluate the next most cost effective trash management measure(s) to implement in areas 4D, 4E, and 4F. Options include installation of

full trash capture devices, increased street sweeping frequency, and improved trash bin management.

Full Capture Treatment Devices

As defined by the Municipal Regional Stormwater Permit (MRP), a full-capture system or device is 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.

Actions planned for future implementation: The City may explore installing additional trash capture devices in subareas 4B, 4C, 4D, 4E, and 4F if other trash management measures for these areas are not effective by July 1, 2020.

Improved Trash Bin/Container Management

Receptacles used to place/store trash or recyclables prior to collection by a public agency or private waste hauler reduce the potential for littering and trash loading to stormwater conveyance systems and receiving waters. Receptacles fall into the following two categories:

- **Private Trash/Recycling Bins:** A receptacle for placing trash or recyclables generated from a household, business, or other location that is serviced by a garbage hauler. Bins are specifically-designed, heavy-duty plastic wheeled containers with hinged lids; or large multi-yard metal or plastic containers rectangular in shape.
- **Public Area Trash Containers:** A receptacle for placing incidental trash generated in public spaces that provides people with a convenient and appropriate place to dispose of trash. The design and size of public area trash containers vary widely, depending on their setting and use.

The effectiveness of bins/containers in reducing trash in the environment is dependent upon the location and density of the receptacles, size of the bin/container in relationship to the size needed to service users, frequency of maintenance, and the ability of the bin/container to capture and contain the trash deposited.

Actions initiated prior to and continued after the MRP effective date: The City requires adequate sizing and covers of private garbage and recycling bins per section 7.04.030 of the City's Garbage and Rubbish Disposal Ordinance. The ordinance is enforced on a compliant basis or when notified by other city staff members or the city's waste hauler. If a violation occurs, a notice is sent to the customer to increase container or bin size. In addition, the city's contract with the waste hauler requires an overage charge for overflowing bins to motivate customers to adequately size bins/containers.

There are 60 public garbage and recycling containers in TMA No.4 to capture trash from pedestrians and other outdoor activities. There are 53 containers in subarea 4A, six in 4E, and one in 4F. The containers in TMA No. 4 are generally serviced once a week or more frequently as needed by City staff or the City's waste hauler.

Actions initiated after the MRP effective date: The City has developed a strategic plan for public area garbage containers to reduce public litter. The plan is attached in Appendix A, and is used to:

- Identify whether public area trash containers are sufficiently located in high trash generating areas and are adequately designed to manage trash types that typically are generated from activities occurring at these areas (e.g. containers with larger openings designed to accommodate larger trash items like pizza boxes are in locations where people dispose of these items, such as parks).
- Identify where increased level of inspection and maintenance of public area trash containers is needed at high trash generating sites.
- Include installation of specialty trash bins/containers (e.g. bins for cigarette ends, sharps, etc.) in specific locations to eliminate or reduce the prevalence of these items in stormwater convenience systems.
- Include the installation of new technologies (e.g. Big Belly Solar Trash Compactors) to reduce trash in stormwater and reduce the cost of adding public area trash containers.

The city's Environmental Program staff, Maintenance staff, and contracted consultants, Cascadia Consulting Group, Inc., worked collaboratively to identify problem sites and potential recommendations. Cascadia Consulting Group surveyed over 330 city-owned and operated public garbage containers for effectiveness of litter capture based on size, location, maintenance schedule, and waste composition. The strategic plan included recommendations to improve litter capture and associated cost with any improvement to the existing public bin management program. The city will begin implementing the plan starting July 1, 2014, and has earmarked \$65,000 in the Capital Improvement Plan to accomplish this task.

Actions planned for future implementation: For private bin management, annually distribute information about the City's Garbage and Rubbish Disposal Ordinance and potential litter issues as a result of noncompliance to all residential, commercial, and industrial businesses through a solid waste billing insert.

For public area trash container management in subarea 4A:

- Relocate two containers that have little to no use to problematic areas.
- Weekly monitoring is recommended for a total of 10 containers or increase container size or use compactor technology.
- Repair damaged containers to prevent garbage from escaping.
- Improve signage to increase visibility and promote proper disposal behavior.

For subarea 4B, implement specialty bins and consider new technologies to promote proper disposal behavior. For subarea 4C, implement weekly monitoring of four containers or increase container size or use compactor technology. For subarea 4F, implement weekly monitoring of one container, or add additional containers as there is a high rate of litter in the parking lot.

On-Land Trash Cleanup

Actions initiated after MRP effective date: The city's contracted waste hauler, Recology, picks up reported illegal dumping within 24 hours of receiving notification, removing much of the litter found in subareas 4B and 4C.

Anti-littering and Illegal Dumping Enforcement Activities

Actions planned for future implementation: Over the next few years, city staff will explore costs to survey and monitor areas 4B and 4C that continually experience illegal dumping. Possible solutions include installing cameras in order to issue fines to violators. The City of Menlo Park is also updating its General Plan that includes developing more resources and support to help homeless residents to find a place to live, which would reduce waste related to homeless encampments.

Product Bans- Refer to Jurisdiction Wide Control Measures.

Public Awareness and Outreach- Refer to Jurisdiction Wide Control Measures.

Enhanced Stormdrain Inlet Maintenance- Refer to Jurisdiction Wide Control Measures.

Anti-littering and Illegal Dumping Enforcement Activities- Refer to Jurisdiction Wide Control Measures.

Activities to Reduce Trash from Uncovered Loads- Refer to Jurisdiction Wide Control Measures.

Commercial Standards to Reduce Litter- Refer to Jurisdiction Wide Control Measures.

Jurisdiction-wide Control Measures

The City of Menlo Park actively pursues jurisdictional wide control measures that can further reduce litter while creating community values around water quality and resource conservation. The following are current or planned activities to further reduce litter and/or instill sustainable community values:

- Reusable Bag Ordinance (Currently Implementing and Planned Enhancement)
- Polystyrene Food Ware Prohibition (Currently Implementing and Planned Enhancement)
- Public Awareness and Outreach About Litter (Currently Implementing)
- Enhanced Stormdrain Inlet Maintenance (Currently Implementing)
- Anti-littering and Illegal Dumping Enforcement Activities (Currently Implementing)
- Activities to Reduce Trash from Uncovered Loads (Currently Implementing)
- Commercial Standards to Reduce Litter (Currently Implementing and Planned Enhancement)
- Improved Trash Bin/Container Management (Currently Implementing and Planned Enhancement)

Reusable Bag Ordinance

Actions initiated after the MRP effective date: On January 22, 2013, the Menlo Park City Council adopted San Mateo County's Reusable Bag Ordinance. The ordinance applies to all retail stores in the city, and started on April 22, 2013 (Earth Day). The ordinance prohibits all retailers from distributing plastic bags and a minimum of 10 cents must be charged for each paper bag provided at checkout (minimum price will increase to 25 cents in 2015). Customers can avoid paying a fee by bringing their own bag to shop. Menlo Park's ordinance can be accessed by visiting: http://www.menlopark.org/departments/env/Dep_env_bag_policy.html.

Retailers must keep complete and accurate records of the purchase and sale of recycled paper bags for a minimum of three years from the date of purchase or sale. Records must be available for potential inspection at the retail store's address. Enforcement is managed by the San Mateo County Health Department, and retailers not in compliance are subject to fines. City staff also annually audit a sample of businesses to ensure that no plastic bags are distributed and that a fee is being charged for bags at checkout.

Outreach efforts included letters to retailers informing them about the proposed ordinance, press releases, three public workshops and presentations, flyers in the City's solid waste billing inserts, flyers posted throughout the community, tabling event at Menlo Park Block Party, and information posted on the City's Environmental Programs webpage, Facebook, and Twitter pages. Free reusable bags are available to residents at all City community centers (e.g. Menlo Park Library, Senior Center, etc.) Marketing toolkits were also given to retailers to encourage their patrons to bring their own bag to shop.

Actions planned for future implementation: In 2016, the City will explore including food vendors in the ordinance.

Polystyrene Food Ware Ordinance

Actions initiated after the MRP effective date: On August 28, 2012, the Menlo Park City Council adopted San Mateo County's Polystyrene Food Ware Ordinance. The ordinance applies to all food vendors in the City and officially became effective on November 1, 2012. The ordinance prohibits food vendors, including restaurants, delis, cafés, markets, fast-food establishments, and vendors at fairs from dispensing prepared food in polystyrene containers labeled with a No. 6. Food vendors must provide alternative food ware products, such as biodegradable/compostable plates, cups, and take out containers. Menlo Park's Polystyrene Ordinance can be accessed by visiting: http://www.menlopark.org/departments/env/Dep_env_polord.html.

Enforcement is managed by the San Mateo County Health Department and food vendors not in compliance are subject to fines. Outreach was conducted for all Menlo Park food vendors, delis, cafés, markets, and fast-food establishments by sending letters to all vendors about the ordinance. Target media included the Chamber of Commerce Newsletter, flyers displayed throughout the community, community meetings and presentations, and press releases. Information was made available on the City's Environmental Programs webpage, Facebook and Twitter pages.

Actions planned for future implementation: In 2016, the City will explore regulating utensils and/or refining the ordinance to only allow compostable food ware to be used instead of other types of recyclable plastic. In addition, the city may explore prohibiting expanded polystyrene (EPS) food ware and ice chests sold at retail establishments.

Public Awareness and Outreach

Actions initiated prior to and continued after the MRP effective date: The City of Menlo Park implemented the following public education and outreach control measures prior to the effective date of the MRP and has continued to implement these measures since MRP adoption:

- SMCWPPP Public Information and Participation Program (Countywide): Through participation and funding of the San Mateo Countywide Water Pollution Prevention Program's (SMCWPPP) Public Information and Participation program (PIP), the City of Menlo Park plans to continue implementing litter reduction outreach to school-age children

and youth. SMCWPPP currently oversees a contract to provide direct outreach to grades K-5 in a school setting on behalf of all permittees. The contract is currently held by the Banana Slug String Band, which performs a presentation called “We All Live Downstream.” Through songs and interactive exercises, the message of not putting anything in the stormdrains (including trash) is delivered, along with basic concepts of the water cycle and the impact of pollution on aquatic life.

In addition, SMCWPPP has developed a presentation entitled “Water Pollution Prevention: Problems and Solutions” that is delivered to high school students. This presentation is dedicated to watershed and stormdrain education, and the impact of litter on local creeks and waterways. Both efforts are managed to ensure that schools in each community in the County are reached. For communities without High Schools, the feeder schools in neighboring communities are specifically targeted for presentations. In addition to outreach at the school sites, a number of student activity guides and coloring books related to watershed health and littering are provided to children who attend outreach events. Schools are also directly targeted in promotion of Coastal Cleanup Day.

PIP also participates in a regional anti-littering campaign developed by BASMAA targeted at youth ages 14 to 24. As acting chair of the BASMAA PIP committee, SMCWPPP PIP has participated in the development and dissemination of campaign materials, and has conducted local events on behalf of all jurisdictions to promote the campaign. The campaign, entitled “Be The Street You Want to See”, will soon transition from building a community of youth dedicated to not littering to engaging that community in action.

SMCWPPP, through its PIP program, plans to continue to conduct community outreach events on behalf of Permittees who request support. Outreach materials related to litter that are distributed include, in addition to the children’s materials listed above under Outreach to School-age Children or Youth, a promotional sign for cigarette smokers to discourage cigarette litter, and pocket ashtrays are given out. A general stormwater pollution prevention flyer in English and Spanish that includes litter reduction in its messaging is distributed. In addition to table outreach events conducted for specific Permittees, PIP also conducts a Countywide Event aimed to reach residents from throughout the County. PIP manages an online calendar which promotes cleanup events by non-profit organizations throughout the County. In FY 2012, PIP completed its 7th year acting as the county coordinator for Coastal Cleanup Day, increasing volunteer participation by 400% in that time, and trash removal increased by 300%.

During the term of the MRP, new outreach materials have been disseminated to the public, including reusable shopping bags to encourage reduction in use of plastic carryout bags. PIP has supported a countywide ban on carryout bags that began implementation on April 22, 2013. In addition, spring cleanups taking place in individual jurisdictions are promoted under one theme by PIP, entitled Spring Cleaning SMC. PIP assists in directing volunteers to cleanup events in their communities. SMCWPPP conducted a total of 11 outreach events on

behalf of various jurisdictions within the County in the 2012-13 fiscal year. SMCWPPP will also continue maintaining an online calendar of cleanups on a monthly basis. In addition to using the SMCWPPP website, flowstobay.org, to promote cleanups, PIP is actively involved in social media platforms such as Facebook, Twitter, You Tube, and Instagram to deliver anti-littering and cleanup messages.

- Coastal Cleanup Day Promotion (Countywide): On the countywide level, SMCWPPP also conducts annual press releases for Coastal Cleanup Day, and uses Twitter to promote cleanup events. These releases are intended to gain support and assistance for cleanup events conducted each September in local water bodies.
- BASMAA Regional Media Relations Project (Regional): Through participation and funding of the BASMAA Regional Media Relations Project, the City of Menlo Park is continuing to implement a media relations project partially designed to reduce littering from target audiences in the Bay Area. The goal of the BASMAA Media Relations Project is to generate media coverage that encourages individuals to adopt behavior changes to prevent water pollution, including littering. At least two press releases or PSAs focus on litter issues each year (e.g., creek clean-up activities, preventing litter by using reusable containers, etc.). In FY 12-13, the Media Relations project developed a press release new and recent bag bans in cities around the region. The pitch included information on the litter caused by plastic bags. Information ran on KBAY, KCBS and on eight Bay Area Patch.com sites.

Actions Planned for future implementation: The City of Menlo Park is currently implementing or planning to implement the following public education and outreach control measures that were initiated after the MRP was adopted:

- BASMAA Youth Outreach Campaign (Regional): Through participation and funding of the regional BASMAA Youth Outreach Campaign, the City of Menlo Park is implementing an outreach campaign designed to reduce littering from a target audience in the Bay Area. The Youth Outreach Campaign was launched in September 2011 and aims to increase the awareness of Bay Area Youth ages 16-24 on litter and stormwater pollution issues, and eventually change their littering behaviors. Combining the ideas of Community Based Social Marketing with traditional advertising, the Youth Campaign aims to engage youth to enable the peer-to-peer distribution of Campaign messages. The Campaign will at least run through FY 13-14. A brief description of the Campaign activities is provided below:
 - Raising Awareness: The Campaign is raising awareness of the target audience on litter and stormwater pollution issues. Partnerships with youth commissions, high schools, and other youth focused organizations have been developed to reach the target audience. Messages targeted to youth have been created and distributed via paid advertising, email marketing, campaign website and social networking sites (e.g., Facebook and Twitter).
 - Engage the Youth - The advertisements encourage the audience to participate in the Youth Campaign by joining a Facebook page, entering a contest, taking an online quiz, etc., and providing their contact information. At the beginning of FY 12-13, a

video contest was launched to get Bay Area youth further involved in the Campaign. An online voting system was used to select the winning entry. Media advertising was conducted to promote the winning entry.

- Change Behaviors: To move the audience along the behavior change continuum, the Campaign is using electronic platforms such as email marketing and social networking sites to encourage participants to engage in increasingly more difficult behavior changes, such as participating in a clean-up, organizing a clean-up, etc.
- Maintain Engagement: The Campaign continues to interact with the target audience through email marketing and social media websites.

The Youth Campaign includes a pre and post campaign survey to evaluate the effectiveness of outreach. The pre-campaign survey was conducted in FY 11-12 and the post campaign survey will begin in FY 13-14. Other evaluation mechanisms, such as website hits, number of youth engaged in the Campaign's social networking website, etc. are also being used to evaluate its effectiveness in increasing awareness and changing behavior.

Activities in FY 12-13 included maintaining the website www.BetheStreet.org, Facebook page, and Instagram account. A video contest asking participants to submit their best anti-litter video was also conducted. The Be the Street campaign received 52 entries in response to the contest. The winning video was promoted on television, Pandora (online music site), YouTube, Google, and Facebook.

Enhanced Stormdrain Inlet Maintenance

Actions initiated prior to and continued after the MRP effective date: Annually in August and September, 54 stormdrain inlets that are historically known to contain debris and litter are cleaned before the wet season starts. In addition, during the wet season (December-April), all stormdrain inlets are inspected and clean as needed.

Anti-littering and Illegal Dumping Enforcement Activities

Actions initiated after MRP effective date: The city's contracted waste hauler, Recology, picks up reported illegal dumping within 24 hours of receiving notification, significantly reducing litter in the stormdrain system.

Actions planned for future implementation: Over the next few years, city staff will explore costs to survey and monitor areas that continually experience illegal dumping. Possible solutions include installing cameras in order to issue fines to violators. The City of Menlo Park is also updating its General Plan that includes developing more resources and support to help homeless residents to find a place to live, which would reduce waste related to homeless encampments.

Activities to Reduce Trash from Uncovered Loads

Actions initiated after MRP effective date: Menlo Park municipal code section 7.04.070 requires that all vehicles used in the collection, removal or hauling of garbage shall be watertight and equipped with a covering, maintained in place to prevent the needless escape of odors therefrom and the dropping of garbage from the vehicle. Menlo Park's police department actively enforces this ordinance as there are direct health and safety issues associated with uncovered loads.

Commercial Standards to Reduce Litter

Actions initiated after MRP effective date: Menlo Park municipal code section 7.42.120 requires owners of parking lots, gasoline stations, industrial facilities, commercial facilities, store fronting city streets, etc. to comply with the following litter reduction standards:

- No person shall throw, deposit, leave, maintain, keep, or permit to be thrown, deposited, placed, left or maintained, any refuse, rubbish, garbage, or other discarded or abandoned objects, articles, and accumulations, in or upon any street, alley, sidewalk, storm drain, inlet, catch basin, conduit or other drainage structures, business place, or upon any public or private lot of land in the city, so that the same might be or become a pollutant, except in containers or in lawfully established dumping grounds.
- The occupant or tenant, or in the absence of occupant or tenant, the owner, lessee, or proprietor of any real property in the city in front of which there is a paved sidewalk shall maintain said sidewalk free of litter to the maximum extent practicable.
- No person shall throw or deposit litter in any fountain, pond, lake, stream or any other body of water in a park or elsewhere within the city.
- Persons owning or operating a parking lot, gas station pavement or similar structure shall clean those structures as frequently and thoroughly as practicable in a manner that does not result in discharge of pollutants to the city storm sewer system.

Actions planned for future implementation: Annually distribute information to all commercial and industrial businesses about the ordinance and provide information on effective trash control measures.

Improved Trash Bin/Container Management- Private Receptacles

Receptacles used to place/store trash or recyclables prior to collection by a public agency or private waste hauler reduce the potential for littering and trash loading to stormwater conveyance systems and receiving waters. Private Trash/Recycling Bins are receptacles for placing trash or recyclables generated from a household, business, or other location that is serviced by a garbage hauler. Bins are specifically-designed, heavy-duty plastic wheeled containers with hinged lids; or large multi-yard metal or plastic containers rectangular in shape.

The effectiveness of bins/containers in reducing trash in the environment is dependent upon the location and density of the receptacles, size of the bin/container in relationship to the size needed to service users, frequency of maintenance, and the ability of the bin/container to capture and contain the trash deposited.

Actions initiated prior to and continued after the MRP effective date: The City requires adequate sizing and covers of private garbage and recycling bins per section 7.04.030 of the City's Garbage and Rubbish Disposal Ordinance. The ordinance is enforced on a compliant basis or when notified by other city staff members or the city's waste hauler. If a violation occurs, a notice is sent to the customer to increase container or bin size. In addition, the city's contract with the waste hauler

requires an overage charge for overflowing bins to motivate customers to adequately size bins/containers.

Actions planned for future implementation: Annually distribute information about the ordinance and potential litter issues as a result of noncompliance to all residential, commercial, and industrial businesses through a solid waste billing insert.

Creek and Shoreline Hot Spot Cleanups

The city of Menlo Park has one designated hot spot (see Figure 5 for location), which is in the San Francisquito Creek, and starts at El Camino and Alma Street moving towards the bay. Typical items found are fast food wrappers, beverage containers, plastic bags, shopping carts, scrap metal, bicycles, and fabric (e.g. blankets, clothes, etc.). The main source of trash is from homeless encampments, pedestrian traffic, stormwater conveyance system, and illegal dumping.

The City hosts a cleanup event annually in partnership with Acterra, a nonprofit organization dedicated to creek stewardship activities. The event occurs on Coastal Cleanup Day in September. On September 21, 2013, 353 cubic feet of trash was collected from the creek. There was also a noticeable decrease in plastic bags found in the creek compared to prior years due to the City's recent adoption of a Reusable Bag Ordinance. The bags found in the creek mainly came from restaurants.

In addition, the City annually contributes financially to Acterra, which allows the nonprofit to hold several creek clean up events through the year. Last fiscal year 2012-13, Acterra and their volunteers removed 3,250 pounds of trash from the creek.

Summary of Trash Control Measures

Trash Management Area 1

- Street Sweeping Program (Currently Implementing)
- Property Owner Litter Reduction Compliance Standards (Planned New Measure)
- Full Capture Treatment Devices (Currently Implementing)
- Improved Trash Bin/Container Management (Currently Implementing and Planned Enhancements)

Trash Management Area 2

- Street Sweeping Program (Currently Implementing)
- Property Owner Litter Reduction Compliance Standards (Planned New Measure)
- Full Capture Treatment Devices (Currently Implementing)
- Improved Trash Bin/Container Management (Currently Implementing and Planned Enhancements)
- On-Land Trash Cleanup (Planned New Measure)

Trash Management Area 3

- Street Sweeping Program (Currently Implementing)
- Property Owner Litter Reduction Compliance Standards (Planned New Measure)
- Full Capture Treatment Devices (Currently Implementing)

- Improved Trash Bin/Container Management (Currently Implementing and Planned Enhancements)

Trash Management Area 4

- Street Sweeping Program (Currently Implementing)
- Property Owner Litter Reduction Compliance Standards (Planned New Measure)
- Improved Trash Bin/Container Management (Currently Implementing and Planned Enhancements)
- On-Land Trash Cleanup (Currently Implementing)

Jurisdiction Wide Trash Management (All TMAs)

- Reusable Bag Ordinance (Currently Implementing and Planned Enhancement)
- Polystyrene Food Ware Prohibition (Currently Implementing and Planned Enhancement)
- Public Awareness and Outreach About Litter (Currently Implementing and Planned Enhancement)
- Enhanced Stormdrain Inlet Maintenance (Currently Implementing)
- Anti-littering and Illegal Dumping Enforcement Activities (Currently Implementing)
- Activities to Reduce Trash from Uncovered Loads (Currently Implementing)
- Commercial Standards to Reduce Litter (Currently Implementing and Planned Enhancement)
- Improved Trash Bin/Container Management-Private Receptacles (Currently Implementing and Planned Enhancement)

The control measures described above are believed to achieve the full litter reduction level required in each management area. If assessment shows that additional measures are needed, an adaptive management process will be used to add or adapt trash control measures. Each trash management area already includes possible alternatives, and is described in each TMA section.

3.3 Control Measure Implementation Schedule

The City has implemented trash control measures prior to the effective date of the MRP to address litter in local creeks and on land. New measures will address remaining litter issues discovered during the trash assessments, and enhance existing programs and policies. Table 7 identifies implementation timelines for trash control measures in each TMA. These measures will be continued to keep the watershed litter free.

Table 7. City of Menlo Park trash control measure implementation schedule.

Trash Management Area and Control Measures	Pre-MRP	Short-Term					Long-Term							
		FY 2009-2010	FY 2010-2011	FY 2011-2012	FY 2012-2013	FY 2013-2014 ^a	FY 2014-2015	FY 2015-2016	FY 2016-2017 ^b	FY 2017-2018	FY 2018-2019	FY 2019-2020	FY 2020-2021	FY 2021-2022 ^c
TMA No.1														
Street Sweeping	X													
Property Owner Litter Reduction Compliance Standards										X				
Full Capture Treatment Devices				X										
Improved Trash Bin/Container Management	X						X	X	X					
TMA No.2														
Street Sweeping	X													
Property Owner Litter Reduction Compliance Standards										X				
Full Capture Treatment Devices					X									
Improved Trash Bin/Container Management						X	X	X	X					
On-Land Trash Cleanup									X					
TMA No. 3														
Street Sweeping	X													
Property Owner Litter Reduction Compliance Standards										X				

City of Menlo Park
Long Term Trash Load Reduction Plan and Assessment Strategy

Trash Management Area and Control Measures	Pre-MRP	Short-Term					Long-Term							
		FY 2009-2010	FY 2010-2011	FY 2011-2012	FY 2012-2013	FY 2013-2014 ^a	FY 2014-2015	FY 2015-2016	FY 2016-2017 ^b	FY 2017-2018	FY 2018-2019	FY 2019-2020	FY 2020-2021	FY 2021-2022 ^c
Full Capture Treatment Devices		X	X	X										
Improved Trash Bin/Container Management							X	X	X					
TMA No. 4														
Street Sweeping	X													
Property Owner Litter Reduction Compliance Standards										X				
Improved Trash Bin/Container Management							X	X	X					
On-Land Trash Cleanup			X											
Anti-littering and Illegal Dumping Enforcement Activities														X
Jurisdiction-wide Control Measures														
Reusable Bag Ordinance					X				X					
Polystyrene Food Ware Prohibition					X				X					
Public Awareness and Outreach About Litter	X				X	X								
Enhanced Stormdrain Inlet Maintenance	X													
Anti-littering and Illegal Dumping Enforcement Activities	X													X
Activities to Reduce Trash from Uncovered Loads	X								X					
Commercial Standards to Reduce Litter	X								X					
Improved Trash Bin/Container Management - Private Receptacles							X	X	X					
Creek and Shoreline Hot Spot Cleanups														
Coastal Cleanup Day	X													
Funding to Acterra to coordinate several volunteer cleanup events annually	X													

^aJuly 1, 2014 - 40% trash reduction target ^bJuly 1, 2017 - 70% trash reduction target ^cJuly 1, 2022 - 100% trash reduction target

4.0 PROGRESS ASSESSMENT STRATEGY

Provision C.10.a.ii of the MRP requires Permittees to develop and implement a trash load reduction tracking method that will be used to account for trash load reduction actions and to demonstrate progress and attainment of trash load reduction targets. Early into the MRP, Permittees decided to work collaboratively to develop a trash load reduction tracking method through the Bay Area Stormwater Management Agencies Association (BASMAA). Permittees, Water Board staff and other stakeholders assisted in developing Version 1.0 of the tracking method. On behalf of all MRP Permittees, the Bay Area Stormwater Management Agencies Association (BASMAA) submitted Version 1.0 to the Water Board on February 1, 2012.

The Trash Assessment Strategy (Strategy) described in this section is intended to serve as Version 2.0 of the trash tracking method and replace version 1.0 previously submitted to the Water Board. The Strategy is specific to Permittees participating in the San Mateo Countywide Water Pollution Prevention Program (SMCWPPP), including the City of Menlo Park. The City intends to implement the Strategy in phases and at multiple geographical scales (i.e., jurisdiction-wide and trash management area) in collaboration with SMCWPPP. Pilot implementation is scheduled for the near-term and as assessment methods are tested and refined, the Strategy will be adapted into a longer-term approach. The Strategy selected by the City is described in the following sections.

4.1 SMCWPPP Pilot Assessment Strategy

The following SMCWPPP Pilot Trash Assessment Strategy (SMCWPPP Pilot Strategy) was developed by SMCWPPP on behalf of the City and other San Mateo County Permittees. The SMCWPPP Pilot Strategy will be implemented at a pilot scale on a countywide basis and includes measurements and observations in the City of Menlo Park.

Management Questions

The SMCWPPP Pilot Strategy is intended to answer the following core management questions over time as trash control measures outlined in section 3.0 are implemented and refined:

- Are the MS4 trash load reduction targets (i.e., 40%, 70%, and No Adverse Impacts) being achieved?
- Are there trash problems in receiving waters (e.g., creeks and rivers)?
- If trash problems in receiving waters exist, what are the important sources and transport pathways?

The SMCWPPP Pilot Strategy, including indicators and methods, is summarized in this section and fully described in the SMCWPPP Pilot Trash Assessment Strategy, a compendium document submitted to the Water Board on February 1, 2014 on behalf of all SMCWPPP Permittees (SMCWPPP 2014).

Indicators of Progress and Success

The management questions listed in the previous section will be addressed by tracking information and collecting data needed to report on a set of key environmental indicators. Environmental indicators are simple measures that communicate what is happening in the environment. Since trash in the environment is very complex, indicators provide a more practical and economical way to track the state of the environment than if we attempted to record every possible variable.

With regard to municipal stormwater trash management, indicators are intended to detect progress towards trash load reduction targets and solving trash problems. Ideally, indicators should be robust and able to detect progress that is attributable to multiple types of trash control measure implementation scenarios. Assessment results should also provide Permittees with an adequate level of confidence that trash load reductions from stormdrain systems have occurred, while also assessing whether trash problems in receiving waters have been resolved. Indicators must also be cost effective, relatively easy to generate, and understandable to stakeholders.

Primary and secondary indicators that SMCWPPP Permittees will use to answer core management questions include:

Primary Indicators:

- 1-A Reduction in the level of trash present on-land and available to stormdrain systems
- 1-B Effective full capture device operation and maintenance

Secondary Indicators:

- 2-A Successful levels of trash control measures implementation
- 2-B Reductions in the amount of trash in receiving waters

In selecting the indicators above, the City of Menlo Park in collaboration with SMCWPPP and other SMCWPPP Permittees recognize that no one environmental indicator will provide the information necessary to effectively determine progress made in reducing trash discharged from stormdrain systems and improvements in the level of trash in receiving waters. Multiple indicators were therefore selected.

The ultimate goal of municipal stormwater trash reduction strategies is to reduce the impacts of trash associated with stormdrain systems on receiving waters. Indicators selected to assess progress towards this goal should ideally measure outcomes (e.g., reductions in trash discharged). The primary indicators selected by SMCWPPP are outcome-based and include those that are directly related to stormdrain system discharges. Secondary indicators are outcome or output-based and are intended to provide additional perspective on and evidence of, successful trash control measure implementation and improvements in receiving water condition with regard to trash.

As described in Section 2.2, trash is transported to receiving waters from pathways other than Stormdrain systems, which may confound our ability to observe stormdrain system-associated reductions in creeks and shorelines. Due to this challenge of linking stormdrain system control measure implementation to receiving water conditions, the receiving water based indicator is currently considered a secondary indicator. Evaluations of data on the amount of trash in receiving waters that are conducted over time through the Pilot Assessment Strategy will assist the City in

further determinations of the important sources and pathways causing problems in local creeks, rivers and shorelines.

Pilot Assessment Methods

This section briefly summarizes the preliminary assessment methods that the City of Menlo Park will implement through the SMCWPPP Pilot Strategy to generate indicator information described in the previous section. Additional information on each method can be found in the SMCWPPP Pilot Trash Assessment Strategy submitted to the Water Board by SMCWPPP on behalf of the City.

1-A. On-land Visual Assessments

As part of the Trash Generation Map assessment and refinement process (see Section 2.3.1), a draft on-land visual assessment method was developed to assist Permittees in confirming and refining trash generating area designations (i.e., very high, high, moderate and low trash generating categories). The draft on-land visual assessment method is intended to be a cost-effective tool and provide Permittees with a viable alternative to quantifying the level of trash discharged from Stormdrain systems. As part of BASMAA's *Tracking California's Trash* grant received from the State Water Resources Control Board (see Section 4.2), quantitative relationships between trash loading from Stormdrain systems and on-land visual assessment condition categories will be established. Condition categories defined in the draft on-land assessment protocol are listed in Table 8

Table 8. Trash condition categories used in the draft on-land visual assessment protocol.

Trash Condition Category	Summary Definition
A (Low)	Effectively no trash is observed in the assessment area.
B (Moderate)	Predominantly free of trash except for a few pieces that are easily observed.
C (High)	Trash is widely/evenly distributed and/or small accumulations are visible on the street, sidewalks, or inlets.
D (Very High)	Trash is continuously seen throughout the assessment area, with large piles and a strong impression of lack of concern for litter in the area.

On-land visual assessments will be conducted in trash management areas within the City of Menlo Park as part of the SMCWPPP Pilot Trash Assessment Strategy. On-land assessments are intended to establish initial conditions and detect improvements in the level of trash available to Stormdrain systems over time. More specifically, on-land visual assessment methods will be conducted in areas not treated by trash full capture devices in an attempt to evaluate reductions associated with other types of control measures. Assessment methods for areas treated by full capture devices are described in this next section.

Given that the on-land assessment method and associated protocol have not been fully tested and refined, initial assessments will occur at a pilot scale in the City and in parallel to the *Tracking California's Trash* project. The frequency of assessments and number of sites where assessments will occur during the pilot stage are more fully described in the SMCWPPP Pilot Trash Assessment Strategy (SMCWPPP 2014).

1-B. Full Capture Operation and Maintenance Verification

Consistent with the MRP, adequate inspection and maintenance of trash full capture devices is required to maintain full capture designation by the Water Board. The City of Menlo Park is currently developing an operation and maintenance verification program (Trash O&M Verification Program), via SMCWPPP, to ensure that devices are inspected and maintained at a level that maintains this designation.

The SMCWPPP Trash O&M Verification Program will be modeled on the current O&M verification program for stormwater treatment controls implemented consistent with the Permit new and redevelopment requirements. Additional details regarding the Trash O&M Verification Program can be found in the SMCWPPP Pilot Trash Assessment Strategy (SMCWPPP 2014).

2-A. Control Measure Effectiveness Evaluations

In addition to on-land trash assessments and full capture operation and maintenance verification, the City will also conduct assessments of trash control measures implemented within their jurisdictional area. Assessment methods will be selected based on trash sources and the type of control measure being implemented. Control measure effectiveness evaluations are more fully described in the SCVURPPP Pilot Trash Assessment Strategy. The following are example assessment methods that may be used to demonstrate successful control measure implementation and progress towards trash reduction targets:

- Product-related Ordinances – Descriptions of outreach efforts, tracking and reporting business compliance rates, or other metrics of control measure performance.
- Street Sweeping- Identification sweeping frequency and the ability to sweep to the curb by primary TMA, including any enhancements that have been implemented; and any other metrics demonstrating the enhanced performance of street sweeping.
- Public/Private Trash Container Management - Descriptions of control measures implemented to prevent overflowing trash containers or promoting the more effective use of public/private bins, including any new or enhancements to existing actions; and any other metrics demonstrating the performance of the control measure.
- Public Outreach and Education – Descriptions of outreach and education actions specific to trash deduction, including the number of events conducted within the municipality; descriptions of effectiveness measurements, including the results of pre- and post-implementation surveys or other metrics.
- On-land Cleanups and Enforcement – Descriptions of on-land cleanup actions, including any enhancements that have been implemented; identification of whether on-land cleanup are Permittee or volunteer-led; or other metrics of control measure performance.

- Storm Drain Inlet Maintenance – Descriptions of the level of maintenance, including any enhancement to maintenance frequency; the numbers of inlets where enhanced maintenance is being implemented; and any other metrics demonstrating the performance of inlet maintenance.
- Anti-littering and Illegal Dumping Prevention/Enforcement - Descriptions of control measures implemented to prevent littering and illegal dumping, including any new or enhancements to existing actions; descriptions and results of enhanced enforcement actions; and any other metrics demonstrating the performance of the control measure.
- Prevention of Uncovered Loads - Descriptions of control measures implemented to prevent trash dispersion from uncovered loads, including any new or enhancements to existing actions; descriptions and results of enhanced enforcement actions; and any other metrics demonstrating the performance of the control measure.
- Partial Capture Devices – Descriptions, numbers and types of devices implemented; maintenance frequencies by device or groups of devices; and any other metrics demonstrating the partial capture device performance.
- Other Control Measures - Descriptions of control measures implemented to prevent or intercept trash before discharge to receiving waters, and any other metrics demonstrating the performance of the control measure.

2-C. Receiving Water Condition Assessments

The ultimate goal of stormwater trash management in the Bay Area is to significantly reduce the amount of trash found in receiving waters. In the last decade, San Mateo County Permittees and volunteers have collected data on the amounts of trash removed during cleanup events. More recently, Permittees have conducted trash assessments in creek and shoreline hotspots using standardized assessment methods. In an effort to answer the core management question *Have trash problems in receiving waters been resolved?*, the City of Menlo Park plans to continue conducting receiving water condition assessments at trash hot spots a minimum of one time per year. Assessment will be conducted consistent with Permit hot spot cleanup and assessment requirements. Additional information on receiving water assessment methods can be found in the SMCWPPP Pilot Trash Assessment Strategy (SMCWPPP 2014).

4.2 BASMAA “Tracking California’s Trash” Project

The SMCWPPP Pilot Assessment Strategy described in the previous section recognizes that outcome-based trash assessment methods needed to assess progress toward trash reduction targets are not well established by the scientific community. In an effort to address these information gaps associated with trash assessment methods, the Bay Area Stormwater Management Agencies Association (BASMAA), in collaboration with SMCWPPP, the 5 Gyres Institute, San Francisco Estuary Partnership, the City of Los Angeles, and other stormwater programs in the Bay Area, developed the *Tracking California’s Trash* Project. The Project is funded through a Proposition 84 grant awarded to BASMAA by the State Water Resources Control Board (SWRCB) who recognized the need for standardized trash assessment methods that are robust and cost-effective.

The Project is intended to assist BASMAA member agencies in testing trash assessment and monitoring methods needed to evaluate trash levels in receiving waters, establish control measures that have an equivalent performance to trash full capture devices, and assess progress in trash reduction over time. The following sections provide brief descriptions of tasks that BASMAA will conduct via the three-year Project. Full descriptions of project scopes, deliverables, and outcomes will be developed as part of the task-specific Sampling and Analysis Plans required by the SWRCB during the beginning of the Project. The Project is currently underway and will continue through 2016.

Testing of Trash Monitoring Methods

BASMAA and the 5 Gyres Institute will evaluate the following two types of assessment methods as part of the Project:

- **Trash Flux Monitoring** – Trash flux monitoring is intended quantify the amount of trash flowing in receiving waters under varying hydrological conditions. Flux monitoring will be tested in up to four receiving water bodies in San Francisco Bay and/or the Los Angeles areas. Methods selected for evaluation and monitoring will be based on a literature review conducted during this task and through input from technical advisors and stakeholders. Monitoring is scheduled to begin in 2014 and will be completed in 2016.
- **On-land Visual Assessments** – As part of the Project, BASMAA will also conduct an evaluation of on-land visual assessment methods that are included in the SMCWPPP Pilot Assessment Strategy. The methods are designed to determine the level of trash on streets and public right-of-ways that may be transported to receiving waters via Stormdrain systems. BASMAA plans to conduct field work associated with the evaluation of on-land visual assessment at a number of sites throughout the region. To the extent practical, sites where the on-land methods evaluations take place will be coordinated with trash flux monitoring in receiving waters. On-land assessments will occur in areas that drain to trash full capture devices, and all sites will be assessed during wet and dry weather seasons in order to evaluate on-land methods during varying hydrologic conditions. Monitoring is scheduled to begin in 2014 and will be completed in 2016.

Full Capture Equivalent Studies

Through the implementation of BASMAA's *Tracking California's Trash* grant-funded project, a small set of "Full Capture Equivalent" projects will also be conducted in an attempt to demonstrate that specific combinations of control measures will reduce trash to a level equivalent to full capture devices. Initial BMP combinations include high-frequency street sweeping, and enhanced street sweeping with auto-retractable curb inlet screens. Other combinations will also be considered. Studies are scheduled to begin in 2014 and will be completed in 2016.

4.3 Long-Term Assessment Strategy

The City of Menlo Park is committed to implementing standardized assessment methods post-2016 based on the lessons learned from pilot assessments and studies that will occur between 2014 and 2016. Assessment activities described in the previous sections will evaluate the utility of different assessment methods to demonstrate progress towards trash reduction targets and provide recommended approaches for long-term implementation. Lessons learned will be submitted to the Water Board with the FY 2015-2016 Annual Report and a revised Strategy will be developed and submitted, if necessary. The revised Strategy will include agreed upon assessment methods that

will be used to demonstrate progress during the remaining term of trash reduction requirements. Reporting using the new/revised methods will begin with the FY 2016-17 Annual Report.

4.4 Implementation Schedule

The implementation schedule for the SMCWPPP Pilot Implementation Strategy, BASMAA's Tracking California's Trash project, and the Long-Term Assessment Strategy are included in Table 9. Load reduction reporting milestones are also denoted in the table. The schedule is consistent with the need for near-term pilot assessment results to demonstrate progress toward short-term targets, while acknowledging the need for testing and evaluation of assessment methods and protocols prior to long-term implementation. For more detailed information on implementation timelines, refer to the SMCWPPP Pilot Trash Assessment Strategy (SMCWPPP 2014) and monitoring plans developed as part of BASMAA's Tracking California's Trash project.

Table 9. City of Menlo Park trash progress assessment implementation schedule.

Trash Assessment Programs and Methods	Prior to FY 2013-14	Fiscal Year								
		2013-14 ^a	2014-15	2015-16	2016-17 ^b	2017-18	2018-19	2019-20	2020-21	2021-22 ^c
Pilot Trash Assessment Strategy (SMCWPPP)										
On-land Visual Assessments										
Initial (Baseline) Assessments	X									
Pilot Progress Assessments		X	X	X	X					
Full Capture Operation and Maintenance Verification			X	X	X					
Control Measure Effectiveness Evaluations	X	X	X	X	X					
Receiving Water Condition Assessments	X	X	X	X	X					
Tracking California’s Trash Project (BASMAA)										
Testing of Trash Monitoring Methods										
Trash Flux Monitoring Protocol Testing			X	X	X					
On-land Visual Assessment Evaluations			X	X	X					
Full Capture Equivalent Studies			X	X	X					
Long-Term Trash Assessment Strategy (SMCWPPP)						X	X	X	X	X

^aJuly 1, 2014 - 40% trash reduction target

^bJuly 1, 2017 - 70% trash reduction target

^cJuly 1, 2022 - 100% trash reduction target

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APPENDIX A- STRATEGIC PLAN TO IMPROVE PUBLIC AREA TRASH AND RECYCLING CONTAINER MANAGEMENT

**Please note appendices for this plan have not been included to save paper and space. They are available upon request.*



STRATEGIC PLAN TO IMPROVE PUBLIC AREA TRASH AND RECYCLING CONTAINER MANAGEMENT

Prepared by: Cascadia Consulting Group, Inc. | EOA, Inc.
Prepared for: City of Menlo Park

January 2014



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APPENDICES

Appendix A. Detailed Methodology

Appendix B. Hauler Provided Inventory and Service Information for Public Containers

Appendix C. City of Menlo Park Public Litter Container Field Survey Plan

Appendix D. City of Menlo Park Public Litter Container Survey Results and Recommendations for Improved Container Management (Excel file)



Appendix E. City of Menlo Park Trash Generation Rate and Trash Management Area Map

Appendix F. City of Menlo Park 2013 Staff Salaries

Appendix G. Types of Existing Public Litter Containers



Executive Summary

OVERVIEW

The City of Menlo Park (the City) is currently in the process of implementing its 2009 National Pollutant Discharge Elimination System (NPDES) Permit, also known as the Municipal Regional Permit (MRP). This Permit is issued by the San Francisco Bay Regional Water Quality Control Board (SFRWQCB). Section C.10 of this Permit identifies trash/litter as a priority pollutant and requires that the City adopt stringent and escalating control measures to reduce the amount of trash entering the storm drain system. Through control measures, the City must reduce trash loads to the storm drain system by 40% by 2014, 70% by 2017, and 100% by 2022.

This Strategic Plan to Improve Public Area Trash and Recycling Container Management (Strategic Plan) presents recommended actions that the City can take to address litter generation in public areas. The placement and maintenance of public containers can be an effective control measure to reduce the amount of litter generated from public spaces such as parks, community facilities, transit stations, and business districts. For this control measure to be effective, containers must be designed and labeled appropriately; be provided in adequate sizes, numbers, and locations; be serviced on a schedule that prevents overflow; and be regularly monitored and maintained to address container damage and persistent litter.

To develop this Strategic Plan, the City hired Cascadia Consulting Group, Inc., assisted by EOA, Inc., (the Project Team) to conduct an in-depth field study of the City's existing public containers, evaluate existing containers for their efficacy in preventing or reducing litter, and provide recommendations for programmatic changes for public containers to further reduce litter and trash loading to the City's storm drain system.

RESULTS AND RECOMMENDATIONS

Through field research and interviews with City staff and its current municipal solid waste hauler (Recology San Mateo County), the Project Team found that the City's existing public garbage and recycling container program needs improvement in the following areas:

- **Container placement and maintenance.** Some existing containers are underused, have reduced functionality, or are not in the appropriate locations to prevent litter.
- **Inventory of container locations and service schedules.** Current hauler container inventories, including service levels, were found to be inaccurate or unclear. Containers appear to have been relocated or removed over time. Additionally, the City does not have an inventory of City-serviced containers.
- **Litter control by the City.** Litter control activities by the City are limited by the lack of: containers in certain litter-generating areas, a litter monitoring program, and a City-wide litter cleanup program outside City parks and facilities.



- **Engagement of private property owners.** Many businesses are contributing to litter through unkempt parking lots and dumpster enclosure areas, despite municipal code requirements to control litter.
- **Recovery of recyclable materials.** The City does not have enough recycling containers, and the majority of existing recycling containers are not clearly labeled to indicate all the recyclables accepted by the hauler.
- **Cigarette end litter.** The City has a limited number of public cigarette receptacles, particularly when compared to the number of public receptacles for other garbage.

Four areas of the City have been documented as high trash generation areas. Field research confirmed two of these areas as having high litter levels. The third high trash generation area is located adjacent to an area with litter problems but had no problem itself. The fourth area was not found to have any litter issues.

During field research a total of 330 containers were surveyed to confirm container locations and types; rate containers on four key litter factors (container fullness, nearby litter levels, container condition, and condition of recycling container signage); and visually assess waste composition. Of these containers, 48% (159 containers) were found to be in very good condition, meaning no improvements and limited to no monitoring is recommended. Few litter issues were observed at these sites. Conversely, 24% (79 containers) were rated in poor condition, indicating a litter problem that should be resolved through regular monitoring and container or service improvements.

Based on the results of the field research, the following actions are recommended to improve trash and recycling container management for reducing litter and trash loads to the storm drain system:

1. **Relocate Existing Containers.** A total of 11 containers are proposed for relocation due to underuse or to alleviate litter issues at another container or at a site that does not currently have a container.
2. **Update Container Inventories.** An accurate inventory of hauler- and City-serviced containers—including sizes, types, and service levels—is necessary to support servicing and monitoring that identifies and resolves litter issues.
3. **Implement an Inspection and Monitoring Program.** Field research identified 16 areas, encompassing approximately 100 containers, which are a high priority for monitoring. A monitoring program for issues such as overflow, litter generation, and missed collection will help the City identify, prioritize, and resolve litter problems.
4. **Increase Litter Cleanup.** A litter cleanup program would address the remaining trash that is not captured by public collection containers. The program should include outreach to private property owners and partnerships with transit agencies as well as cleanup efforts by City maintenance staff.
5. **Repair Damaged Containers and Improve Container Signage.** Twenty-six containers were identified for repair (primarily lid replacement) to reduce their contribution to litter generation.



Additionally, to recover more recyclables that may otherwise end up as garbage or litter, 23 recycling containers were identified as needing new signage.

6. **Add New Containers or Change Container Types.** Twenty-four areas were identified as having litter problems that could be reduced by adding new or increasing existing public containers. Other containers are recommended for replacement because their size or design limits their use by the public.
7. **Implement Specialty Bins and Consider New Technologies.** Research requested by the City identified container options to collect specialty items such as cigarette ends and California Redemption Value (CRV) containers. Research also addressed the new technologies of solar compactor systems and other containers to reduce litter and capture garbage and recycling.

This Strategic Plan outlines a proposed timeline and planning level-costs for each of the recommended activities. Recommendations that target litter problem areas, or high litter generation areas, identified within the city that are expected to have comparatively lower costs are recommended for immediate implementation following the adoption of this Strategic Plan. Implementation of this Strategic Plan is scheduled to begin July 1, 2014 and continue during the Long-Term Plan, or by July 1, 2017.



Overview

The City of Menlo Park (the City) is currently in the process of implementing its 2009 National Pollutant Discharge Elimination System (NPDES) Permit, also known as the Municipal Regional Permit (MRP). This Permit is issued by the San Francisco Bay Regional Water Quality Control Board (SFRWQCB). Provision C.10 of the Permit identifies trash as a priority pollutant and requires the City to adopt stringent and escalating control measures to reduce the amount of trash entering the Municipal Separate Storm Sewer System (MS4). Specifically, the MRP requires a 40% reduction in trash loads to the MS4 by July 1, 2014. Additional load reductions are likely to be required in subsequent Permits.

As part of the MRP, the City is required to fully implement its Short-Term Trash Load Reduction Plan (Short-Term Plan) by July 1, 2014.¹ By July 1, 2022, the City will also be required to fully implement a Long-Term Trash Load Reduction Plan (Long-Term Plan), to be adopted February 1, 2014. These plans identify the litter reduction control measures the City will implement to achieve the short-term (40%) and long-term (70% and 100%) targets for trash load reduction.

Included among the control measures identified in the City's Short-Term Plan was improved management of public trash and recycling containers to reduce litter generated in public areas. This measure outlines the placement of convenient and adequate public containers where individuals can place trash or recyclables prior to collection by municipal staff or a private waste hauler. This control measure may reduce the potential for litter to enter the storm drain system.²

To identify specific recommendations for improving public trash and recycling container management, the City of Menlo Park contracted with Cascadia Consulting Group, Inc., and EOA, Inc., (the Project Team) to develop a Strategic Plan that identifies whether existing public containers are sufficiently located in high trash generation areas and are designed properly to manage the common types of trash generated there. The study also identifies priorities for enhanced monitoring programs for public containers in high trash generating areas, and provides recommendations on specialty containers and new container technologies that may prevent litter.

This Strategic Plan will help Menlo Park comply with its Short-Term Plan requirement to develop a strategic plan for public area trash containers by July 1, 2014. Implementation of the Strategic Plan is scheduled to begin July 1, 2014, and continue through July 1, 2017, as part of the City's Long-Term Plan. Recommendations adopted as part of the Strategic Plan are targeted for immediate and/or ongoing trash load reductions and will assist the City in resolving litter issues in high trash generating areas and achieving the 70% and 100% trash load reductions by 2017 and 2022, respectively.

¹ City of Menlo Park. Baseline Trash Load and Short-Term Trash Load Reduction Plan. February 2012.

² BASMAA (Bay Area Stormwater Management Agencies Association). Trash Load Reduction Tracking Method: Technical Report. Prepared by EOA, Inc. February 1, 2012.

City of Los Angeles 2004. Technical Report: Best Management Practices for Implementing the Trash Total Maximum Daily Loads, January 2004. Watershed Protection Division, Department of Public Works, Bureau of Sanitation. Cited in Gordon, M., and R. Zamist. Municipal Best Management Practices for Controlling Trash and Debris in Stormwater and Urban Runoff. 2006.



Methodology

The recommendations in this Strategic Plan were developed based on a field survey to identify and assess all existing public trash and recycling containers in the City. Additionally, the City was surveyed for litter problem areas not currently serviced by a public container. Survey results were analyzed to identify containers most likely to result in litter, particularly in areas associated with high trash load generation. Analysis of field data informed the actions that Menlo Park is recommended to take to reduce litter. This section summarizes the survey and analysis methodology. Additional details on the methodology can be found in Appendix A.

FIELD SURVEY DESIGN AND IMPLEMENTATION

The field survey of public trash and recycling containers involved obtaining an inventory to confirm the number of existing containers, developing a survey plan and tool, and conducting the field research.

To assist in confirming the existing number and locations of containers in public areas, the Project Team used an initial inventory provided by the City's current franchised waste hauler, Recology San Mateo County (Recology) and conducted interviews with City and Recology staff. Appendix B documents an inventory developed in 2008 by Recology as part of the *Franchise Agreement Between the City of Menlo Park and Recology San Mateo*; it also presents an updated version of the original inventory, accounting for containers that have been added or removed.³ Based on the initial inventory provided, it was estimated that the City of Menlo Park had 156 sites with one or more public trash and recycling containers that are accessible for curbside collection by Recology. In addition to these sites, City staff service an unknown number of containers without curbside access, such as containers located in the interior of parks. No inventory was available for the containers serviced by City staff.

Using the initial inventory of existing containers, the Project Team developed a survey plan identifying specific containers and areas to survey and a survey schedule. The detailed survey plan is presented in Appendix C. The Project Team also developed an Excel-based survey tool for use on a handheld tablet to collect data on:

- **Container inventory information** including site address; container type, size, and waste stream (garbage or recycling); paired containers; and service day and provider.
- **Nearby businesses and potential litter sources.**
- **Four key litter factors** (see Appendix A for more details on the rating scales.)
 - **Container fullness rating** on a scale from 1 (less than 25% full) to 5 (more than 100% full).
 - **Presence of litter** within a 15-foot radius on a scale from 1 (two or less pieces of litter ½ inch or larger in size) to 4 (more than 20 pieces 1 inch or larger in size).

³ Franchise Agreement Between City Of Menlo Park and Recology San Mateo County for Recyclable Materials, Organic Materials, and Solid Waste Collection Services. Attachment B. September 22, 2009.



- **Container condition** on a scale from 1 (fully functioning, no damage, clean) to 3 (significantly reduced function or non-functional).
- **Signage condition** for only recycling containers, as no garbage containers were found to have signage, on a scale from 1 (clear, visible, accurate) to 3 (illegible or not present); containers with signs that read only “Recycle” or that did not list all recyclables currently accepted by Recology were given a rating of 2.
- **Percent composition** (using visual approximation based on volume) of garbage, recyclable, and compostable materials; contamination (for recycling containers); and specific materials of interest (single-use foodware, food packaging/wrappers, California Redemption Value [CRV] containers, single-use plastic bags, and cigarette packaging or ends).
- **Other areas of concern and notes** including illegal dumping and notable types of litter.

Field surveys were conducted during July and August of 2013. Containers were surveyed the day before scheduled collection service to best observe trash overflows that contribute to litter. Every site or address on the 2008 inventory provided by Recology was surveyed at least once; some sites had multiple containers. All containers that were located in the initial inventory were surveyed on all the data points listed above, except in the City’s Civic Center. As agreed on with the City, visual composition data was not obtained for 20 garbage and 16 recycling containers at the City’s Civic Center due to the large number of containers. During field research, the Project Team found that some containers had been removed, relocated, or added since the 2008 inventory. Any public containers found during the survey, whether or not they could be linked to a container listed in the Recology inventory, were surveyed. In addition, some containers on the inventory, such as large dumpsters meant for use by private businesses, were not surveyed because they were not publically accessible. A more accurate account of the current inventory based on field research is represented in Appendix D.

DATA ANALYSIS AND RECOMMENDATIONS DEVELOPMENT

Following the field research, survey data were reviewed to identify gaps, inconsistencies, and containers that received poor ratings. Additional field research was conducted to fill data gaps and confirm problems at containers that received a poor combined rating across four key factors related to litter (container fullness, signage condition, container condition, and presence of litter), the poorest rating possible on container fullness or presence of litter, or another noted issue of concern (such as illegal dumping). Signage condition was evaluated for only recycling containers because no garbage containers in Menlo Park were found to have labels.

Data analysis focused on identifying containers with poor ratings across the four key litter factors (a combined litter rating of 11–15 for recycling containers and a combined litter rating of 9–12 for garbage containers) or that received the poorest rating possible in any one factor (such as containers that were more than 100% full or were non-functional). Combined and individual litter ratings for each surveyed container are documented in Appendix D, a spreadsheet database that contains both survey results and recommendations for each problem container or area observed. In addition, the Project Team analyzed the incidence and approximate composition of materials in the containers to identify contamination



issues and diversion opportunities. Volume composition percentages for individual bins were estimated visually to the nearest 5%, in general. When a bin contained a material in a smaller quantity, the material was estimated to compose 1% of the volume.

Surveyed containers locations were reviewed to see if they correlated with the locations of the City's high trash generation areas as shown on the City's trash generation map (see Appendix E). Additionally, high generation areas were observed to confirm whether litter issues were present. The trash generation map assigns each area within the City's jurisdiction a low, medium, or high trash generation rate based on trash generation modeling developed at the regional scale and confirmed via local assessments.⁴

Recommendations for actions to prevent litter were developed for containers with poor litter ratings located in high trash generation areas based on:

- Field study observations.
- Review of best management practices identified by the Bay Area Stormwater Management Agencies Association (BASMAA) and other jurisdictions, including case studies.
- Research on alternative container types and costs.
- Interviews with City and hauler staff.
- Product research with vendors.

Actions were prioritized based on expected litter-reduction benefits and estimated costs and resource needs. Estimated costs and resource needs should be considered planning-level estimates. They are based on conversations with City staff including information on staff salaries, high-level internet research, research with vendors, and the Project Team's professional experience. Staff salary and benefit costs provided by the City are shown in Appendix F. Staff salaries do not include overhead and administrative costs. Salaries provided for 2013 were rounded to the nearest five dollar increment. For cost estimates, salaries were sometimes averaged if multiple staff may be working on implementing the same recommendation. The City should develop additional implementation-level cost estimates before undertaking any of the recommendations presented in this Strategic Plan.

Additionally, methodologies for measuring the direct impacts of control measure adoption on trash load reduction (e.g. gallons reduced) is currently unavailable during the writing of this Strategic Plan for control measures other than full trash capture devices, which assume 100 percent efficacy in litter capture. The upcoming Trash Assessment Strategy Version 2.0 study that is to be performed through BASMAA from 2014 to 2016 will be designed to verify and assess adopted control measures, including public litter container management to meet full trash capture device equivalency. As a Permittee, Menlo Park will work with BASMAA to develop the assessment strategies that will allow for agencies to assign trash load reductions to control measures adopted.

⁴ BASMAA (Bay Area Stormwater Management Agencies Association). Trash Load Reduction Tracking Method: Technical Report. Prepared by EOA, Inc. February 1, 2012.



In the interim, as part of this Strategic Plan the Project Team has identified which TMAs will be impacted depending on the recommendations selected for adoption. Additionally, based on qualitative estimates of benefits, the expertise of the Project Team, and the in-field observations of the litter container study, estimates on the impacts to trash generation levels are provided for the proposed recommendations. It is assumed that recommendations implemented successfully will effectively reduce litter generation and litter entry into the MS4. It is uncertain at this time that recommendations only related to public litter container management would achieve full trash capture equivalency. However, for the areas surrounding containers, recommendations that directly remove or reduce the presence of litter should lower the generation rates for that area. In order to change the generation rate of an entire TMA, other control measures such as enhanced street sweeping or inlet maintenance, additional measures for source control, public education, or other changes to City infrastructure or programs for litter prevention and cleanup may be required in conjunction with litter container management.



Results

During the field study, 330 containers were surveyed, including 240 garbage and 90 recycling containers. The visual composition data was not obtained for 20 garbage and 16 recycling containers at the City's Civic Center due to the large number of containers. Only the data needed to provide an overall litter rating was obtained for these 36 containers, as agreed on with the City. As a result, data on these containers is included in calculations regarding container fullness, nearby litter, container condition, signage condition, and overall litter ratings; however, data on these containers is excluded in calculations regarding waste composition. Key findings from the field observations used to inform the recommendations are described below.

Container Fullness

- A total of 29 garbage containers (12%) and 8 recycling containers (9%) received the poorest rating for fullness, meaning they were found to be overflowing (see Figure 1 and Table 1). Another 31 garbage containers (13%) and 8 recycling containers (9%) were found to be more than three-quarters full, increasing the likelihood of overflow and litter generation before collection.
- In contrast, 58% of garbage containers and 69% of recycling containers were found to be less than half full (a fullness rating of 1 or 2).

Figure 1. Container Fullness Ratings

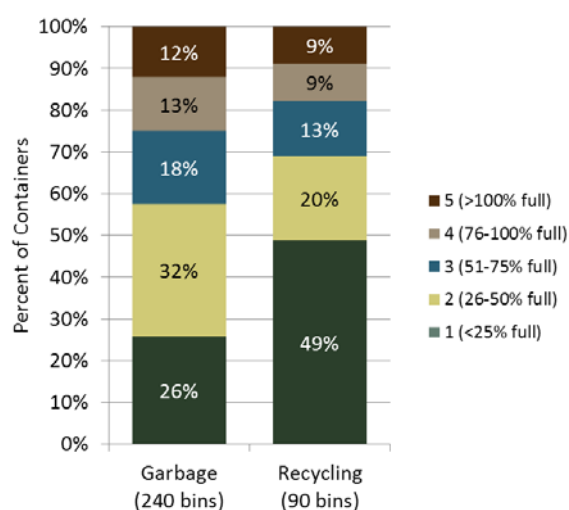
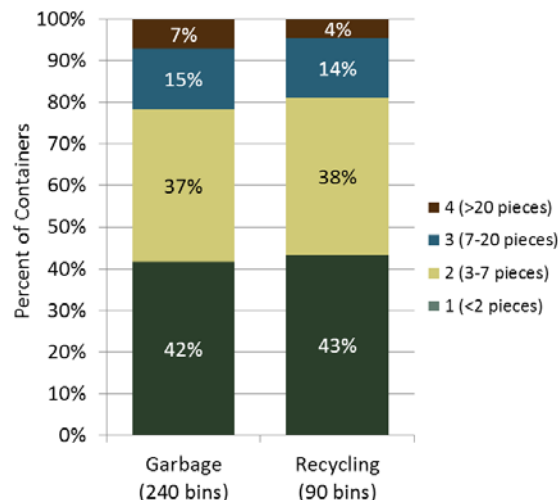


Table 1. Container Fullness Ratings for Surveyed Garbage and Recycling Containers

	1 (<25% full)	2 (26-50% full)	3 (51-75% full)	4 (76-100% full)	5 (>100% full)	Total
Garbage	62	76	42	31	29	240
Recycling	44	18	12	8	8	90


Figure 2. Nearby Litter Ratings


Nearby Litter

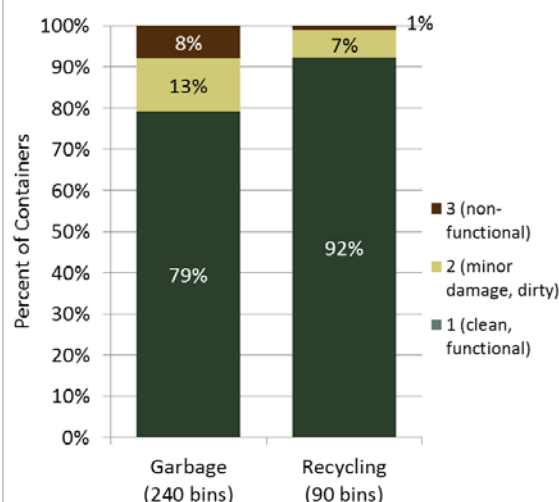
- Overall 17 garbage containers (7%) and 4 recycling containers (4%) were found to have more than 20 pieces of nearby litter—and therefore received the worst litter rating of 4 (see Figure 2 and Table 2). Another 35 garbage containers (15%) and 13 recycling containers (14%) had between 7 and 20 nearby pieces of litter. Common causes included container overflow or damage, such as a missing lid.
- In contrast, more than two fifths of containers—42% of garbage and 43% of recycling bins—had no litter in the surrounding area.

Table 2. Nearby Litter Ratings for Surveyed Garbage and Recycling Containers

	1 (<2 pieces)	2 (3-7 pieces)	3 (7-20 pieces)	4 (>20 pieces)	Total
Garbage	100	88	35	17	240
Recycling	39	34	13	4	90

Container Condition

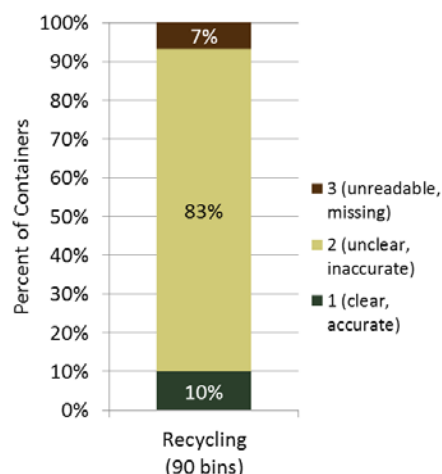
- Most containers were found to be in good condition (see Figure 3 and Table 3). Approximately 79% of garbage containers and 92% of recycling containers received the best rating for being clean and functional.
- However, 19 garbage containers (8%) and one recycling container (1%) received the poorest rating for container condition, indicating reduced functionality that can result in litter issues.

Figure 3. Container Condition Ratings

Table 3. Container Condition Ratings for Surveyed Garbage and Recycling Containers

	1 (clean, functional)	2 (minor damage, dirty)	3 (non-functional)	Total
Garbage	190	31	19	240
Recycling	83	6	1	90



Figure 4. Recycling Signage Condition Rating



Recycling Signage Condition

- The majority of recycling containers (83%) received the middle signage rating because their signs were readable but incomplete (see Figure 4 and Table 4). These signs often read “Recycle” or did not list all the materials accepted by the hauler.
- Only six recycling containers (7%) received the poorest rating for signage condition, indicating a missing or illegible sign, which can lead to recycling contamination.

Table 4. Signage Condition Ratings for Surveyed Recycling Containers

	1 (clear, accurate)	2 (unclear, inaccurate)	3 (unreadable, missing)	Total
Recycling	10%	83%	7%	90

Overall Litter Ratings

For each container, ratings for the four key litter factors (fullness, nearby litter, container condition, and—for recycling containers—signage condition) were summed to create a combined numerical rating. An overall litter grade of A, B, or C—presented in Table 5 (recycling containers) and Table 6 (garbage containers)—was then assigned based on these combined numerical ratings. Containers that received a good combined numerical rating but also received the worst possible rating in any one litter factor were also assigned a “C” grade (see Appendix D for container ratings and grades).

Table 5. Rating Scale for Overall Litter Grade for Recycling Containers

Grade	Rating Scale
A	Score of 4-6: Typically had no or limited presence of litter (e.g. 0-7, 1/2 inch or larger pieces within a 15ft radius), clear and visible signage that may list all recyclable materials, high-functioning/durable container with effective service levels to prevent overflow.
B	Score of 7-10: Typically had moderate litter present (e.g. 3-20, 1 inch or larger pieces within a 15ft radius), signage that may be unclear or not inclusive of all recyclable materials, container with minor or cosmetic damage, service levels are adequate but may contribute to occasional overflow.
C	Score of 11-15: Typically had large amount of litter present (e.g. 20 or more, 1 inch or larger pieces within a 15ft radius), no or illegible signage, damaged container, inadequate service levels resulting in overflow. Also includes any container that received the worst possible rating in any one litter factor, no matter what combined score the container received.

**Table 6. Rating Scale for Overall Litter Grade for Garbage Containers**

Grade	Rating Scale
A	Score of 3-5: Typically had no or limited presence of litter (e.g. 0-7, 1/2 inch or larger pieces w/in 15ft radius), high-functioning/durable container with effective service levels to prevent overflow.
B	Score of 6-8: Typically had moderate litter present (e.g. 3-20, 1 inch or larger pieces w/in 15ft radius), container with minor or cosmetic damage, service levels are adequate but may contribute to occasional overflow.
C	Score of 9-12: Typically had large amount of litter present (e.g. 20 or more, 1 inch or larger pieces w/in 15ft radius), damaged container, inadequate service levels resulting in overflow. Any container that received the worst possible rating in any one litter factor, no matter what combined score the container received.

The distribution of containers by overall litter grade is as follows:

- One-quarter of garbage containers (60 bins) received a C grade, primarily for receiving the highest, meaning worst, possible rating in at least one category (see Table 7). These containers should be prioritized for changes.
- Overall, 120 garbage bins (50%) received an A grade, indicating a low priority for litter-reducing actions.
- One-fifth of recycling containers (19 bins) received a C grade, primarily for receiving the worst possible rating in at least one category. These containers should be prioritized for changes.
- Overall, 39 recycling bins (43%) received an A grade, indicating a low priority for litter-reducing actions.

Table 7. Overall Litter Grades for Garbage and Recycling Containers

	A Grade	B Grade	C Grade	Total
Garbage	120 (50%)	60 (25%)	60 (25%)	240
Recycling	39 (43%)	32 (36%)	19 (21%)	90
Total	159 (48%)	92 (29%)	79 (24%)	330

Percentages may not sum to 100% due to rounding.

Litter Generation Areas

- Of the City's three areas that have high trash generation rates, as shown in Appendix E, two had confirmed high litter levels. One high generation area is located adjacent to a litter problem area but had no litter problem itself (see Table 8).
- The two confirmed sites with litter issues depicted on the trash generation map currently have public litter containers but could use improvements. One of the areas has a container missing a lid and another existing container that should be relocated within the area. The other area contains a private business that has a public container with no issues but has a parking lot with consistent high litter volumes.



Table 8. Locations and Litter Observations of High Trash Generation Areas

TMA Location	Street Location	Observation
3B	Menalto Avenue at Gilbert Avenue	High litter levels were observed at the container at 1919 Menalto due to a missing lid. Existing containers at 1933 are underused and an additional container set (garbage and recycling) is needed on Gilbert Avenue.
3E	Willow Road at Durham Street	Low to no litter issues were observed at this area. However, at the northeast corner opposite this area high litter volumes were observed at the parking lot and public container located at 812 Willow Road (TMA 3A).
4F	Willow Road at Ivy Drive	High litter levels were observed at this private business parking lot located at 1305 Willow Road despite the presence of a public garbage container.

Waste Composition

Calculating overall composition for Menlo Park public containers is not possible because fullness ratings were recorded in wide ranges (less than 25%, 26–50%, 51–75%, 75–100%, and more than 100%) and because containers varied in size. Instead, composition results are presented in terms of incidence and the share of bins that contained a high percentage of key materials.

- **Visual waste characterization found that 98% of garbage containers contained recyclable materials.** For 18% of garbage containers, more than half of the material could have been recycled, indicating strong opportunities for diversion and recovery of valuable recyclables (e.g., CRV). For another 53% of recycling bins, recyclable materials made up between one-quarter and one-half of the total contents.
- **Visual waste characterization found that 96% of recycling containers contained garbage or other contamination.** For 23% of recycling containers, more than half of the material was garbage or compostable material, indicating a strong need to address contamination. For another 43% of recycling containers, contamination made up between one-quarter and one-half of the total contents. Contamination occurred despite approximately 90% of surveyed recycling bins being paired with garbage containers; this strategy tends to reduce contamination, but only if containers are clearly labeled, appropriately sized, and similarly easy to use.
- **Compostable material composed more than half of the materials in 12% of garbage bins and 4% of recycling bins,** presenting an opportunity for diversion in targeted areas.
- **CRV containers were found in 34% of garbage containers, making up less than one-quarter of the total contents in all but four of the containers.**
- **CRV containers were found in 77% of recycling bins.** For 10% of all recycling bins, CRV containers made up more than half of the total contents. For another 14% of recycling bins, CRV containers made up between one-quarter and one-half of the total contents.



- **Single-use plastic bags and cigarette ends were found in very few containers.** About 6% of garbage containers and 1% of recycling containers contained single-use plastic bags. About 5% of garbage containers and 1% of recycling containers contained cigarette ends.
- **Single-use foodware, such as take-out containers and drink cups, were found in more than three-quarters of garbage (77%) and recycling (78%) containers.** For 25% of garbage containers and 32% of recycling containers, this material made up more than one-quarter of the total contents.
- **Food packaging, such as chip bags, were found in 73% of garbage containers and 57% of recycling containers.** For 20% of garbage containers and 12% of recycling containers, this material made up more than one-quarter of the total contents.



Recommendations

Overall, the areas surrounding public garbage and recycling containers in the City of Menlo Park appear to have moderate litter levels, but levels vary by location. More than 40% of surveyed containers had fewer than two pieces of nearby litter compared to 6% of containers that received the poorest rating for having more than 20 pieces of nearby litter. While conducting the survey, field researchers observed large stretches of roadways and small parks that were litter free, particularly in residential areas. In contrast, field researchers noticed that locations such as bus stops, train stations, and large parks appeared more likely to have litter.

Based on the results of the field study, the Project Team has identified seven main opportunities where the City can take action beginning July 1, 2014. The actions are intended to improve public containers that have the potential to generate litter and to assist in achieving trash reduction goals for the MS4 as part of the City's Long-Term Plan.

Recommendations are based on the Project Team's survey of 240 garbage containers and 90 recycling containers. The results of the field study observations and data analysis are specific to this study and the methodology developed by the Project Team. The survey findings on litter problem sites and containers are presented below along with recommendations to address problem sites and containers identified. Recommendations also address several areas that were identified as needing additional containers to address overflow at existing containers or litter at sites that currently have no public container.

Opportunities for action were evaluated and prioritized based on costs and resources needed to implement, focusing on public containers that had confirmed litter issues. Cost estimates for proposed recommendations are presented as planning-level estimates because the Project Team may be unaware of all the City's cost and staff constraints. The City should develop detailed, implementation-level cost estimates before undertaking any of the recommendations presented in this Strategic Plan.

Preliminary trash load reduction estimates were developed based on qualitative estimates of the effectiveness of the recommendations. The Trash Pilot Study, commissioned by BASMAA and scheduled to take place from 2014 to 2016, will develop methodologies for further evaluating and providing quantitative data on trash load reduction for public litter container management.

A previous study divided the City of Menlo Park into several Trash Management Areas (TMAs), and assessed the litter generation characteristics of each TMA. When possible, this Strategic Plan identified the TMAs impacted by each proposed recommendation. The number of containers presented in each TMA is displayed in Table 9. Recommendations such as relocation or adding a new container and container repair in a high litter generation area, or land uses areas identified as having high litter levels, are expected to lower the litter generation rate surrounding the container (not for the entire TMA). For example, a recommendation implemented in a high or moderate trash generation area (red or yellow area) as shown in Appendix E would move to the next lowest generation rate, if not already low (green) on the map.

The detailed list of recommendations and TMA location for containers is presented in Appendix D.



Table 9. Number of Containers per Trash Management Area

TMA ID	Number of Containers
1A	21
1B	10
1C	1
1D	0
2A	80
2B	2
2C	115
3A	24
3B	3
3C	0
3D	15
3E	0
4A	53
4B	0
4C	0
4D	0
4E	6
4F	1

1. RELOCATE EXISTING CONTAINERS

CONTAINER ISSUE

Field research and analysis assessed whether existing containers were in appropriate locations to minimize the amount of litter generated by the public. Several containers were found to be underused and could more effectively prevent litter if they were moved closer to adjacent containers experiencing overflow or to sites currently not serviced by a container, particularly in high generation areas.

RECOMMENDATIONS AND IMPACT TO TMAs

Improving public access to containers and relocating containers to assist in reducing litter from problem areas is recommended through the relocation of eleven containers listed in Table 10. The TMAs impacted by the relocation of the containers are included in Table 10, when specific relocation addresses are provided. Relocation of containers to high litter generating areas will reduce litter generation to moderate to low generation levels. Low litter generation levels of may be assigned to the area surrounding the container if a container issue(s) was the only observed litter source in the area. If other litter issues are present (e.g., failure of pedestrians to properly use litter containers), other control



measures may need to be adopted as part of the Long-Term Plan to achieve the lowest level, or green, generation rate within the area of the TMA being addressed.

Table 10. Proposed Container Relocations

Location	TMA Impacted	Number of Containers	Recommendation
1933 Menalto Avenue	3B	1	Move one of the two containers located in the back parking lot of store to front of complex, away from private bins, for increased use because this area is within one of the City's three high trash generation areas.
683 Santa Cruz Avenue	2C	1	Relocate garbage container approximately 5–10 feet south, directly beside the containers at 693 Santa Cruz Avenue. Despite current proximity, the container does not alleviate overflow issues at 693 Santa Cruz Avenue at its current location.
Caltrain Station	2C	2	Place two of the three 96-gallon recycling carts currently located opposite 1145 Merrill Street closer to problem containers and benches at 1100 and 1090 Merrill Street to help reduce litter and collect the high volume of recyclables such as newspapers.
333 Ravenswood	2A	1	Move garbage container closer to sidewalk and parking lot entrance as it currently sits back too far for easy pedestrian access.
1396 Carlton Avenue	4A	1	Move garbage container closer to corner of Carlton and Hamilton Avenue for increased use.
1399 Willow Road	4A	1	Relocate recycling container from side of store to front of store, adjacent to one of the private garbage containers.
491 Willow Road	3D	2	Relocate recycling and garbage containers to opposite side of bus stop enclosure, closer to the street corner, as they are currently hidden behind the enclosure wall, which may contribute to the high litter levels underneath the enclosure.
Sharon Park on Sharon Park Drive	TBD	2	Relocate stand-alone garbage container opposite playground area to interior of the park on the west side of the pond. Relocate stand-alone garbage container closest to the park, on the corner, for use at a problem site identified in Appendix D, such as 720 Menlo Avenue or 564 Oak Grove Avenue.

ESTIMATED COSTS AND RESOURCE NEEDS

RELOCATE CONTAINERS

Relocating a single container to a nearby location is estimated to require one to four hours of work for one Parks Staff II/III based on an average of the rates provided in Appendix F (with rounding). However, relocation time depends on the container type, condition of the container location, and whether drilling or re-pouring of concrete is necessary. Using the hourly costs for a Parks Staff II/III, relocating containers to a nearby location is estimated to cost \$35 to \$130 per container. Relocating a container to a distant



location would require additional travel time and equipment for transporting the container, including a truck. Relocating existing containers should not affect costs for hauler-provided servicing. To relocate all 11 containers recommended would cost \$365 to \$1,450 for a Parks Staff II/III employee.

TIMELINE

Proposed Recommendation	Timeline
Relocate containers	August 31, 2014

2. UPDATE CONTAINER INVENTORIES

CONTAINER ISSUE

The inventory of containers provided by Recology included account container locations (listed as street names, numerical addresses, or cross streets), waste streams (garbage and recycling), container size, number of units, and collection days. During the survey to verify and assess containers listed in the inventory, field researchers identified a number of discrepancies or potential errors that may reduce the City's ability to manage and accurately monitor public containers to prevent litter. Additionally, the City does not currently have an inventory for the containers serviced by City maintenance staff. The following inventory issues were identified:

- The field survey found only 330 of the containers listed on Recology's original inventory of 476 containers.
- The largest discrepancies in the Recology container inventories were for containers in City parks. Often, containers were found at the parks, but not in the quantity Recology had listed. For example, the Civic Center, including Alma Street, Burgess Drive, Laurel Street, and Ravenswood Avenue, was listed as having a total of 157 containers; however, only 50 containers were found, many of which were interior containers unlikely to be serviced by Recology because they do not have curbside access. Non-curbside containers are serviced by City staff, who empty the public containers into carts that are placed curbside for Recology on or before their day of collection.
- Among all of the containers found, 44 could not be correlated with an address from the Recology inventory because some containers in Recology's inventory were not listed with a street number or cross streets. Some containers may also have been added over time. As a result, it is unclear whether these containers are serviced by Recology or by the City and when collection service occurs.
- Container locations are sometimes duplicated in the Recology inventory. For example, Recology account number 1280940 with the site address provided as 1396 Carlton Ave was found to be the same container as account number 932772 with the site address listed as Carlton and Hamilton. An additional container may have previously been present but removed after the 2008 inventory.



- The City was able to provide service days for interior park containers; however, it is unclear how many containers they service and whether they service containers outside of the parks, such as containers found by field researchers that did not correlate with containers in the Recology inventory.

Information on the discrepancies and newly found containers was reviewed after the field survey and is documented in Appendix D.

In addition to variances in the container counts, the service schedule listed in the inventory did not appear to reflect the current collection schedule for all containers. Some containers were observed on their reported collection day as having the same materials and fullness levels, if not a higher fullness, as shown on their prior survey day, indicating a changed schedule or missed collection. Undocumented schedule changes and missed collections can lead to container overflows, which contribute to litter. At least two observed overflows occurred at containers that also appeared to be missed on their subsequent scheduled collection day. A defined schedule with no missed collections will allow for the City and Recology to accurately monitor problem containers and create efficient routes.

RECOMMENDATIONS AND IMPACT TO TMAs

Having accurate inventories of City staff and Recology serviced containers that reflect the correct public container quantities, locations, and service levels will help the City monitor and manage public containers accurately and efficiently. The following recommendations will help the City and hauler resolve discrepancies in the hauler inventory and ensure accuracy:

- **Encourage or require the hauler to regularly update their inventory of containers** to include container counts and locations verified by field observation, building on the work conducted by this field research, and to reflect changes in container locations, types, and collection schedules.
- **Encourage or require the hauler to perform a route audit** to ensure collection days and route maps are accurate and efficient.
- **Develop an inventory of containers** that are serviced by City maintenance staff, including service schedule and container type. Regularly update any changes to the inventory.
- **Develop a labeling system** to identify which containers are serviced by the hauler and the City. Place an identifying label such as a barcode or color-coded label on each container to identify responsible service provider by City staff monitoring/auditing containers.

Accurate inventories will allow for effective monitoring and service changes in all TMAs by identifying container locations, responsible parties, and expected service levels throughout the city. Inventory updates will support other recommendations that directly prevent and clean up litter.



ESTIMATED COSTS AND RESOURCE NEEDS

UPDATE HAULER INVENTORY

Inventory and schedule updates by the hauler should result in no costs for the City; however, it is not clear what level of inventory information the Franchise Agreement requires the hauler to maintain for City-owned containers. If the update process removes non-existent containers from the inventory, the City could reduce collection costs or could add new containers in place of those nonexistent containers at no additional cost. If the update process identifies containers that are being serviced but are not in the inventory, adding those containers could increase collection costs for the City if the net increase exceeds the annual 5% increase allowed by the Franchise Agreement.

DEVELOP CITY INVENTORY

The City-serviced container inventory, developed starting with the inventory created by this plan, could be created by a City maintenance staff member in the course of a regular collection day, requiring about one extra minute of time for each container for field data collection using either a tablet or paper forms. If the City uses paper forms, additional time would be needed for data entry.

Field data collection using either a tablet or paper forms is estimated to take approximately one hour for a Parks Staff II/III to record City-serviced containers during regular collection, costing approximately \$35.

If paper forms are used, entering field data into a spreadsheet is estimated to cost an additional \$85: approximately half an hour for a Parks Staff II/III (\$15) to oversee four hours of data entry work by an Environmental Programs Temporary Assistant (\$70). This would raise the total cost for developing the inventory to \$120 using paper forms, compared to \$35 using a tablet.

The cost to maintain the inventory will take an Environmental Programs Temporary Assistant using the salary in Appendix F (with rounding) approximately one hour per month, for a yearly cost of \$240.

TIMELINE

Proposed Recommendation	Timeline
Develop an inventory of City-serviced containers	December 31, 2014
Encourage or require the hauler to update inventory of hauler-serviced containers (unless this action requires an amendment to the Franchise Agreement)	July 1, 2015

3. IMPLEMENT INSPECTION AND MONITORING PROGRAM

CONTAINER ISSUE

During the field survey, all containers were observed at least once, with some problem containers or areas observed several times. However, container use (and resulting fullness) fluctuates for a variety of reasons such as season, weather, and special events. This fluctuation makes it difficult to recommend service changes based on a limited number of observations. Field researchers generally observed that



waste and litter generation was higher during special events and on weekends than on weekdays, especially in parks and the downtown area. Container usage may also vary seasonally as the public is more likely to be outside to use public containers in warmer months. Without ongoing monitoring, containers with irregular overflow problems may not be reliably identified and addressed quickly to prevent litter.

RECOMMENDATIONS AND IMPACT TO TMAs

Ongoing monitoring of problem containers or areas will help ensure that appropriate changes are made over time and that changes effectively address overflow problems. Monitoring should target identified problem areas that have been shown to generate high levels of litter. Ideally, City staff would regularly monitor city streets and public containers for litter, overflow, and damage issues while performing other maintenance duties throughout the city.

Specific monitoring recommendations are to:

- **Develop a tracking system** to help document and address damaged containers and chronic problem containers and litter areas. The system could be as simple as a designated employee tracking container issues in an Excel spreadsheet using the updated container inventories.
- **Monitor hauler-serviced containers for overflow and litter issues** that may indicate inadequate scheduling or missed pick-ups; also monitor containers for significant damage. A regularly updated hauler inventory and service schedule will facilitate City monitoring.
- **Encourage the hauler to report containers with consistent litter or overflow problems to the City.** Currently, the hauler reports on broken or damaged containers but not containers that may be contributing litter because of issues such as consistent overflow.
- **Monitor City-collected containers during servicing by City maintenance staff** for overflow and litter issues that may indicate inadequate service levels. Also, monitor containers for significant damage. A regularly updated inventory of City serviced containers will facilitate monitoring.
- **Monitor city streets and parks for litter** to identify new areas that need public collection containers to prevent litter.

Ongoing monitoring for litter problems is recommended within all areas of the City at varying levels. Appendix D documents the recommended monitoring frequency for all identified containers and problem areas. Containers or areas with few litter issues can be monitored as City staff pass by them during other maintenance work, without a formal monitoring schedule. Containers with moderate litter issues are recommended for monitoring once or twice per month.

The areas presented in Table 11 are recommended for prioritized monitoring because field research identified them as consistently generating high levels of litter or having a high probability of generating litter. These areas should be monitored weekly, ideally by a City maintenance staff member who is already visiting these containers or traveling the City regularly, until recommendations for those areas are implemented (see Appendix D) and the litter issue is resolved.



The TMAs impacted are provided for the areas prioritized for monitoring in Table 11. Overall, monitoring will impact TMAs and their litter generation rates city-wide. As problem areas and containers are identified throughout the City, the appropriate recommendation should be implemented to achieve litter reductions in order to lower litter generation rates for the targeted area within a TMA.

Table 11. Containers or Areas Recommended for Prioritized Monitoring

Location	TMA Impacted	Number of Containers	Issue
693 Santa Cruz Avenue	2C	2	Two single-serve food establishments present, resulting in consistent container overflow and litter generation.
735 Santa Cruz Avenue	2C	2	Consistent overflow resulting in litter.
846 Santa Cruz Avenue	2C	1	Single-serve food establishment present, resulting in consistent container overflow and litter generation.
1000-1010 University Avenue	2C	2	Consistently high litter levels observed on sidewalks and parking lot, despite the presence of public and private bins.
1000 Evelyn Street	2C	1	Occasional overflows resulting in high litter levels.
564 Oak Grove Avenue	2C	2 (private containers)	Monitor the area as there is consistent street and parking lot litter despite two private containers.
Civic Center	2C and 4A	32	Picnic areas, skateboard park, small playground (Burgess Drive), baseball field bleachers, and basketball courts regularly had high volumes of litter, especially on the weekends when container overflow was common.
1919-1933 Menalto Avenue	3B	3	Missing lid at 1919 Menalto contributes to high litter volume. High litter volumes observed along Menalto Avenue and Gilbert Avenue. (This is a high trash generation shown in Appendix E.)
Willow Road & Newbridge Street	4A and 4C	9	High litter levels despite public containers on three of the four street corners, particularly at the 1201 Willow Rd market and along Pierce Rd.
812, 850, and 900 Willow Road	3A	4	Consistent overflow and high litter levels observed, especially in business parking lots. (812 Willow Road is adjacent to a high trash generation area (TMA 3E) shown in Appendix E.)
1305 Willow Road	4F	1	Market parking lot has consistent high litter levels. (This is a high trash generation area shown in Appendix E.)
Willow Road at Hamilton Avenue, Hamilton Avenue at Carlton Avenue	4A	5	Gas station and fast-food establishment produce consistent high litter levels, especially on Hamilton Avenue where two large storm drains are present.
Fremont Park on Santa Cruz Avenue	2C	9	Consistently high container volumes, especially recycling containers on the weekends.
Caltrain Station at Alma Avenue and Merrill Street	2C	27	Parking stalls, platforms, and benches have consistently high litter levels and regular overflow from containers at 1145 and 1090 Merrill Street.
491 Willow Avenue at Coleman Avenue	3D	2	Bus stop with consistent overflow and high litter levels in vegetation and surrounding bench.
El Camino Real at Creek Drive	2A	1	Consistent overflows and illegal dumping, especially on weekends; directly above creek.



ESTIMATED COSTS AND RESOURCE NEEDS

CITY MONITORING

The costs to monitor hauler-serviced containers can be scaled to City resources. Based on the time spent on field research during this current study, a complete audit of all hauler-serviced containers for litter, overflow, and damage would take one Parks II/III employee approximately 30 hours at a minimum cost of \$990, not including travel time and additional reporting if required. An audit of only the 16 high-priority areas, encompassing approximately 100 containers, identified in Table 11 would take one employee approximately 4 to 8 hours, at a staff cost of \$130 to \$265, not including travel time and reporting, if required. These costs may be reduced if Parks Staff II/III employees are able to conduct monitoring as part of their regular work while traveling throughout the City. Depending on the number of containers audited (16 to 330) the total cost range to perform an audit is \$130 to \$990.

Developing a simple Excel-based tracking system for problem containers or areas and corrective actions is estimated to take an Environmental Programs Specialist approximately two to four hours to create, for a total cost of \$60 to \$115. Depending on the number of problem containers that City maintenance staff report, the database is estimated to require an Environmental Programs Temporary Assistant one hour per month to maintain, for a yearly cost of \$240. The City may be able to reduce costs by maintaining this database when updating the container inventory in Recommendation 2.

HAULER LITTER REPORTING

The hauler is currently required to report on damaged containers but not on litter or overflow issues. Consequently, reporting on litter or overflow should be easy to perform in conjunction with the current reporting, but the hauler may require an amendment to the Franchise Agreement to add this reporting to their services. According to the hauler, any amendment changes and associated cost changes would have to be evaluated on a case-by-case basis by the City and hauler.

TIMELINE

Proposed Recommendation	Timeline
Develop a tracking and reporting system to support monitoring	December 31, 2014
Begin monitoring City-serviced containers	January 1, 2015
Encourage hauler to report containers with litter or overflow problems	August 31, 2014
Begin monitoring city streets and parks for areas that need new containers	January 1, 2015
Begin auditing hauler-serviced containers	January 1, 2015



4. INCREASE LITTER CLEANUP

CONTAINER ISSUE

Whether because of overflow or direct littering by the public, 58% of public containers surveyed had three or more pieces of litter present within a fifteen foot radius of the container, such as containers pictured in Figure 5 and Figure 6. Field researchers observed that the most commonly littered items appeared to be cigarette ends and single-serve foodware, such as paper beverage and food cups.

Figure 5. Garbage Container Overflow in Downtown Area



Figure 6. Recycling Container Overflow in Downtown Area

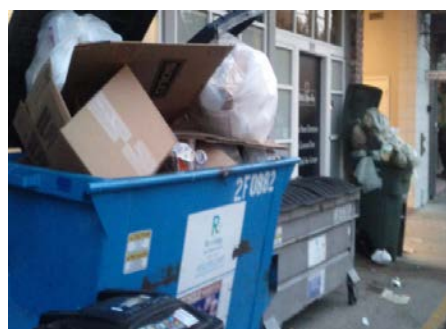


Field researchers noticed that the parking lots and alleys of many private businesses often have high litter levels. Additionally, train stations and bus stops were also noted as having high litter levels, even when public containers were available, supporting the findings of previous research that shows transit sites tend to have high litter levels.⁵ Caltrain parking stalls on the Alma Street side, in particular, were noted as having high litter levels. Field researchers observed litter in parking lots occurring as a result of individuals deliberately littering (e.g., cigarette ends), accidental littering from vehicles and pedestrians, and overflowing waste from public containers and private business dumpsters (see Figure 7 and Figure 8). Despite current street sweeping and cleanup efforts, field researchers noticed that the majority of the City's storm drains contained litter.

Figure 7. Litter in Parking Stalls



Figure 8. Litter from Overflowing Dumpsters



⁵ Keep America Beautiful. Littering Behavior in America: Results of a National Study. Prepared by Action Research. 2009.



Current street sweeping levels vary by street type (i.e., residential or commercial) and season, with the downtown area receiving the highest frequency of street sweeping at two times per week. Additionally, the street sweeping program includes sweeping the parking lots of the downtown area behind businesses and City facilities, including parks, once per week. However, street sweeping alone does not appear sufficient because litter becomes caught in places the sweeper cannot reach, such as in vegetation and planters, under benches, alongside waste containers and dumpsters, and against parking stall barriers. Field researchers noticed large amounts of litter present in some parking lots the day following scheduled sweeping, especially in the downtown area. While City staff are responsible for cleaning up litter within City parks and facilities, there is no known regular cleanup of litter on sidewalks or vegetated areas outside of these facilities.

The current hauler Franchise Agreement requires the hauler to pick up abandoned waste or illegal dumping, but does not include the cleanup of litter or implementation of other litter abatement activities.⁶ In addition, collection activities may actually contribute to litter. For example, trash observed in a container prior to the day of collection (see Figure 9) was found as litter following collection (see Figure 10).

Figure 9. Trash Observed in Container Prior to Collection



Figure 10. Trash from Container Observed as Litter Following Collection by Hauler



RECOMMENDATIONS AND IMPACT TO TMAs

Cleaning up litter from streets, parking lots, alleys, sidewalks, vegetation, and other open areas before it reaches the storm drain is an effective way to reduce the trash loads to the MS4. The City is recommended to undertake the following actions to improve litter cleanup:

- **Consider implementing hand sweeping or obtaining alternative vacuuming equipment** to clean areas that cannot be accessed by a street sweeper, such as behind parking barriers, in street corners, and along alleys. Cities such as Campbell and Santa Cruz, California, and Chicago, Illinois, have implemented weekly hand sweeping to access parking stalls, street corners, and sidewalks that cannot be accessed by a street sweeper.

⁶ Franchise Agreement Between City Of Menlo Park and Recology San Mateo County for Recyclable Materials, Organic Materials, and Solid Waste Collection Services. Attachment B. September 22, 2009.



- **Avoid the use of blow equipment**, such as leaf blowers, in the areas that have litter present as this action can cause litter to enter the storm drain. If blowers must be used, blow towards vegetation or cover storm drains. During field research, a maintenance staff member was observed using a leaf blower at the Caltrain station, causing litter to enter the gutter that leads to the storm drain. Additionally, a researcher was approached by a Menlo Park resident who said City maintenance staff blow leaves and litter from Wilson Park, along the entry pathway that connects to Gilbert Avenue, to the street, when they should be blowing toward the park.
- **Increase litter cleanup activities by City maintenance staff** to include litter cleanup from City sidewalks surrounding the public containers in areas being monitored for confirmed overflow and high litter levels. In addition, work with Caltrain and SamTrans to determine responsibilities for cleaning up litter at train and bus stops with containers not serviced by the City. In the long term, the City may explore amending the hauler Franchise Agreement to include litter cleanup within a 15-foot radius during container servicing.
- **Conduct outreach to businesses and property owners**, including non-City public agencies, on City codes requiring them to clean up litter from adjacent sidewalks and clean parking lots and other paved areas in a manner that does not discharge pollutants to storm drains (Menlo Park Municipal Code 7.42.120). Outreach should also address litter prevention requirements such as keeping garbage containers tightly covered and providing adequately large containers (Menlo Park Municipal Code 7.04.030). In the long term, the City may explore expanding its inspection program to monitor privately owned parking lots and dumpsters for litter and overflow, conducting enforcement activities for chronic violators.

Improvements to litter cleanup programs will improve TMAs city-wide by reducing the amount of litter available to enter the MS4. The main TMAs impacted will be the downtown area and Caltrain station located in TMA 2C as well as TMAs that include businesses, transit areas, parks, or other sites with litter issues such as 3D, 3E, and 4F.

ESTIMATED COSTS AND RESOURCE NEEDS

CITY STAFF LITTER CLEANUP

The Project Team was not able to obtain a cost estimate for hand sweeping of high priority areas. Maintenance staff in the City of Campbell, California, anecdotally reported that the practice does not substantially add to their regular duties, therefore minimal to no impact to routine maintenance costs is predicted.⁷ According to the City of Menlo Park's Parks and Trees Supervisor, the City could purchase a commercial grade walk behind sweeper at a cost of \$4,500 to \$7,000.⁸

⁷ Personal communication with Public Works Street Maintenance staff members from the City of Campbell, California. July 2013.

⁸ Personal communication with Parks and Trees Supervisor from the City of Menlo Park, December 2013.



Increased litter cleanup at containers serviced by City maintenance staff could add less than 30 seconds for the 42% of containers with fewer than two pieces of litter and up to three minutes for the 6% of containers with more than twenty pieces of litter. Based on the presence of litter at surveyed containers, the Project Team estimates that cleaning up litter at City-serviced containers would add approximately an average of one minute of work per container at a Parks Staff II/III employee cost of \$0.60 per container. An estimated 130 containers are serviced by the City based on their proximity to the curb being greater than five feet, as shown in Appendix D, as the hauler only services containers within five feet of curb. However, the hauler listed many of these containers on its inventory therefore, this count will likely be adjusted when the inventory count is resolved as part of Recommendation 2. In the meantime, cleanup at 130 City-serviced containers would cost the City approximately \$145 per week based on the Parks Departments current practice of twice weekly container collection, resulting in an annual cost of \$1,715.

LITTER CLEANUP PARTNERSHIPS

Depending on the amount of time required to come to an agreement, working with Caltrain and SamTrans to determine responsibilities for litter cleanup at their stations and stops could take 8 to 24 hours for communication, documentation, and meetings. Costs estimates were developed assuming the hours would be divided evenly between an Environmental Specialist and the Environmental Programs Manager, for a total cost of \$300 to \$900. Significant negotiations would require more time and involvement of senior level staff.

LITTER OUTREACH

The staff time and expenses for conducting outreach to the City will vary based on the type and level of outreach conducted and the number of businesses that must be reached. For example, a letter mailer sent to approximately 800 businesses is estimated to cost about \$500 to \$2,000 to design (depending on design complexity and if a design firm is used), \$600 to print, and \$400 for postage. Staff time to create an outreach letter and flyer for the mailer would take approximately one to two hours using an Environmental Programs Specialist or Temporary Assistant at a cost range of \$25 to \$50. The total cost range to develop a mailer is estimated at \$1,525 to \$3,050.

Door-to-door outreach would cost substantially more for additional staff time (likely at the Environmental Programs Temporary Assistant rate) and development of outreach materials, especially if an outside design firm is contracted to create posters and flyers.



TIMELINE

Proposed Recommendation	Timeline
City maintenance staff to pick up all litter around City-serviced public containers.	August 31, 2014
Request meetings with transit organizations to determine responsibilities for litter cleanup at transit sites.	July 1, 2016
For transit sites the City is responsible for, begin weekly litter cleanups as soon as practical given existing contracts and franchise agreements.	August 31, 2014
Begin outreach to businesses with parking lots.	July 1, 2015
Implement hand-sweeping, if selected.	July 1, 2015
Implement commercial sweeping equipment, if selected.	July 1, 2015

5. REPAIR DAMAGED CONTAINERS AND IMPROVE SIGNAGE

CONTAINER ISSUE

Damaged containers can contribute to litter in several ways. Missing or broken doors that prevent locking the bins securely inside the containers aid scavenging by pedestrians or wildlife. Missing lids can create windblown litter and expose trash to scavenging wildlife—especially birds—that will remove trash from open bins. This issue was witnessed at several locations with missing lids during the field survey (see Figure 11).

Figure 11. Scavenging Wildlife Creating Litter at a Container Missing its Lid



Overall, 20 surveyed containers were non-functional or had significantly reduced function. Among surveyed containers, garbage containers were slightly more likely to be *more* than three-quarters full, and recycling containers were much more likely to be *less* than one-quarter full. Poorly labeled recycling containers may cause individuals to place recyclable materials in already full garbage containers, contributing to overflow.

Almost all garbage containers (98%) contained some amount of recyclable materials. For 18% of garbage bins, more than half of the material could have been recycled, indicating a strong diversion and recovery opportunity for recyclables.

Almost all recycling containers (96%) also had some level of contamination, meaning non-recyclable materials were present. For 23% of recycling bins, more than half of the material was garbage or compostable material, indicating a strong need to address contamination. Garbage, particularly pet waste in parks, was found in recycling containers, even when adjacent to a garbage container.



In Menlo Park, 83% of surveyed recycling containers were labeled in the form of lids with stickers or engraving saying “Recycling” or “Cans, Glass Bottles, Plastic Bottles” (see Figure 12 and Figure 13). A small percentage of recycling containers had no written labels and were simply color-coded blue. Only carts provided by Recology had signage for single-stream recycling that listed all the materials the hauler currently accepts. Field researchers noticed that recyclable paper products such as newspapers and shopping bags

Figure 12. Recycling Container Signage Accepting Limited Recyclables



Figure 13. Impaired Recycling Container Signage Accepting Limited Recyclables



appeared to contribute substantially to container overflow in garbage containers. Advertising all acceptable recyclables on recycling containers can help shift recyclable materials from garbage to recycling containers, which tend to be less full on average. (Ensuring garbage and recycling containers are always paired can also reduce garbage overflow; see Recommendation 6.) Additionally, single-serve paper cups, such as coffee and soda cups, were observed in large quantities in recycling containers, which due to food contamination are likely not recyclable. Ensuring clear and consistent signage for recycling containers is important for avoiding contamination of the recycling stream.

RECOMMENDATIONS AND IMPACT TO TMAs

It is recommended that the City undertake the following actions to repair damaged containers and improve signage to reduce litter and overflow:

- Replace or install 24 missing container lids to prevent wildlife and wind from removing material in the containers and causing litter.
- Repair or replace 2 container doors to ensure internal bins are securely locked in containers and have tightly closing lids.
- Replace or install signs on 23 recycling containers to ensure they are legible.
- Consider adding signage to the garbage containers with a message such as “garbage only—no recyclables.” Garbage containers with these signs should always be paired with a recycling container, as described in Recommendation 6.
- Consider repair or replacement of 35 containers or container lids with minor or cosmetic damage that does not reduce container function (e.g., graffiti, rust, cracked lids) to encourage the use of containers by the public and avoid more cost intensive repairs in the future.

The detailed list of containers for which changes are recommended is documented in Appendix D.



In the long-term, the City should consider ensuring signs on recycling containers list all accepted recyclable materials. Listing all accepted recyclable materials is considered a long-term action because it would also require installing larger recycling containers in the downtown area to accommodate the increased recycling.

Improved signage should be consistent throughout the entire City, meaning the same signage should be adopted throughout the City to avoid confusion at different container types. Signage should be standardized and contain symbols for recycling and garbage—and organics, if adopted in the future. Vermont has introduced state-wide signage symbols for garbage, recycling, and food scraps (shown in Figure 14) to support its Universal Recycling Law (Act 148,) which bans all recyclables from landfill by 2015 and all food scraps by 2022.⁹ These symbols are to be used by businesses, solid waste management entities including haulers, schools, and anywhere else where materials are source separated. Vermont modeled its universal signage after programs in San Francisco and Seattle that use similar symbols.

Figure 14. Vermont Universal Signage for Recycling, Food Scraps, and Garbage



In addition, to symbols for garbage, recycling, or organics, photo images or other symbols to show accepted materials are helpful to avoid contamination between containers. The existing signage available for carts from Recology for garbage and recycling containers provides some images that may help users identify recyclable items as shown in Figure 15. The City should examine opportunities to use and develop new signage with Recology to ensure consistency among container labels.

Figure 15. Recology Recycling Label



⁹ Vermont's Agency of Natural Resources (ANR). Universal Recycling Symbols. <http://www.anr.state.vt.us/dec/wastediv/solid/urs/>. Accessed December 2013.



The City of San Francisco provides a Signmaker tool for businesses, schools, and residents that allows for stock photos of the most commonly generated items to be added to a sign for free printing by the City. Signs have minimal text, with a focus on the sample photos, as shown in Figure 16. The City should provide signage with photos or symbols of the most commonly littered items in the area where containers are located. For example, single-use cups and cigarette end images should be used in the downtown area and pizza box and single-use foodware images should be used on containers located near park picnic tables. Keep America Beautiful also recommends that container labels clearly list or picture prohibited items that commonly contaminate recycling containers (such as polystyrene cups and pet waste in parks), as shown in the Recology label in

Figure 15 and Figure 17.¹⁰

Figure 16. City of San Francisco Signage



Replacing or installing the 24 missing lids is expected to have the greatest litter reduction effect among the recommended container improvements because missing lids lead to windblown and scavenger-created litter. The TMAs with containers that are missing lids that are already not in a low, or green, generation area, will likely move to a lower (green) generation rate, in the area surrounding the container with the addition of a lid. The TMAs with containers areas that may be improved with the addition of a new or repaired lid include 1B, 2A, 2C, 3A, 3B, 3D, and 4A. Improvements to container signage will likely affect TMAs city-wide as signage is added to new and existing containers throughout the city to reduce litter generation and improve material collection.

Figure 17. Signage Showing Prohibited Items



¹⁰ Keep America Beautiful. Planning for Success: Ten Tips for Designing Public Space Recycling Programs. November 2013.



ESTIMATED COSTS AND RESOURCE NEEDS

CONTAINER REPAIR

Twenty-six (26) containers need lids or other significant repairs (e.g. door replacement). The material cost for the most common types of garbage and recycling containers that were missing lids ranges from approximately \$130 to \$180 per lid, based on the city's current vendor prices, plus a 30% tax and freight expense. Parks Supervisor and Parks Staff II/III time to purchase and install twenty-four lids is estimated to require 30 to 60 minutes of work per container. In total, each container is estimated to cost \$20 to \$35 to purchase and repair, for a total cost of \$4,490 to \$6,480 including tax and freight, for all 24 containers missing lids.

CONTAINER SIGNAGE

Sticker-type labels are estimated to range in price from \$0.50 to \$4.25 each, as shown by a brief internet search. Per the current Franchise Agreement, Recology will provide free stickers for any containers they issue. The City may also be able to purchase labels through Recology, which would ensure recycling labels are consistent throughout the City. The City could also consider hiring a design firm to create new, high-quality signage, closer to the \$4.25 manufacturing cost per sticker.

Selecting and purchasing container labels is estimated to take an Environmental Programs Specialist one to five hours, depending on the level of approval needed to change City container aesthetics. At the Environmental Specialist staff rate this would cost \$30 to \$145 in staff time. The installation of labels is estimated to take five to ten minutes per container when minimal cleaning of the lid is required to adhere the sticker and no existing label needs to be removed. Containers with existing labels that are in poor condition (i.e., partly worn away and strong adhesives were used previously), such as the downtown recycling containers, would require more time. If all 330 containers surveyed, excluding any new containers recommended in Recommendation 6, required new or updated signage at approximately 10 minutes per container, replacing labels would cost \$1,815 using Parks Staff II/III employees. The total cost range estimate to purchase and install labels is \$1,845 to \$1,965.

TIMELINE

Proposed Recommendation	Timeline
Repair damaged bins and replace missing lids.	August 31, 2014
Add labels to recycling containers that have no or illegible signage. Add "garbage only—no recyclables" labels to garbage containers that are paired with recycling bins	December 31, 2014 or when new recycling containers are installed.



6. ADD NEW CONTAINERS OR CHANGE CONTAINER TYPES

CONTAINER ISSUE

Surveying identified 24 locations that need new containers because the existing container is not sufficient or the litter-generating location lacked a container. Existing containers may be insufficient due to small capacity or a small opening that does not accommodate large items generated nearby (such as pizza boxes or wide-rim cups). In addition, some existing garbage containers are not paired with a recycling container, and some recycling containers are not paired with a garbage container, contributing to contamination. Garbage containers surveyed in Menlo Park greatly outnumbered recycling containers.

Currently, the downtown area of Menlo Park uses estimated 20-gallon recycling containers, (container Type B shown in Appendix G) with narrow openings that are too small for some of the materials generated in the downtown area, such as wide-rim cups. Although limited overflow was observed from recycling containers, field researchers noticed materials such as wide-rim cups often blocking the opening (see Figure 18), which could result in materials being stacked on the container or contributing to litter elsewhere by preventing disposal of materials.

Figure 18. Cup Blocking Container Opening



In some areas where garbage cans overflowed, adding a recycling container to divert recyclable materials, adding a new garbage container nearby, or replacing the container with a larger size is recommended. Additionally, the small size of recycling containers in the downtown area limits the amount of material the container can accept from adjacent downtown garbage cans that are often found to be overflowing—often with recyclable materials included in the garbage.



Surveying indicated that additional containers are needed at public parks and facilities, particularly the City's Civic Center and Willow Road Park, where large volumes of litter and large-sized trash such as pizza and beverage boxes are generated (see Figure 19 and Figure 20). Field researchers observed that additional Recology carts were sometimes placed adjacent to the smaller public containers at the Civic Center picnic area on weekends, but even more containers were needed to prevent overflow and litter.

Figure 19. Littered Pizza Box too Large for Existing Container



Figure 20. Littered Beverage Boxes too Large for Existing Container



The primary TMA impacted by recommendations for new or improved containers will be the downtown area, TMA 2C, due to the abundance of recycling containers recommended for improvements. The Civic Center containers included in TMAs 2C and 2A will also be impacted. If implemented, these changes will likely reduce the litter generation to the next lowest level (e.g. yellow to green) in the area surrounding the container within the TMA. Additional recommendations for containers throughout the City and improved design will impact TMAs city-wide.

RECOMMENDATIONS AND IMPACT TO TMAs

The City is recommended to undertake the following actions to add or upgrade containers in order to reduce litter and overflow:

- Install public containers in 24 areas that do not currently have containers or that have existing containers insufficient to prevent litter problems. The detailed list of areas needing containers is documented in Appendix D.
- Add new recycling containers to every unpaired garbage container city-wide as recommended in Appendix D (approximately 135 containers) to help reduce overflow from garbage cans and increase the recovery of recyclables. Containers should have signs that list all the materials accepted by the hauler (Recommendation 5).
- In the downtown area (TMA 2C) new containers should be at least as large as existing garbage containers (typically 32 gallons) and have a large opening that can accommodate all accepted materials unlike the existing containers (estimated 20 gallons).
- If possible, upgrade or replace the hinged metal lids on recycling containers in the downtown area to enlarge the opening.
- To address overflow issues at the Civic Center picnic area (TMAs 2C and 2A) and Willow Road Park (TMA 3D), place Recology carts adjacent to existing containers at the beginning of every



weekend. The Civic Center needs at least four sets (garbage and recycling) of containers in the picnic area on weekends. Willow Park needs at least one 96-gallon garbage cart located at the container closest to the playground main entrance.

The recommendation to replace the existing downtown recycling containers with larger containers that have a large opening will likely be a longer-term action. Larger containers would support the long-term recommendation to list the full set of accepted materials on all recycling containers. More complete signage is expected to increase the amount of material recycled and could cause smaller containers to overflow on weekends without additional collection service.

ESTIMATED COSTS AND RESOURCE NEEDS

INSTALL NEW OR REDESIGN CONTAINERS

The cost to purchase new bins, including the internal container and lid, is estimated at \$1,450.00 per container, based on the City's current vendor prices. Costs may be reduced by using containers proposed for relocation (see Recommendation 1) or by purchasing them in bulk. Installing a new container is estimated to require two hours of work for one Parks Staff II/III employee at a cost of \$70. The total cost to purchase and install a new container is estimated at \$1,520.

The cost to enlarge container openings may be moderate if the City has the equipment to enlarge the metal opening already. To enlarge the 18 recycling containers (Type B) in the downtown area is estimated to take a Parks Staff II/III employee thirty minutes per container at a cost of \$15 per container or \$300 for all the containers. If the City does not have the existing equipment to enlarge the lids or it would be too resource intensive, the City may choose to replace the recycling containers with a new container at the cost above.

Adding containers may increase hauler costs for servicing; however, the hauler inventory update (Recommendation 2) may remove non-existent bins from the list and result in no net change in the service level even with new containers. In addition, the Franchise Agreement allows the City to increase the number of containers serviced by 5% of the total inventory per year at no additional cost. Based on a conversation with Recology, these additional containers can include the provision of more 96-gallon carts. To the City's knowledge it has not implemented this provision of the Franchise Agreement to date.

Adding more and larger bins may also reduce City costs for litter cleanup and may reduce the need to increase the frequency (and thus cost) of hauler service over time.

TIMELINE

Proposed Recommendation	Timeline
Install new public containers, add recycling containers, and place Recology carts on weekends in high-litter-generation areas.	July 1, 2015
Upgrade or replace the hinged, metal lids on recycling containers in the downtown area to enlarge the opening. If this action would require replacing containers or substantial costs, delay implementation as needed.	July 1, 2016



7. IMPLEMENT SPECIALTY BINS AND CONSIDER NEW TECHNOLOGIES

CONTAINER ISSUE

As part of this Strategic Plan, the City requested that the survey and research include recommendations for implementing specialty bins or new technologies to:

- Capture specific items such as cigarette ends and sharps.
- Increase the recovery of bottles and cans for recycling.
- Help reduce the amount of litter generated.

Although no sharps were found as litter, cigarette ends were found at almost every public container or newly identified high generation litter area. Field researchers observed cigarette ends often directly on or adjacent to the containers (see Figure 21) as well as on sidewalks and in planters, parking stalls, and storm drains. Field researchers identified a relatively small number of containers with cigarette receptacles, most of which were serviced by private businesses.

Figure 21. Cigarette Ends on a Garbage Bin



This study did not identify a substantial difference in the share of California Redemption Value (CRV) containers or recyclable materials in general that were present in garbage containers paired and unpaired with recycling containers. However, previous research has concluded that the public will not seek out recycling bins if none are immediately visible and that illegal scavenging of CRV containers can reduce the number of containers recovered through public bins.¹¹ The locks on many of the City's existing recycling containers are not used, allowing scavengers to access the materials easily.

Container overflow issues were most often observed for garbage and recycling containers on weekends, particularly in the downtown area and parks. No collection service is typically available in these areas on the weekend, although a small number of Recology carts are added to the interior areas of the Civic Center on weekends, in varying quantities. The downtown area and parks have more visitors on the weekend, which results in extra garbage and recycling that exceeds the current collection frequency. In addition, field researchers noticed specialty items such as pizza boxes, beverage boxes (e.g., beer and soda), large alcohol bottles, and other bulky items that do not fit in the openings of the existing containers seemed to be more likely to be generated on the weekend. The City requested that the Project Team evaluate the option of using a solar compactor system to address overflow issues such as these.

¹¹ Keep America Beautiful. Littering Behavior in America: Results of a National Study. Prepared by Action Research. 2009.

California Department of Conservation. California Beverage Container Recycling and Litter Reduction Study. P. Berck, G. Goldman. 2003.



RECOMMENDATIONS AND IMPACT TO TMAs

CIGARETTE LITTER

To better capture cigarette litter, it is recommended that the City install specialty bins that are clearly meant for cigarette litter, that are designed to capture burning materials, and that are very easy to use. When selecting and installing these specialty containers, the City should:

- **Install receptacles in high-volume pedestrian areas** shown to generate high levels of cigarette ends, such as street corners in the downtown area and bus stops in TMA 2C and throughout the city.
- **Provide visible, clearly labeled cigarette receptacles in areas where smokers congregate**, such as transit stations and stops. Research has shown that smokers are more likely to use receptacles if they are visible and that each additional receptacle reduces the littering rate for cigarette ends by 9%.¹²
- **Use closed cigarette container receptacles** with a lid or slot for cigarette ends (such as in Figure 22) instead of open receptacles (such as in Figure 23) to prevent windblown litter.

Figure 22. Receptacle with Limited Opening to Prevent Litter



Figure 23. Open Receptacle that Can Contribute to Litter



Figure 24. Example Cigarette Receptacle in Menlo Park



- **Consider using garbage containers with enclosed cigarette receptacles** in the lid to save space compared to using dedicated cigarette receptacles. While many of the existing garbage containers (see Type C shown in Appendix G) can be retrofitted with lids that have cigarette receptacles built in; these receptacles are not recommended because they are the open type that can create windblown litter. A good example of the recommended type of enclosed

¹² Keep America Beautiful. Littering Behavior in America: Results of a National Study. Prepared by Action Research. 2009.

Keep Britain Tidy. No Butts: Smoking-Related Litter. Prepared by ENCAM. March 2008.



container was found at the Safeway at 325 Sharon Park Drive; this privately owned container has a hinged lid attached to the plastic lid of a concrete garbage container (see Figure 24).

Providing cigarette receptacles in TMAs with high pedestrian volumes such as the downtown area, TMA 2C, and at transit areas such as the Caltrain Station (TMA 2C) and bus stops city-wide will aid in reducing cigarette ends entering the MS4. In the long-term, the City should consider implementing a public outreach campaign regarding the negative impacts of cigarette litter as well as working with businesses to provide cigarette receptacles and prohibiting cigarette litter through regulatory action such as litter ordinances or fees. Included below are several case studies of cities that have adopted public outreach campaigns or other efforts to reduce or resolve cigarette litter.

Cigarette Eater Meter: San Rafael, CA

In 2013 San Rafael Clean (SRC), a coalition of local agencies and volunteers, installed a “Cigarette Eater Meter” in the City plaza to encourage the collection of cigarette ends and prevent them from being littered. As pictured in Figure 25, the display showed the pathway cigarette ends take when deposited as litter to the waterways. For every cigarette end collected via the meter, an anonymous donor donated \$0.02 to charity. After about a three month campaign, approximately 100,000 cigarette ends were collected and a \$2,000 check was presented to St. Vincent de Paul Society in San Rafael. The meter display was paired with an opening ceremony and with website and flyer outreach to residents and businesses to promote the campaign. Collected cigarettes were sent to TerraCycle to be recycled into new products such as pallets and cigarette receptacles. The “Cigarette Meter Eater” is available for campaigns in other Bay Area cities through the City of San Rafael.

Figure 25. Cigarette Eater Meter



In 2012 SRC also ran a “Bounty for Butts” campaign where St. Vincent de Paul diners were invited to participate in a “buy-back” program for cigarette ends. Participants were provided bags, gloves, and instructions and received one dollar for every ounce of dry, bagged cigarette ends turned in. Over the two month program 238,000 cigarette ends were collected. St. Vincent de Paul contributed all the staff time and program coordination, and funding was provided by San Rafael businesses.



Additionally, the SRC has a mascot, Oscar the Bulldog, that uses the campaign slogan, “Oscar says... ‘Don’t Trash San Rafael—Put Your Butts in the Can.’” In 2012, volunteers distributed approximately 20,000 of the coasters shown in Figure 26 to bars and restaurants to encourage patrons to dispose of cigarette ends properly. The coasters were designed, printed, and distributed by volunteers with funding support from businesses and the Marin County Stormwater Pollution Prevention Program (MCSTOPPP).

Figure 26. San Rafael Clean Anti-Cigarette Litter Mascot



The success of San Rafael’s public outreach campaigns is largely dependent on the SRC, particularly the volunteers as well as funding support from businesses and local agencies. The SRC operates with oversight by City staff in the City Manager’s office, creating buy-in and support by the City Manager. The campaigns also rely on the Chamber of Commerce to involve businesses to distribute outreach materials and consider the provision of public containers.

The Bait Tank Cigarette Bin: Santa Cruz, CA

Save Our Shores, a 501(c)3 non-profit marine conservation organization in Santa Cruz, California, worked with the cities of Santa Cruz and Capitola to identify areas of high cigarette litter generation. In these areas, they installed Bait Tanks (see Figure 27), which are stainless steel cigarette receptacles with a shark fin and slogan that reads “Save some fish. Feed me butts.” Bait Tanks are designed to capture up to 2,000 cigarette ends and protect marine life. Eighteen Bait Tanks have been installed along the beaches, wharfs, and main streets in Santa Cruz and Capitola. Within a few months of installation a 77% decrease in cigarette litter was observed at the Santa Cruz Wharf and a 60% decrease was observed in Capitola.¹³ Save Our Shores and the cities promotes the Bait tanks through public service announcements (PSAs) and website outreach.

Figure 27. The Bait Tank Cigarette Receptacle



The City of Santa Cruz, with Save Our Shores, offers a \$200 to \$250 rebate program to help businesses buy, install, and maintain a Bait Tank on their property. Both the cities of Santa Cruz and Capitola have ordinances to ban smoking in public places, including beaches and parks.

Bait Tanks have also been installed in Monterey, Santa Monica, Florida, and Maine. Funding is said to be the largest barrier to the installation of new Bait Tanks.

¹³ Save Our Shores. *Pollution Prevention Bait Tanks Decrease Cigarette Litter an Average 70%*. December 2013. <http://www.saveourshores.org/news-events/documents/SOS-BaitTanks-decrease-litter.pdf>

*Cigarette Litter Abatement Fee: San Francisco, CA*

Other cities such as San Francisco have enacted fees to assist in recovering the costs of cleaning up cigarette ends. San Francisco's Cigarette Litter Abatement Fee (Ordinance 173-09) requires a \$0.20 per pack charge on all cigarettes purchased within city limits. When the ordinance was enacted in 2009 cigarette litter, including cigarette ends and packaging, accounted for 22% of litter on city sidewalks, streets, gutters, and public spaces and accounted for approximately \$6 million dollars in cleanup costs.¹⁴ Revenues for the fee are to be used toward cigarette litter cleanup; fee administration, collection and enforcement; and public outreach and education. Since 2009 the fee has generated approximately \$2.5 million dollars in revenue annually.¹⁵

CRV RECOVERY

CRV containers were found in 34% of garbage bins and 77% of recycling bins. The composition share of CRV containers in garbage was relatively small, with these items making up less than one-quarter of the total contents in all but four of the bins. CRV containers made up a larger share of the materials in recycling bins. For 10% of all recycling bins, CRV containers made up more than half of the total contents. For another 14% of recycling bins, CRV containers made up between one-quarter and one-half of the total contents.

Impacts to TMAs will be based on the selected location of recycling containers. New or improved containers in the downtown area (TMA 2C), and Civic Center (TMAs 2C and 2A), and parks (e.g. TMAs 1A, 1B, 2A, 2C, 3D, and 4A) throughout the city are ideal locations to improve CRV recovery and reduce overflow.

Improvements to Locks

To enhance the City's recovery of CRV containers, in addition to the previous recommendations to increase the number of recycling containers and improve container signage, the City is encouraged to use containers designed to prevent scavenging. While these containers are not expected to increase the overall recycling rate, they will increase recovery of CRV containers through public collection bins. Considerations when selecting containers designed to prevent scavenging include:

- **Anti-scavenging containers should include locks and openings that prevent the removal of recyclables.** The most common recycling container in the City (see Type D shown in Appendix G) currently has the appropriate design as the opening has a rubber liner to make it easy for materials to be deposited, but not removed.
- **Locks should be provided and used on all current and future recycling containers.** Many of the Type D containers, as well as the Type B downtown containers already have locks (see Appendix G), but these locks are not used.

¹⁴ City of San Francisco. Cigarette Litter Abatement Fee Ordinance 173-09. Adopted July 21, 2009.

¹⁵ Joshua Sabatini. "SF Leaders Working to Limit Tobacco Sales Permits as Cigarette Sales Rise." SF Examiner. December 18, 2013.



CRV Specialty Collection Containers

To supplement signage and containers-opening recommendations aimed at increasing CRV recovery, the City may consider adding specialty containers designed to target CRV and encourage the public to use recycling containers. CRV specialty containers should be targeted in areas with pedestrian volumes such as the downtown area and Caltrain station (TMA 2C), and Civic Center (TMAs 2C and 2A), and parks (e.g. TMAs 1A, 1B, 2A, 2C, 3D, and 4A).

One example of a specialty bin is the Keep America Beautiful and Coca-Cola Recycling Bin Grant Program that provides grant recipients with indoor or outdoor containers, including containers shaped like large bottles, as shown in Figure 28. Clearly identifiable containers that are labeled and designed to collect CRV may be an effective way to ensure the recovery of CRV containers. Grant recipients range from non-profit organizations, government agencies, schools, and religious organizations. The grant program also offers recycling bins with lids to capture single stream recyclables, not just CRV containers. Since 2007, the Coca-Cola Public Space Bin Grant program has placed more than 29,000 recycling bins in 380 communities in 48 states and the District of Columbia and the US Virgin Islands.

Figure 28. Keep America Beautiful/Coca-Cola CRV Container



The Volkswagen Fun Theory project in Sweden developed the “Bottle Bank Arcade” to improve collection of bottles, based on the theory that making an activity fun will promote behavior change. Using a collection container with a lighted arcade display and sound effects captured the attention of pedestrians. In one day, the arcade-style bin was used by nearly 100 people compared to a nearby conventional bottle bank container that was only used twice. No ongoing programs or long-term studies using or assessing the “Bottle Bank Arcade” were found.

NEW TECHNOLOGIES

Solar Compactors

At the request of the City, the Project Team researched solar compactor containers, which use solar power to compress the volume of material in containers. Vendors promote these compactors as a way to help prevent overflow while reducing the servicing schedule through compacting the waste. Vendors also sell an optional automatic alert system designed to notify maintenance staff when containers need to be serviced.

While solar compactor containers may reduce the number of scheduled collections and some case studies have reported cost savings, research also identified several drawbacks that reduced or negated the expected cost savings. A detailed report in 2010 by the Philadelphia City Controller found that the reduction in collection frequency was much less than expected—or previously published in case studies



describing Philadelphia's experience.¹⁶ The Philadelphia City Controller reported that the solar compactors did not reduce collection frequency as much as expected because maintenance staff did not typically skip servicing containers that were not full. Maintenance staff were also found not to use the monitoring system to identify and service containers that filled up before a regularly scheduled collection. In addition, the Philadelphia City Controller found that the solar compactors incurred higher maintenance costs than the City's previous wire basket containers in several areas:

- Repairs and routine maintenance not covered by warranty, because the device is a more complex piece of technology.
- Replacement when a container was damaged beyond repair.
- Servicing of the compactors, which was found to take more time than for wire baskets.
- Graffiti removal, because the solid-sided containers attracted more graffiti than wire baskets.
- Container relocation, which required more worker time and expertise than for wire baskets.
- Battery replacement.

Among other non-financial issues, the Philadelphia City Controller reported that the need to touch a handle to use the trash receptacle may prevent some people from using it—whether from a general concern about germs or from the presence of a substance such as dog excrement or grease on the handle.

In 2009, the King County (Washington) Parks and Recreation Division evaluated using solar compactors in a large park and natural area.¹⁷ The County estimated that the capital and servicing costs of using solar compactors in this park was \$2,500 to \$4,000 more per can than their current plastic waste receptacles. The analysis did not include routine maintenance and repairs. For King County, the benefits of reduced collection were limited because park maintenance workers serviced containers while doing other work around the parks, rather than making a separate trip to collect waste. However, the King County report suggested (but did not assess) that the solar compactor could potentially generate savings for agencies that make trips specifically to pick up waste or need to empty containers frequently.

Separately, maintenance staff in the Town of Los Gatos, California, found that because of the compaction, the containers can become too heavy to service.¹⁸

If the City is still interested in solar compactor containers despite these drawbacks, the City should:

- Contact jurisdictions that have installed this product to learn about their experience.

¹⁶ City of Philadelphia, Pennsylvania. Review of Purchase and Deployment of BigBelly Solar Compactors. Prepared by the Office of the Controller. July 2010.

¹⁷ King County Parks and Recreation Division, Washington. Review the Feasibility of Implementing Recycling and Solar Powered Trash Compaction in the King County Parks and Recreation Division System. August 2009.

¹⁸ Personal communication with Public Works Environmental Programs and Street Maintenance staff from the Town of Los Gatos. July 2013.



- Conduct an independent and thorough cost-benefit analysis based on the City's specific situation, taking into account at least the following costs: purchase, staff training, installation, relocation, servicing, routine maintenance, repair and potential replacement, and long-term maintenance.
- Develop procedures for and ensure a dedicated set of maintenance staff are identified and thoroughly trained to service and maintain the containers.
- Pilot test a small number of containers before making a large purchase. Areas that need daily collection and weekend service, such as Fremont Park (TMA 2C) and the outside of single-serve food establishments in the downtown area (TMA 2C), may be appropriate for a pilot test.

Other cities using solar contractors have paired the installation of containers with a public outreach campaign.

The City of Anaheim, California has installed 25 solar compactors for garbage and recycling in high pedestrian, using over \$235,000 in state grant funding. Compactors installed in areas frequented by children were decorated with cartoon-like monsters and slogans such as "Feed Me, I can eat trash all day long!" (see Figure 29). Additional bins were decorated with photos of people wearing t-shirts with phrases such as, "I ♻️ for Anaheim!" Decorated bins are designed to attract children and adults to use the containers.

The grant money also funded a poster contest and anti-litter coloring books. The Anaheim Public Works Department receives emails twice daily on bin fullness and the City is expecting to be able to decrease the frequency and cost of container collection, primarily based on the City's research of BigBelly Solar Compactors as no metrics specific to the City were reported to date.

Figure 29. City of Anaheim Solar Compactor Public Outreach



Bottomless Trash Bin

In Sweden, Volkswagen has sponsored a program called The Fun Theory, which theorizes that behavior change is more likely to occur when an activity is made fun. A Fun Theory project, in addition to the "Bottle Bank Arcade" described previously, transformed a standard public garbage container into "The World's Deepest Bin" by adding a sound effect to the container that made it sound like deposited trash was falling 2,000 feet down a deep well. In one day, the container collected almost 160 pounds of trash compared to a standard container nearby that only collected 90 pounds of trash. Pedestrians used the bin to discard their own trash and were also observed picking up litter surrounding the container in order to hear the sound effect. No cities were found to have piloted "The World's Deepest Bin" as an



educational campaign, and no studies we identified to assess whether the behaviors continued in the long term (after the novelty wears off).

New technologies are recommended to be piloted in TMAs with high pedestrian volumes such as the downtown area and Caltrain station (TMA 2C), the Civic Center (TMAs 2C and 4a), and parks (e.g. TMAs 1A, 1B, 2A, 2C, 3D, and 4A). These areas will serve the greatest number of pedestrians and encourage litter reductions in the area surrounding the container.

ESTIMATED COSTS AND RESOURCE NEEDS

CIGARETTE RECEPTACLES

Containers with closed receptacles for cigarette ends will cost the City \$425 per unit based on current City vendor prices. Staff time for a Parks Staff II/III employee to install each cigarette receptacles is estimated at two hours, for a cost of \$65 per container. Limited costs should be associated with the additional time needed to empty and clean the receptacles, likely 30 seconds to a minute, for a Parks Staff II/III employee depending on the level of cleaning needed. The total cost to purchase and install a cigarette receptacle is estimated at \$490.

IMPROVEMENTS TO LOCKS

Using the locks that exist on many of the current recycling containers is expected to add approximately one minute of staff time to servicing each container. The vendor of the most common type of recycling container in the City (see Type D shown in Appendix G) provided a price of \$12.50 per lock, which is supported by a brief internet search that showed new locks range from \$10 to \$20.¹⁹ The cost to install a new lock is estimated to take a Parks Staff II/III employee approximately ten minutes per container at a staff cost of \$5. The total cost to purchase and install a new lock is estimated at \$20 (with rounding) per container.

CRV SPECIALTY COLLECTION CONTAINERS

Specialty containers designed to attract pedestrian use such as the “Bottle Bank Arcade” or containers designed in the shape of CRV containers or with specialty signage would require Environmental Program staff time to research grant opportunities or other funding sources as well as maintenance staff time to install new bins. Environmental Program staff time for funding research and grant writing, averaged between the Environmental Programs Manager and Environmental Specialist salaries, is expected to take approximately 8 to 30 hours at a cost between \$300 and \$1,125. Container installation is estimated to take approximately two hours for one Parks Staff II/III employee, at a cost of \$65 per container. The total cost range to research, purchase, and install CRV specialty containers is estimated at \$365 to \$1,190 per container.

¹⁹ Personal communication with Ruben Leenders of The Fibrex Group, Inc. September 2013.



NEW TECHNOLOGIES

Based on the GSA federal schedule, the cost to purchase a solar compactor manufactured by BigBelly Solar is estimated to range from approximately \$3,500 to \$7,000 depending on type and number purchased, plus accessories and extra parts.²⁰ Prices may vary depending on the specific vendor chosen. The installation of a solar compactor is estimated to take one Parks Staff II/III employee approximately two hours at a cost of \$65. City maintenance costs for servicing solar compactors should remain the same, or be reduced, as frequency of pickup may be reduced for a Parks Staff II/III employee. The total cost range to purchase and install a solar compactor is estimated at \$3,565 to \$7,065.

TIMELINE

Proposed Recommendation	Timeline
Install cigarette receptacles	July 1, 2015
Lock recycling containers that currently have locks	August 31, 2014
Purchase and install locks on recycling containers that do not currently have locks	December 31, 2014
Research and install CRV specialty containers	July 1, 2015
Decide whether to pursue solar compactors or other technologies. Pair new technologies with public outreach.	July 1, 2015

²⁰ BigBelly Solar. Solar-Powered Waste and Recycling Stations: General Services Administration Authorized Federal Supply Schedule Price List. 2009–2014.



Summary

The seven recommendations in this Strategic Plan have been evaluated and proposed based on feasibility, planning-level cost estimates, and expected effectiveness in reducing litter in TMAs. The City's next steps are to review the recommendations, including proposed timelines and planning-level cost estimates, and prioritize them based on available funding and staff. For prioritized recommendations, the City should also develop more detailed, implementation-level cost estimates, which will depend on more extensive input from the City's franchised hauler and maintenance staff, the results of the container inventory update, and the level at which recommendations are implemented. Outreach and litter cleanup activities in particular can be scaled to the City's available resources.

Timelines in this Strategic Plan were developed in 2013 to begin the implementation of the lower cost activities and the activities that will inform implementation of other recommendations following the July 1, 2014 adoption date of this Strategic Plan, reserving the higher cost activities for 2015–2017. However, if the City has resources available, earlier implementation of activities such as repairing damaged containers or installing new containers could reduce litter faster.

Together, the recommendations presented in this plan are expected to reduce the amount of litter entering the City's storm drain system and help the City meet its Short-Term and Long-Term Plan goals. A matrix of proposed timeline and impacts to trash loads in TMAs, for each recommendation is presented in Table 12. It is recommended that the City further develop costs by analyzing the recommendations that will be most effective in reducing litter in prioritized TMAs and available City funding and staff resources over the duration of this Strategic Plan. The proposed recommendations for this Strategic Plan are based on the available information from City staff, vendors, and research conducted in 2013.



Table 12. Summary of Proposed Recommendations, Impacts to Trash Management Areas, and Timeline for the City to Consider

Proposed Recommendation	Trash Management Area (TMA) Impacted	Timeline
1. Relocate Existing Containers		
Relocate Existing Containers	2A, 2C, 3B, 4A, and 3D and additional TMA(s) to be determined based on new location selection	August 31, 2014
2. Update Container Inventories		
Develop an inventory of City-serviced containers	All TMAs with City containers	December 31, 2014
Encourage or require the hauler to update inventory of hauler-serviced containers (unless this action requires an amendment to the Franchise Agreement)	All TMAs with hauler containers	July 1, 2015
3. Implement Inspection and Monitoring Program		
Develop a tracking and reporting system to support monitoring	All TMAs with containers	December 31, 2014
Begin monitoring City-serviced containers	2A, 2C, 3A, 3B, 3D, 4A, 4F, and other TMAs with City containers	January 1, 2015
Encourage hauler to report containers with litter or overflow problems	All TMAs with hauler containers	August 31, 2014
Begin monitoring city streets and parks for areas that need new containers	All TMAs	January 1, 2015
Begin auditing hauler-serviced containers	2A, 2C, 3A, 3B, 3D, 4A, 4F, and other TMAs with hauler containers	January 1, 2015
4. Increase Litter Cleanup		
City maintenance staff to pick up all litter around City-serviced public containers.	All TMAs with City containers	August 31, 2014
Request meetings with transit organizations to determine responsibilities for litter cleanup at transit sites.	Primarily 2C and other TMAs with transit sites	July 1, 2016
For transit sites the City is responsible for, begin weekly litter cleanups as soon as practical given existing contracts and franchise agreements.	All TMAs with transit sites	August 31, 2014
Begin outreach to businesses with parking lots.	All TMAs with businesses with parking lots	July 1, 2015
Implement hand-sweeping, if selected.	Primarily 2C and other TMAs prioritized	July 1, 2015
Implement commercial sweeping equipment, if selected.	Primarily 2C and other TMAs prioritized	July 1, 2015



Proposed Recommendation	Trash Management Area (TMA) Impacted	Timeline
5. Repair Damaged Containers and Improve Signage		
Repair damaged bins and replace missing lids.	Missing Lids: 1B, 2A, 2C, 3A, 3B, 3D, and 4A	August 31, 2014
Add labels to recycling containers that have no or illegible signage. Add “garbage only—no recyclables” labels to garbage containers that are paired with recycling bins	All TMAs with containers	December 31, 2014 or when new recycling containers are installed.
6. Add New Containers or Change Container Type		
Install new public containers, add recycling containers, and place Recology carts on weekends in high-litter-generation areas.	Primarily 2C and other TMAs prioritized	July 1, 2015
Upgrade or replace the hinged, metal lids on recycling containers in the downtown area to enlarge the opening. If this action would require replacing containers or substantial costs, delay implementation as needed.	2C	July 1, 2016
7. Implement Specialty Bins and Consider New Technologies		
Install cigarette receptacles	TMAs with businesses and transit areas: Primarily 2C and other TMAs prioritized	July 1, 2015
Lock recycling containers that currently have locks	All TMAs with recycling containers installed	August 31, 2014
Purchase and install locks on recycling containers that do not currently have locks	All TMAs with recycling containers installed	December 31, 2014
Research and install CRV specialty containers	Primarily 2C and 2A (Downtown and Civic Center), parks (TMAs 1A, 1B, 2A, 2C, 3D, and 4A), and other TMAs prioritized	July 1, 2015
Decide whether to pursue solar compactors or other technologies. Pair new technologies with public outreach.	2C and 2A (Downtown and Civic Center), parks (TMAs 1A, 1B, 2A, 2C, 3D, and 4A), and other TMAs prioritized	July 1, 2015



Appendices

- Appendix A** Detailed Methodology
- Appendix B** Hauler-Provided Inventory and Service Information for Public Containers
- Appendix C** City of Menlo Park Public Litter Container Field Survey Plan
- Appendix D** City of Menlo Park Public Litter Container Survey Results and Recommendations for Improved Container Management (Excel file)
- Appendix E** City of Menlo Park Trash Generation Rate and Trash Management Area Map
- Appendix F** City of Menlo Park 2013 Staff Salaries
- Appendix G** Types of Existing Public Litter Containers